The 2010 Pastoral Industry Survey - Northern Territory Wide

Northern Territory Government

Department of Primary Industry and Fisheries

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To the reader

It is with great pleasure that I write the foreword for this very important document.

The pastoral industry survey provides a baseline of information of great value to existing businesses, prospective interests and those engaged in research, development and extension.

The survey has captured approximately 50% of the NT pastoral industry members and has required considerable amount of work by departmental staff to gather, collate and deliver this work in a clear and useful form.

The report provides a good insight into the demographic, operational, economic and environmental elements of the industry and the strategies adopted to meet the many varied opportunities and challenges.

I am happy to recommend this document as an indicator to the health and condition of the NT beef industry, its land, people and enterprises.

David Warriner

NTCA President

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Acknowledgements

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The 2010 Northern Territory-wide Pastoral Industry Survey was based on the 2004 version:

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Executive summary

The previous NT Pastoral Industry Survey of 2004 was the first comprehensive report on the industry's practices and plans that had been collected since the early 1980s. The results attracted great interest and showed a remarkable transformation of the industry over that 20 year period. It was therefore agreed that the survey would be repeated approximately every five years to monitor the progress of the industry as it evolves. This survey report is based on the 2010 calendar year. While the changes between 2004 and 2010 have been less dramatic than those reported in 2004, the data shows a steady development in the industry with significant investment in infrastructure and improved management.

The other important reason for publishing this survey report is that its results are a more accurate representation of the industry because this time the data has been weighted by size of property in terms of adult equivalents (AE) or land area, while in 2004 the survey data was based purely on the number of responses. Direct comparisons between 2010 and 2004 should therefore be treated with some caution.

This survey was not easy to carry out or to interpret its results due to the temporary suspension of the live export trade to Indonesia in June 2011 in the middle of the data collection period. Although the data presented refers to the year before, this action had a profound effect on industry confidence and attitudes, as most of the interviews were conducted after the suspension.

Out of the estimated 236 pastoral businesses in the NT, 127 were surveyed (54%). This sample accounts for about 1.4 million (67%) of the NT's estimated 2.1 million cattle, and about 355 000 km^2 (53%) of the estimated 675 000 km^2 of NT's land under pastoral management. The sampling intensity was approximately equal across each of the four regions. All the surveyed businesses had a minimum of 300 adult cattle.

One hundred and twenty seven pastoral businesses were surveyed, accounting for 1.4m cattle and 355 500 km^2 of land under pastoral management

The survey found that the average size of a cattle property in the NT was 2794 km^2. The average property size varied considerably between regions from 497 km^2 in the Top End to 6653 km^2 on the Barkly. Paddock size also varied significantly between regions from an average of 29 km^2 in the Top End to 377 km^2 in Alice Springs, with an overall average of 100 km^2 across the whole NT. Eighty five per cent of the surveyed area was utilised for grazing.

Based on the number of surveyed properties across the NT, ownership was 69% private, 22% company and 8% Indigenous. The company-owned properties were larger; however, the companies managed 52% of the surveyed NT cattle on 37% of the land while private owners managed 44% of the cattle on 55% of the land and Indigenous owners managed 4% of the cattle on 8% of the land. There were considerable regional differences. Cattle numbers under company ownership, for example, were lowest in Alice Springs (2%) and highest in the Barkly (79%), with the Top End (32%) and Katherine (48%) more evenly split.

In 2009-10, companies spent more per property on development than did private or Indigenous-owned businesses; however, once property size was taken into account, that was no longer the case. Overall, NT properties spent an average of $21 per AE on development, from a low of $13 per AE on the Barkly to a high of $49 per AE in the Top End.

The data on water points for stock was difficult to interpret. Producers concentrated on developing water points on their more productive land. Therefore, average distance to water is not always meaningful. The responses however, indicated that there were still large areas of pastoral land that were poorly watered and there was still considerable scope for improving production from future water point development.

Over the whole NT, the median length of time under current ownership was 12 years and under current management six years. This varied considerably between regions, with the Katherine and Barkly regions having a fast turn-over of owners and managers, and the Alice Springs region showing much more stability.

The NT average property herd size was 11 029 head but this was skewed by the large herds on the Barkly. Overall, the most common herd size was 2000 to 5000 head for all regions except the Barkly where most properties had more than 20 000 head. Overall, the industry estimated that they had increased their cattle numbers by 10% since 2004.

Detailed information was collected on turn-off and markets. According to the survey results, 52% of sale cattle were turned-off to the live export trade and the rest were sent elsewhere in Australia.

Producers were asked about their strategies for marketing heavier cattle after Indonesia started to enforce the 350-kg import restriction in early 2010. Almost all producers in the Top End and Katherine regions were affected by this change and they had responded with a wide variety of strategies, which are discussed in this report.

Forty eight per cent of NT cattle were described as Brahman and 47% as different types of crossbred or composite cattle, most of which had some tropical adaptation. Only 5% were described as purebred temperate breeds.

The survey recorded significant interest in objective selection methods, with 29% of bulls being purchased using estimated breeding values (EBVs). Most properties sourced their bulls from Queensland studs. There was also considerable attention given to bull testing, particularly prior to purchase, when 29% of the bulls were subjected to a full bull breeding soundness examination (BBSE) and 37% were semen tested.

Seventy per cent of producers carried out some pregnancy testing. Only 20% of producers pregnancy-tested all cows; however, this was higher on the Barkly (54%) and in the Top End (44%). Overall, pregnancy testing only dry cows was the most common strategy (33% of properties). Some form of herd performance recording was practised by 52% of properties while another 11% were planning to do so.

Continuous mating was the most common breeding strategy. Only 9% of NT breeding cows were control-mated, though this was higher in heifers (32%). The difficulty of good bull control was stated as the main reason for not adopting controlled mating.

The average weaning weight across the NT was 187 kg in the first round and 160 kg in the second round. Producers estimated their minimum weaning weight to average 124 kg in the first round and 112 kg in the second round. Over 80% of weaners received some form of weaner education and 38% of properties segregated weaners on weight to in order to carry out different feeding strategies.

The survey asked a number of questions about production parameters, such as mortality and weaning rates in different classes of livestock. However, it is acknowledged that these are hard to assess accurately on properties and are open to different interpretations. In some cases, producer estimates had declined since the 2004 survey, but this is probably attributable to increased knowledge and therefore more realistic estimates rather than an actual decline in herd performance.

Eighty per cent of NT properties had some sort of mineral supplementation, with 35% supplementing year round, 80% supplementing during the dry season and 62% supplementing during the wet season. Twenty one per cent of surveyed properties produced hay, mostly in the Top End and Katherine regions and used much of the hay on their own properties.

Data on animal health treatments showed significant differences between regions. Vaccination against botulism was the most common disease control measure on 84% of properties while 50% of properties vaccinated against vibriosis.

Fifty three per cent of properties used hormonal growth promotants (HGPs) with the highest use being in the Barkly region (85% of properties) and the lowest in the Alice Springs region (24%).

Data on grazing management showed that most producers assessed their feed availability regularly throughout the year through a combination of formal and informal methods. Most had a strategy for adjusting stock numbers in the dry season.

Producers in the Top End, Katherine and Barkly regions preferred to design infrastructure around a maximum distance to a water point of 4.5 km or less, while Alice Springs producers preferred a more modest distance of around 9.3 km.

Katherine and Barkly producers in particular anticipated an increase in carrying capacity of up to 22% by 2015 and 31% by 2020 based on their plans for infrastructure development. Alice Springs producers anticipated a slight decrease in short-term carrying capacity because they were experiencing a sustained period of good seasons, which could not last. Overall, NT producers predicted an increase in carrying capacity of 17% by 2015 and of 25% by 2020.

Sixty six per cent of producers burnt part of their properties for management purposes in 2010, mainly to mitigate wildfire, control grazing and remove rank pasture. Based on producer estimates, 11% of the surveyed area was burnt by wildfires and 8% was burnt deliberately in 2010.

Areas of improved pastures had been established on 55 of the 127 surveyed properties (43%) mostly in the Top End and Katherine regions. The overall area of improved pasture was small (5404 km^2 or 1.5% of the pastoral area). Most of these areas of improved pasture (58%) were of low input where seed was broadcast into native pastures. About half of the producers in the Top End and Katherine regions intended to increase their areas of improved pasture in the next three years.

Most producers were concerned about weeds and estimated that between 7% (Barkly) and 26% (Top End) of their properties were affected by weeds. Eighty three per cent of producers controlled weeds, annually spending a median of $5000 per property on weed control ($3.90 per km^2). The amount spent on weed control varied significantly between regions and was particularly high in the Top End. Pest control was a significant issue on most properties, particularly wild dogs (63% of properties).

Staff training was undertaken on 87% of properties, with most of this being informal, on the job training. Companies were far more likely to provide formal training, either accredited or non-accredited. Data was collected on sources of information and the uptake of different publications. Over 80% of producers sourced information through email or the Internet.

Seventy four per cent of producers had prepared some form of documented management plans, mostly on financial or business management. Human resources plans were in place on 21% of properties, natural resource management plans on 25% and OH&S plans on 42%. Sixty eight per cent of producers used production or financial benchmarks to guide management and 79% stated that they used benchmarks to guide their natural resource management.

Forty one per cent of NT pastoralists had other sources of income apart from cattle, mostly in the Top End (65% of producers). The Barkly region had the lowest, with only 23% of producers having an alternative source of income.

The major hurdles to manage NT pastoral businesses were staff availability (24%), road conditions and poor road access (19%), markets (19%), cost of production (17%), seasons (13%) and government regulations (9%). In terms of threats to their long-term sustainability, producers considered market issues to be the most important (42%), followed by government regulations (27%) and cost of production (22%). The emphasis on some of these factors clearly reflected the timing of the survey, following the 2011 temporary trade suspension to Indonesia.

How the survey was conducted and considerations for using the information

This survey follows the 2004 Pastoral Industry Survey. Due to the level of interest in the results of that survey, it was agreed with the industry to repeat it after five years to monitor changes.

Survey forms were emailed, mailed or hand-delivered to producers. Most of the surveys were carried out by extension officers face to face with producers at convenient locations, including on their properties and at DPIF offices.

All the surveyed properties had 300 or more head of livestock. Where producers managed more than one parcel of land, the survey was completed on the business unit rather than on each individual property. A total of 127 pastoral enterprises were surveyed out of an estimated 236 businesses in the NT (54%). This sample of stations accounts for approximately 1 400 718 cattle out of an estimated NT total of 2 078 000 (67%) and 354 801 km^2 of land out of approximately 674 619 km^2 under pastoral management (53%). A breakdown by region is provided in Table 1.

Data collection began in January 2011 with an initial aim of completion by late 2011. However, in June 2011, the live export trade to Indonesia was temporarily suspended after footage of cruelty to animals in some Indonesian abattoirs was aired on national television. Although the suspension was lifted a month later, the episode left a legacy of uncertainty and a decline in industry confidence. No survey interviews were conducted while the trade suspension was in place and the majority were carried out towards the end of 2011 and in early 2012. Some interviews were conducted prior to, and some after, the trade suspension. It was decided to focus the survey questions on the 2010 calendar year (prior to the trade suspension). Data collection was completed in March 2012.

The context and timing of the survey is therefore important when considering the results, especially for those questions related to development plans and issues facing the long-term sustainability and profitability of businesses, all of which could be impacted upon by the change in industry confidence. The effect of market conditions had a particular impact on the northern half of the NT. Data collection from the Alice Springs region was also disrupted by a particularly difficult wildfire season in 2011-12 when over 80 000 km^2 or 40% of the pastoral area was burnt.

Since properties vary greatly in land area and cattle numbers, the results have been weighted to provide the most appropriate representation of the industry. Data concerned with cattle production has been weighted on the total AEs per property and data related to land management on land area, while questions about business management or staff were not weighted. Where producers were not able to provide cattle numbers, regional estimates were used based on herd models used in the regional Beef Cooperative Research Centre templates. Total AEs were calculated for each property and were used to weight questions regarding cattle management where relevant.

Care must therefore be taken when drawing direct comparisons with the 2004 survey, as those results were not weighted.

Median figures rather than averages have been used in this report. The median of a group is the half-way point at which there are as many values above as below. The median provides a better representation of the most common or typical value.

Not all properties responded to each question. The data has been summarised to reflect the number of respondents to each question, rather than to the survey overall.

This report contains many results where the percentages add up to more than 100. This occurs where people have responded to more than one variable; for example, mustering where they may have used horses, helicopters and/or motorbikes.

Responses collected during this survey are completely anonymous and remain the property of the producers. The database is maintained by DPIF Pastoral Production staff at Katherine Research Station. Any requests for further examination of the data must be approved by the Executive of the Northern Territory Cattlemen's Association (NTCA).

Table 1. The number of producers and the area surveyed according to region

Region	Total producers identified as meeting criteria	Total surveyed	Producers surveyed (%)	Land actively managed for pastoral purposes (km^2)	Total area surveyed (km^2)	Pastoral land surveyed (%)
Alice Springs	60	31	52	237 266	117 756	50
Barkly	28	13	46	168 662	86 488	51
Katherine	108	63	58	234 227	140 609	60
Top End	40	20	50	34 464	9948	29
NT-wide	236	127	54	674 619	354 801	53

Introduction

The cattle industry is NT's predominant primary industry earning $325m in 2010-11, approximately 57% of the total agricultural production and one of the most important export industries. The 217 pastoral leases comprise 46% of the NT's land mass and there are also significant cattle numbers on Indigenous land and other forms of tenure. In 2010, the industry managed approximately 2.1 million beef cattle on over 680 000 km².

The 2010 NT Pastoral Industry Survey aims to assist the industry as a benchmarking and planning tool. Its objectives were to:

1. Document the state of the cattle industry in the NT to enable the government and the industry to better assess the benefits of past and current research projects.
2. Collect information on industry needs so DPIF and other groups, such as the NTCA and Pastoral Industry Advisory Committees can use it to set priorities for action.
3. Determine the most effective ways to provide relevant information to producers in each region and initiate or improve communication between DPIF and cattle producers.
4. Provide the industry with up-to-date information on best management practices, and prioritise and plan for future research and extension activities.

This report summarises the results from the whole NT. Separate reports focus in more detail on each of the four regions: the Top End, Katherine, Barkly and Alice Springs.

The Survey region

Figure 1 shows the four regions covered by this survey. Each region is divided into districts, except for the Top End.

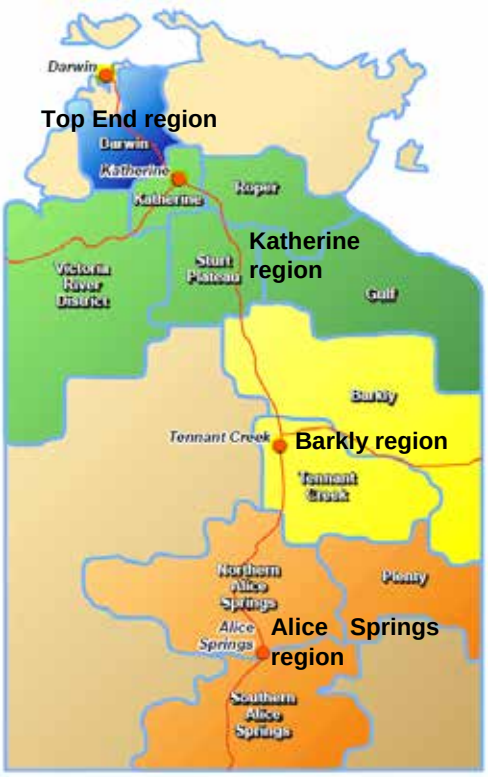


Figure 1. Map of the Northern Territory showing the survey regions and districts

Soils and vegetation

The Alice Springs region is divided into three districts: Northern, Plenty and Southern. The main land types that are useful for production include open woodlands, Mulga shrublands, Gidgee woodlands, calcareous shrubby grasslands, chenopod shrublands and alluvial plains of major rivers.

The Barkly region is divided into two districts: Tennant Creek and Barkly. The land types of the Tennant Creek district have variable vegetation over light textured soils. The Barkly district is typified by treeless, slightly undulating black cracking clay plains dominated by perennial Mitchell grass and annual Flinders grass.

The Katherine region is divided into five districts: Katherine/Daly, Roper, Gulf, Victoria River and Sturt Plateau. The Katherine/Daly district is typified by large areas of rugged hills and ridges, with the most pastorally important land being made up of red earths with tropical tall grasses. The Roper and Gulf districts are typified by soils that are shallow, coarsely textured and stony, and vegetation of open woodland dominated by *Eucalyptus*. The Victoria River district (VRD) can be divided into two land types: rugged and hilly with valleys of tropical tall grass and more undulating country of plains dominated by Mitchell grass. The Sturt Plateau is characterised by red and yellow earths with vegetation of *Eucalyptus*-dominated woodlands, and an understorey of ribbon grass, perennial sorghum and kangaroo grass.

The Top End region, with its poor soils and high rainfall, produces poor quality native pastures. Consequently, cattle production relies on improved pastures and floodplain native pastures.

Regional differences

There are a number of well-established physical, historical and social differences that characterise the cattle industry in each of the four regions.

Rainfall decreases in amount and reliability from the north to the south of the NT.

The Top End and Katherine regions have a reliable monsoonal climate. High annual rainfall, above 1000 mm, results in poorer quality native pastures as the plants mature quickly and nutrients are diluted. As a result, production north of Katherine is based mainly on improved pasture and floodplains, with native pastures used strategically for part of the year or for particular animal classes.

Districts such as the Barkly and southern VRD that receive an annual rainfall of about 500 mm have long been considered the premier cattle breeding areas. These areas still contribute the bulk of the cattle produced, but improved management over the past 20 years has transformed the productivity of other areas, such as the Sturt Plateau, which were developed later.

Rainfall in Central Australia is extremely variable. In good seasons this region is capable of exceptional cattle performance, but droughts are common. Experienced Central Australian producers have developed management systems that are appropriate for their highly variable climate.

The simple picture of NT markets is that the Top End and Katherine regions mainly target the South-East Asian export trade predominantly with *Bos indicus* cattle, the Alice Springs region supplies the domestic market to the south with *Bos taurus* cattle and the Barkly region sends store crossbred cattle to supply chains in Queensland. While this was a valid summary in 2010, there are many exceptions and producers are actively exploring alternative markets.

The four regions have also established different patterns of ownership. The Alice Springs region is dominated by family-owned properties, the Barkly region by company-owned properties and the Katherine region by a combination of family, small corporate and large company-owned properties. The majority of Top End properties are privately-owned and managed, although there are also a significant number of company-owned properties. There are also a substantial and increasing number of cattle on Indigenous land and on properties under Indigenous ownership.




Overview of the pastoral industry in 2010

The NT pastoral industry in 2010 was in generally good shape, particularly in contrast to the market problems of 2011 and the decline in industry confidence in the years that followed.

For most of the NT, annual rainfall had been above average. This was particularly marked in the south. Alice Springs Airport recorded 770 mm in the 2010 calendar year, almost up to its record of 782 mm. Barkly had a generally good 2009-10 wet season, with some areas getting 30 to 45% above their long-term average. The northern Barkly around Newcastle Waters was the exception, getting 20% less than its average rainfall. The Katherine region had a generally average wet season rainfall in all districts except in the Gulf where it was significantly lower than average. The Top End had average to above average rainfall in 2009-10. The good season in the southern half of the NT subsequently resulted in one of the biggest bushfire seasons on record. An estimated 40% of the Alice Springs pastoral area and 33% of the Barkly was burnt in 2011.

Live export was very strong in 2010 with 295 605 cattle being exported through the Port of Darwin, including 272 749 NT cattle. This was 51 709 less than the record number in 2009 (32 069 less in terms of NT cattle) but still more than any of the years between 2003 and 2008. Indonesia dominated the market taking 92% of the cattle exported through Darwin. Export prices for steers ranged between $1.85/kg and $2.10/kg during the year, which was an average of 8% above the year before and represented an average increase of 3.5% per year since the 2004 survey was conducted. Prices elsewhere were also favourable reflecting strong export markets and good seasonal conditions across most of Australia.

In early 2010, the Indonesian Government commenced the strict enforcement of the 350-kg maximum weight limit. This had serious implications for the northern industry, particularly affecting the value of cull cows.

The effect was not felt as strongly in 2010 as it would be later on, partly because for the first few months the 350-kg limit was interpreted as the average for the shipment and not applying to each individual animal. Furthermore, excellent seasonal conditions in Central Australia allowed a large number of cull cows to be agisted and fattened there for domestic markets.

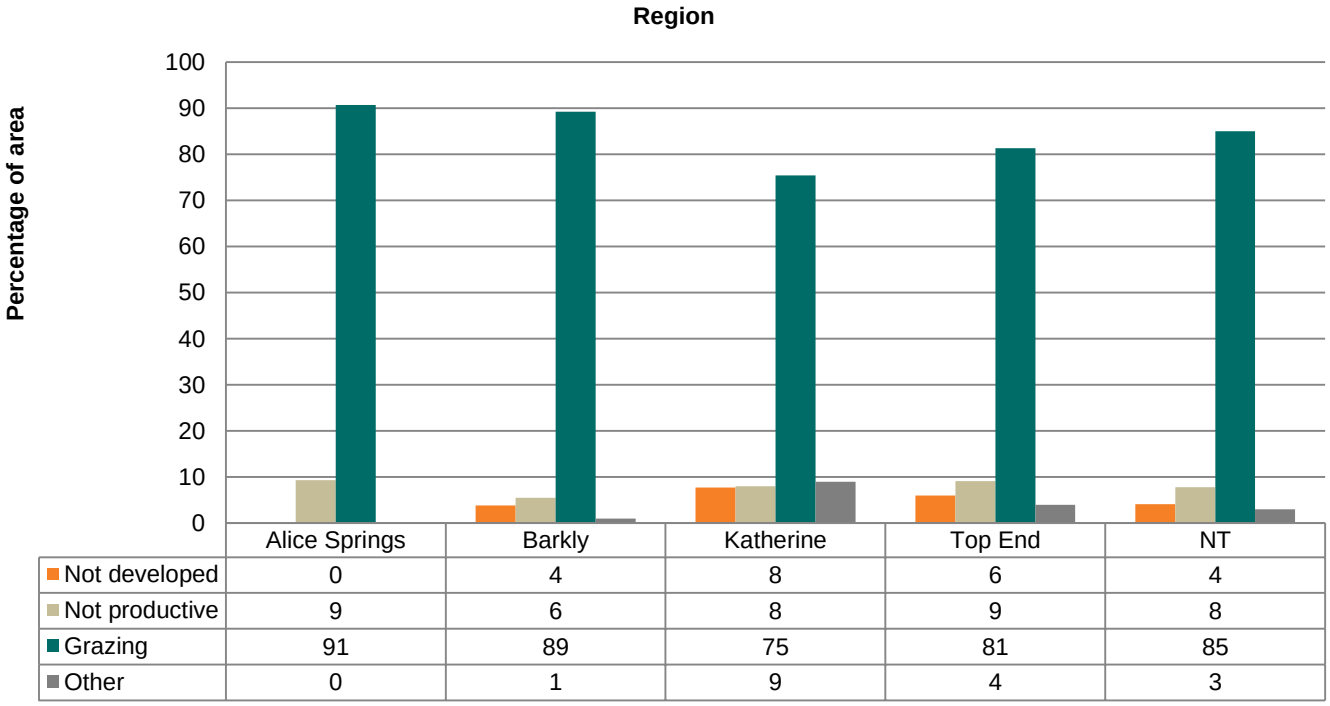
Station size

The average property size in the surveyed area of the NT was 2794 km² (Table 2). Larger properties characterised the Barkly and Alice Springs regions. Producers were asked to provide an estimate of the percentage of the property they currently considered to be grazed area. The Alice Springs region had the highest proportion of surveyed area utilised for grazing at 91% and the Katherine region had the lowest at 75%.

Figure 2 shows that the major reason for not grazing parts of the property was that these areas were considered to be not productive. 'Other' in the Katherine region represented land that was not grazed but was not classified; in other regions 'other' typically represented hay production, horticulture or tourism. Opportunities appeared to exist for further development in the Katherine, Barkly and Top End regions.

Table 2. Average property size in each region

Region	Average size (km^2)	Grazed (%)
Alice Springs	3 799	91
Barkly	6 653	89
Katherine	2 232	75
Top End	497	81
NT-wide	2 794	85



	Alice Springs	Barkly	Katherine	Top End	NT
Not developed	0	4	8	6	4
Not productive	9	6	8	9	8
Grazing	91	89	75	81	85
Other	0	1	9	4	3

Figure 2. Percentage of the surveyed area used for grazing, not developed and considered not productive

Current infrastructure

Tables 3 and 4 show the level of infrastructure development in each of the regions. A clear difference exists due to the scale of average property sizes in the regions, with the Alice Springs and Barkly regions characterised by larger paddocks and higher numbers of permanent yards.

The number of water points is also a function of property size, but in addition, reflects the increasing number of natural water points from the south of the NT through to the wetter Top End.

Seventy two per cent of Alice Springs producers capitalised on the opportunity to use trap yards to aid their mustering, with a smaller proportion in the other areas (33% in the Katherine region, 31% in the Barkly region and 25% in the Top End region) stating they used trap yards to muster.

Table 3. Median number of paddocks and their size according to region

Region	Median number of paddocks	Median paddock size (km^2)
Alice Springs	8	377
Barkly	23	218
Katherine	16	70
Top End	15	29
NT-wide	15	100

Table 4. Median number of different types of yards and percentage of properties using them

Region	Permanent yards per property	Properties using portable yards	Properties (%) using trap yards	Trap yards per property using them
Alice Springs	9	69	72	11
Barkly	13	54	31	3
Katherine	2	67	33	10
Top End	1	35	25	2
NT-wide	3	61	41	10

Water point development is a careful balance between optimising carrying capacity and ensuring increased production will pay for the cost of development.

Table 5 demonstrates the large range in area per water point between the regions and indicates a combination of the inherent productivity of the land being developed and the level of development that has occurred in the regions. The grazed area per water point was calculated by dividing the total grazed area on each property by the number of water points. This is a simplistic measure of development as intensity of development is actually guided by the productivity of the land, so an individual property is likely to intensify development on its most productive areas. However, considering that a 360 degree grazing radius of 3 km is equal to a grazing area of 28 km^2, the data indicates there was potential scope for further development, particularly in the Barkly and Katherine regions. Producers could use more water points to either increase stock numbers or to spread out existing stock and thereby reduce utilisation rates and improve individual animal performance. In the Alice Springs region where land type carrying capacities are lower due to less rainfall and more seasonal variability, the figure of 159 km^2 per water point may reflect an unwillingness to develop more water points due to a lack of economic return.

Table 5. Median number of natural and man-made water points

Region	Permanent natural waters	Man-made water points	Grazed area per water point (km^2/point)
Alice Springs	4	28	159
Barkly	6	80	72
Katherine	7	43	66
Top End	12	12	24
NT-wide	7	26	128

Station improvements

Producers were asked what station improvements they had completed in 2009 and 2010 to provide an indication of the type of infrastructure development that had been occurring in the NT (Table 6).

Water point installation was the most common development in all regions, with 67% of producers across the NT investing in this over the 2009-10 period, particularly in the Barkly and Katherine regions. Almost half of all NT producers carried out some paddock subdividivison during these years.

Drafting yards were the third most common form of development, with 62% of Barkly producers indicating they had invested in drafting yards.

Table 6. Percentage of properties carrying out infrastructure development in 2009 and 2010

Improvements	Region				
	Alice Springs	Barkly	Katherine	Top End	NT-wide
Water point development	52	85	77	45	67
Paddock subdivision	23	46	54	65	48
Drafting yards	42	62	33	25	37
Roads	45	31	25	25	31
Accommodation	6	38	26	55	27
Laneways	10	15	28	35	23
Sheds	23	31	15	40	23
Boundary fencing	16	23	20	15	19
Other	16	38	16	10	18
Trap yards	19	0	15	5	13
Telemetry	0	0	2	0	1

Producers were asked to provide an estimate of the total cost of capital development undertaken in 2009 and 2010. The median expenditure combined over the two years by NT producers was $200 000, or $21 per AE as shown in Table 7. Companies spent more money per property on capital development than other ownership types, but generally less money per AE.

Table 7 shows that the total amount of expenditure per property was greatest in the Barkly region; however, when the expenditure per AE was calculated, it showed that the greatest intensity of development had occurred in the Top End and Katherine regions.

Table 7. Average estimates of capital development expenditure during 2009 and 2010

District	No. responses	Median expenditure ($)	Median expenditure per AE ($/AE)
Alice Springs	23	60 000	20
Barkly	11	500 000	13
Katherine	40	200 000	27
Top End	16	250 000	49
NT-wide	86	200 000	21

Ownership

Management structure

Table 8 shows that the most common ownership type in the NT was owner-manager (40%), where the owner also managed the property. After this, the most common ownership structure of NT properties was privately-owned with an employed manager (private owned-manager), and corporate company-owned with an employed manager (company-manager), each representing 22% of properties. Producers running cattle on leased country (private-lessees) and those agisting cattle on private property (private-agister) made up only a small part of the survey participants.

Company-owned properties had the largest area of managed land (132 334 km^2) at an average property size of 4726 km^2.

Table 8. Average property size, total area of land and percentage of properties under different ownership types

Ownership type	Average size (km^2)	Total area of land (km^2)	Properties (%)
Owner-manager	2096	106 921	40
Company-manager	4726	132 334	22
Private owned-manager	2725	76 296	22
Indigenous owned land	3011	30 106	8
Private-lessee	1358	8149	5
Other	261	521	1.5
Private-agister	237	474	1.5

Table 9 shows the percentage of cattle by each ownership type according to region. Fifty two per cent of all NT cattle were owned by corporate companies. This is particularly true in the Barkly region where 78% of all cattle were company-owned, but is also significant in the Katherine region (48%). Cattle in the Alice Springs region were predominantly run by privately-owned enterprises, either by owner-managers or by employed managers. Only two surveyed enterprises, both in the Katherine region, were private-agistees accounting for less than 0.5% of the cattle surveyed.

Table 9. Percentage of cattle managed by various ownership structures

Region	Company-manager	Indigenous-owned	Owner-manager	Private-agistee	Private-lessee	Private-manager
Alice Springs	2	7	50	0	0	41
Barkly	78	0	3	0	0	18
Katherine	48	7	25	0	3	16
Top End	32	7	19	0	1	41
NT-wide	52	4	20	0	1	22

Figure 3 displays the percentage of properties, cattle and land in the NT under different ownership types.

Figure 3. Percentage of properties, cattle and land according to ownership type

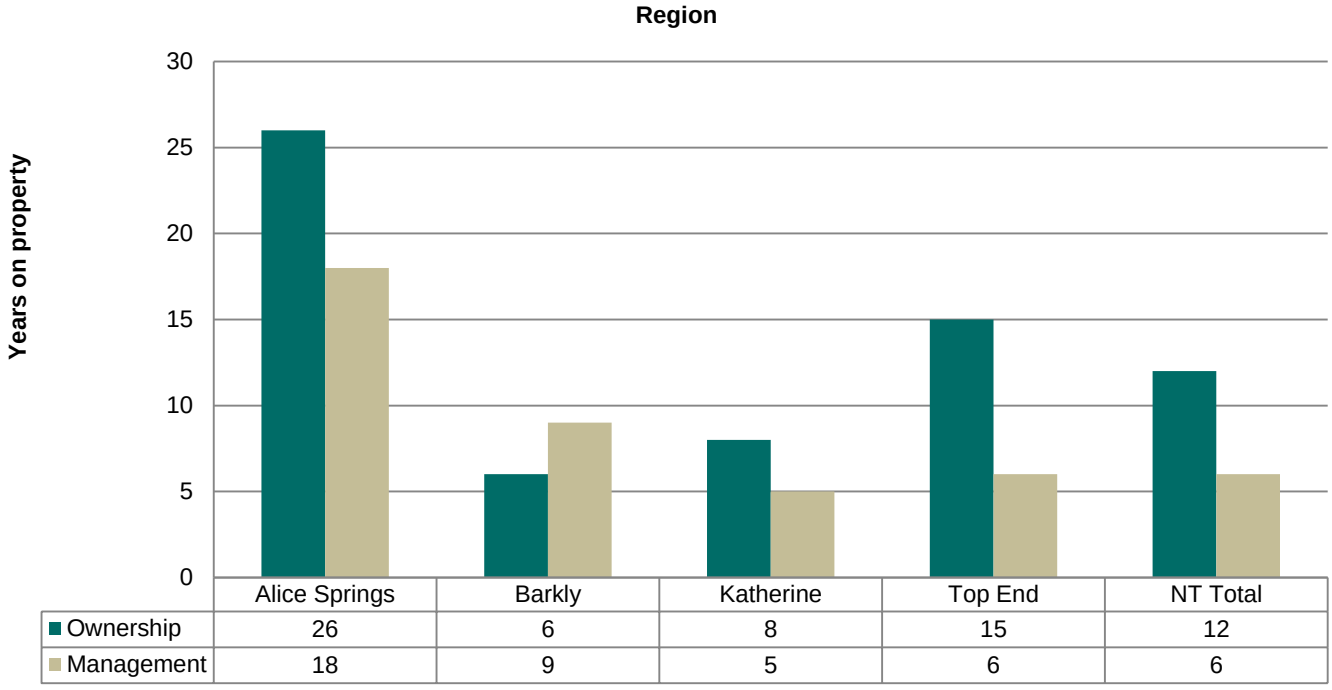
NT producers were most likely to be operating on an individual property basis (61%) (Table 10). However, some producers operated an integrated production system across more than one property. Company properties were more likely to have an integrated system. The Barkly region, which had the highest proportion of company-owned properties, also had the highest percentage of properties with an integrated production system.

Table 10. Percentage of properties that run as integrated or stand-alone enterprises

Region	As part of an integrated production system	Stand-alone
Alice Springs	26	74
Barkly	54	46
Katherine	44	56
Top End	30	70
NT-wide	39	61

Length of ownership and management

There was considerable variation between regions regarding the length of time properties had been under current ownership/management. Alice Springs properties had significantly longer time under current ownership and management than those in the other regions, with an average of 26 and 18 years respectively, reflecting successive generations of the same family owning the same property. The next longest tenure was 15 years for current ownership in the Top End region. There has been significant turnover in ownership and managers in recent years in the Katherine region, with five years being the median under current management. This turnover could reflect the number of owners in the region taking the opportunity to realise a capital gain as land values increased rapidly in the period between 2003 and 2009.



	Alice Springs	Barkly	Katherine	Top End	NT Total
Ownership	26	6	8	15	12
Management	18	9	5	6	6

Figure 4. Median years with current owners and managers on properties

Staff

The average number of staff employed by an NT pastoral operation is nine. Table 11 shows the Katherine region had the lowest percentage of properties employing contractors and the highest percentage employing seasonal station hands. The Barkly region employed the most staff overall (Figure 5) and had the highest employment rate of backpackers. The Barkly and Alice Springs regions were more likely to employ permanent staff as opposed to seasonal staff. Appendix 1 shows the average number of staff employed according to the number of head of cattle per property. While there appears to be some labour efficiency in terms of seasonal staff when cattle numbers increase, there is a marked increase in requirement for permanent staff once cattle numbers are more than 20 000.

Table 11. Percentage of properties employing different types of staff according to region

Staff type	Alice Springs	Barkly	Katherine	Top End	NT-wide
Permanent staff	97	92	86	80	88
Seasonal contractors	48	54	19	40	33
Seasonal station hands	34	31	62	45	50
Seasonal backpackers	17	31	5	25	14
Permanent staff only	24	23	16	15	18

A total of 566 permanent and 585 seasonal staff were employed by the 127 surveyed properties in 2010, suggesting that approximately 1718 staff were employed in the NT pastoral industry (based on having surveyed 67% of cattle).

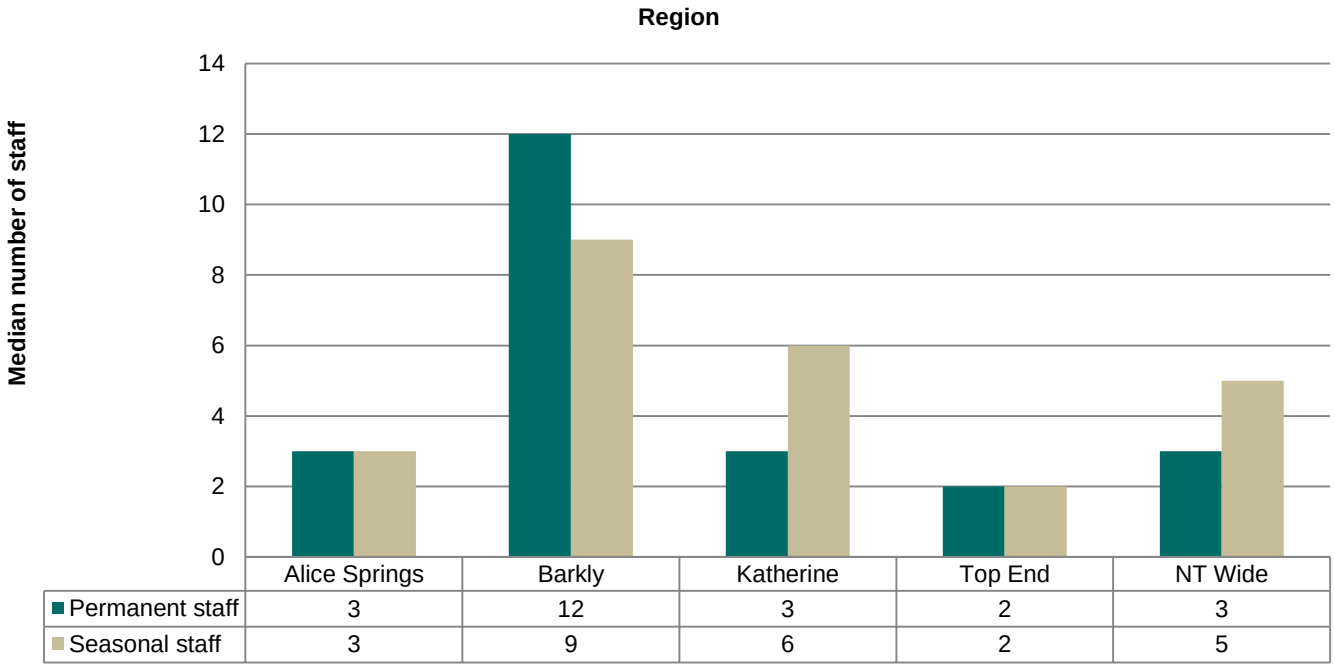


Figure 5. Median number of permanent and seasonal staff per property for properties that employ staff

Number of cattle

The most common herd size was between 2000 and 5000 head in all regions except the Barkly where more than 20 000 head was the most common herd size (Figure 6). Twenty two per cent of Katherine properties had between 10 000 to 20 000 head.

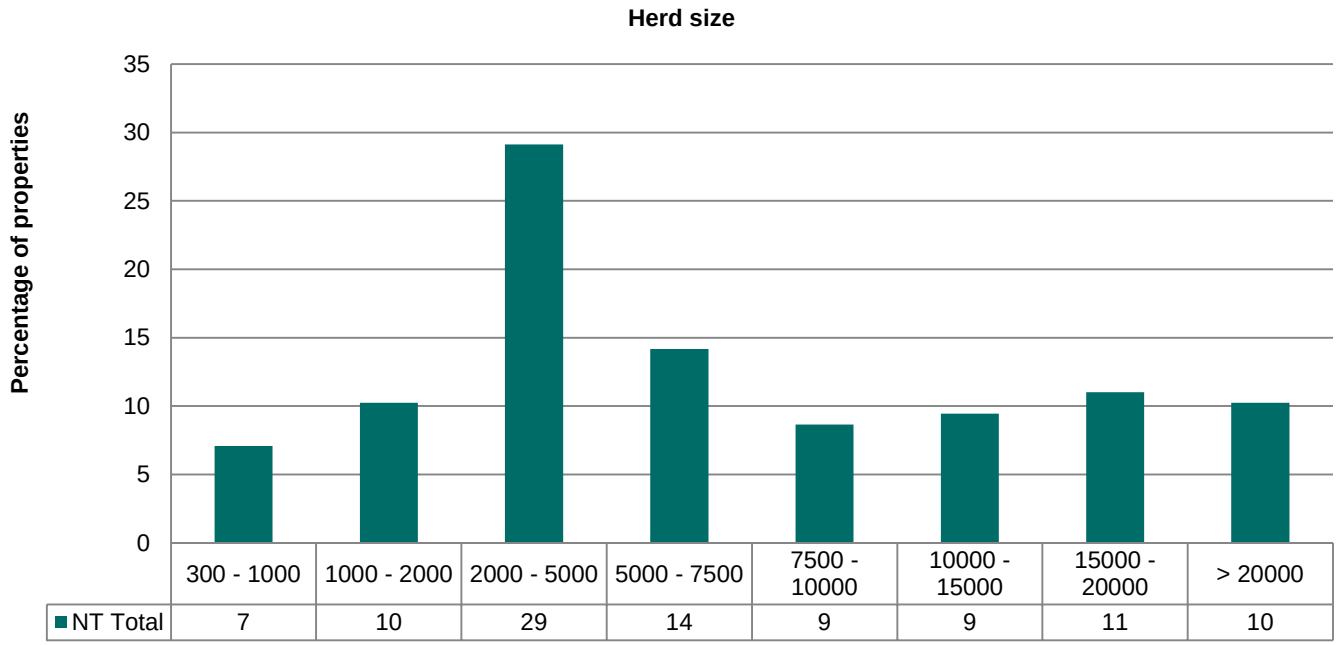


Figure 6. Size of herds managed by NT producers

Table 12 shows the average herd size in the NT in 2010 was 11 029 head, with a large variation between the regions due to the scale of the enterprises.

Table 12. Average number of cattle on properties by region

Region	Average number of cattle
Alice Springs	5856
Barkly	36 245
Katherine	10 730
Top End	3600
NT-wide	11 029

Producers were asked if their cattle numbers had changed since 2004. The responses are summarised in Table 13. A number of producers did not answer this question, which could have meant that they did not know due to changes in ownership or a lack of accurate records, or in some instances, there may have been no change. Overall, 38% of properties reported an increase in numbers and 7% reported a decrease.

Table 13. Percentage of properties that reported a change in cattle numbers since 2004

Region	Decrease	Increase	No change	No response
Alice Springs	10	32	19	39
Barkly	8	38	8	46
Katherine	8	38	41	13
Top End	5	40	30	25
NT-wide	7	38	31	24

Producers were asked by how much their stock numbers had changed since 2004. These were converted into AEs and the percentage change in AEs was calculated since 2004. Table 14 shows the magnitude of change in AEs across the regions.

Table 14. Estimates of average change in AEs since 2004

Region	% change in AE
Alice Springs	+13
Barkly	+12
Katherine	+10
Top End	+ 4
NT-wide	+10

All regions experienced an overall increase in numbers and had predicted increases in the 2004 survey due to planned development of infrastructure and improved pasture development (particularly in the Top End). The increase in Alice Springs is more likely due to the increase in herd numbers because of the run of good seasons.

Turn-off and markets

Main types of cattle enterprises

The majority of producers in the NT identified themselves as primarily cattle producers, with 30% of Top End producers identifying as both cattle and buffalo producers. Producers were asked to describe their main enterprise and the percentage of cattle under each enterprise type is shown in Table 15.

Table 15. Percentage of cattle according to main enterprise type in the regions of the NT

Region	Agistment	Breed and sell mainly live export feeder cattle	Breed and sell mainly slaughter cattle	Breed and sell or transfer cattle for growing out elsewhere in Australia	Growing/ finishing of transferred/ purchased cattle
Alice Springs	1	4	23	62	10
Barkly	0	23	0	68	9
Katherine	1	58	0	32	3
Top End	12	74	0	0	15
NT-wide	2	39	3	47	8

A small number of producers nominated other cattle enterprises on their properties. These included one Barkly producer selling through Queensland sale yards. Four Barkly producers and nine Katherine region producers indicated that they also bred and sold stud cattle in addition to their commercial enterprises.

Producers who were growing or finishing cattle that had been purchased or transferred were asked to indicate their throughput for the 12 months ending on 31/12/2010. Table 16 shows the number of head grown out per business and the percentage of properties which were involved in finishing or growing cattle in 2010. Growing and finishing cattle was an important strategy for Top End producers. A significant number of Barkly producers also indicated that they undertook growing and finishing cattle, mostly through purchasing weaners from other Barkly stations.

Table 16. Average throughput in head and percentage of properties involved in growing/finishing

Region	Throughput 2010	Properties (%)
Alice Springs	2631	39
Barkly	16 011	46
Katherine	4299	11
Top End	2602	55
NT-wide	5176	28

Seventeen per cent of NT producers indicated they had agistment cattle on their properties in 2010.

Table 17 shows the number of producers who had agistment cattle during this period, most significantly in the Top End region. It also provides the average number of AEs agisted in each region. The number of agisted cattle was converted to AEs, since some properties agisted steers and growing cattle, while others agisted breeders.

Table 17. Average AEs agisted and the number of properties involved

Region	AE agisted in 2010	Properties
Alice Springs	1680	4
Barkly	78	1
Katherine	1398	8
Top End	3368	8
NT-wide	2139	21

Markets

Due to the importance of Indonesia as a live export destination, the strict enforcement of the 350-kg weight limit for export cattle destined for Indonesia had significant ramifications for turn-off strategies for producers supplying this market. Table 18 shows that 45% of NT cattle were potentially affected, with the Katherine and Top End regions being most affected. Flow-on effects included increasing the numbers of cattle destined for other markets interstate.

Table 18. Percentage of cattle turned-off directly to various markets in 2010

Region	Live export	Feedlots	Saleyards	Abattoirs	Restockers	Other markets	Back-grounders	EU
Alice Springs	8	35	3	38	8	1	3	4
Barkly	39	0	3	12	1	0	45	0
Katherine	55	2	1	10	3	4	25	0
Top End	87	0	0	1	10	2	0	0
NT-wide	45	5	2	13	3	2	29	0

The figure of 55% of the Katherine region's turn-off to live export refers only to cattle sent directly to live export. Some of the young growing livestock turned-off to backgrounders were also destined for the live export market. So the true live export figure for the Katherine region was 80% and for the NT it was 57%.

Four per cent of cattle from the Alice Springs region were supplied to the European Union. 'Other' markets included stud bulls to NT producers and commercial breeder sales. One Top End producer had a buffalo hunting enterprise as a sideline providing trophy bulls to sporting shooters.

Table 19 shows the destinations of NT cattle, mainly to South-East Asia and Queensland. Taking into account that a large majority of cattle turned-off to the company supply chain in the Katherine region ultimately ended up in South-East Asia, it becomes apparent that 52% of cattle sold from the NT were turned-off to South-East Asia.

Table 19. Percentage of cattle turned-off from the regions of NT to different markets in 2010

Region	Northern Territory	Queensland	South Australia	South-East Asia	Middle East	Company supply chain	New South Wales	Victoria
Alice Springs	8	32	48	3	0	3	6	1
Barkly	1	34	2	38	0	24	0.3	1
Katherine	12	6	1	52	1	23	4	1
Top End	4	6	0	87	0	0	1	0.3
NT-wide	6	20	7	43	0.4	19	3	1

Anecdotally, numbers of cattle supplied to interstate destinations in 2010 would have been higher than in preceding years as a number of people indicated that they had changed their turn-off destination due to the enforcement of the 350-kg weight limit to Indonesia. Table 20 shows the other strategies employed by producers in the regions to deal with females that had gone over this weight limit.

Table 20. Percentage of producers employing various management strategies for heavy/cull cows after the import weight restrictions were enforced

Region	Held heavy cows over	Sold heavy cows to interstate saleyards	Sold heavy cows direct to slaughter	Sold cows to NT breeders
Alice Springs	3	3	3	0
Barkly	15	23	23	0
Katherine	25	6	41	5
Top End	60	10	20	0
NT-wide	24	8	27	2

Producers also nominated alternative marketing strategies for males as shown in Table 21. The most common strategy in the Katherine and Top End regions was to change the management of their steers to ensure they were sold before reaching 350 kg. This included various strategies, such as increased frequency of weighing and drafting into weight ranges, ceasing the use of supplements, HGPs and selling steers lighter before the end of the dry season.

Table 21. Percentage of producers employing various strategies for steers after the import weight restrictions were enforced

Region	Held heavy steers over	Sold heavy steers to interstate saleyards	Sold heavy steers direct to slaughter	Adjusted management of steers to ensure none went over 350 kg	Sold steers/ heifers lighter
Alice Springs	10	3	10	3	0
Barkly	23	23	15	23	0
Katherine	17	8	17	37	5
Top End	40	5	20	40	0
NT-wide	20	8	16	28	2

Other strategies mentioned specifically by Katherine region producers for both males and females included utilising agistment in areas with access to markets during the wet season (3% of producers), selling steers and heifers lighter (5% of producers) and selling cull bulls interstate (10% of producers).

An important strategy for Barkly producers was sending cattle to another company property, with 23% employing this practice. Two Katherine region producers and one Top End producer also transferred cattle to other properties in a company chain to mitigate the effects of the weight restrictions.

Overall, 20% of NT producers said they felt that the enforcement of weight restrictions did not require them to change any aspect of their production system. Alice Springs was least affected (68% not affected) while the Katherine and Top End regions were most affected, with only one producer in each region stating it had no effect on where they sent their cattle. It had a moderate effect in the Barkly region with 23% of producers saying it had no effect on their turn-off strategies.

Turn-off

Major months for cattle turn-off in the NT were May, June and September. Table 22 shows the breakdown by month of the percentage of cattle turned-off across each region and NT-wide. The majority of Barkly and Katherine region producers were limited to dry season turn-off due to the inability to truck cattle out during the wet. Alice Springs region producers tended to turn-off cattle a few months earlier than Barkly and Katherine producers, presumably due to better access, but still avoiding the hottest period of the year. The Top End had an extended turn-off period that capitalised on wet season access.

Table 22. Percentage of cattle turned-off by month in 2010 from the regions of NT

Region	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Alice Springs	0	1	12	12	16	15	21	4	8	8	2	0
Barkly	1	0	2	7	26	18	9	13	17	7	1	1
Katherine	0	1	3	7	21	21	13	9	13	10	3	0
Top End	13	15	12	8	12	6	1	2	0	11	10	10
NT-wide	1	1	4	7	22	18	12	10	14	8	2	1

Table 23 shows that the highest percentage of stock class turned-off in the NT was feeder steers to live export. The next most significant was feeder steers to Queensland and then heifers to live export. There were marked differences in market turn-off destinations between regions, with Alice Springs having very few live export feeder

steers but one quarter of total turn-off was feeder steers destined for other NT properties, and 22% of total turn-off was slaughter steers to domestic markets. The Katherine and Top End regions turn-off was dominated by feeder steers to live export, and the most significant turn-off class from the Barkly region properties was feeder steers to Queensland.

Table 23. Percentage of turn-off by stock class according to region

Stock Class	Alice Springs	Barkly	Katherine	Top End	NT-wide
Between property transfer	0	0	18	0	9
Bulls live export	0	0	0	0	0
Bulls NT	0	0	0	0	0
Bulls slaughter	2	1	1	1	1
Cow and calf	0	0	1	0	0
Cows interstate	8	4	8	1	6
Cows live export	0	0	2	2	1
Cows NT	0	0	3	3	2
Cows slaughter	10	10	3	0	6
Feeder steers live export	5	18	31	45	26
Feeder steers NT	24	0	6	10	5
Feeder steers QLD	7	38	3	0	16
Heifers live export	0	13	13	35	14
Heifers NT	0	0	2	1	1
Heifers slaughter	3	3	1	0	2
Mickeys live export	0	0	0	1	0
Mickeys NT	1	0	0	0	0
Mickeys slaughter	0	0	0	0	0
Other	19	10	4	0	7
Slaughter steers	22	0	0	0	2
Slaughter steers live export	0	2	1	0	1

Cattle management

Breed of cattle

The most common breed of cattle in the NT was Brahman, which represented 48% of all cattle (Table 24). Composites, crossbreds, Charbrays, Droughtmasters and Santa Gertrudis made up 47% of NT cattle, most of which had significant tropically adapted content. Only about 5% of cattle were described as purebred temperate breeds, such as Angus, Hereford or Shorthorn. Most of these were located in the Alice Springs region.

Table 24. Percentage of cattle within each breed according to region

Breed	Alice Springs	Barkly	Katherine	Top End	NT-wide
Angus	3	0	0	0	0
Brahman	2	21	78	83	48
Charbray	0	5	5	1	4
Composite	1	37	3	2	15
Crossbred	34	29	10	8	20
Droughtmaster	16	0	2	0	3
Hereford	17	1	0	1	3
Other	1	0	1	2	1
Santa	18	6	0	0	5
Shorthorn	8	0	0	4	1

Breeding aims

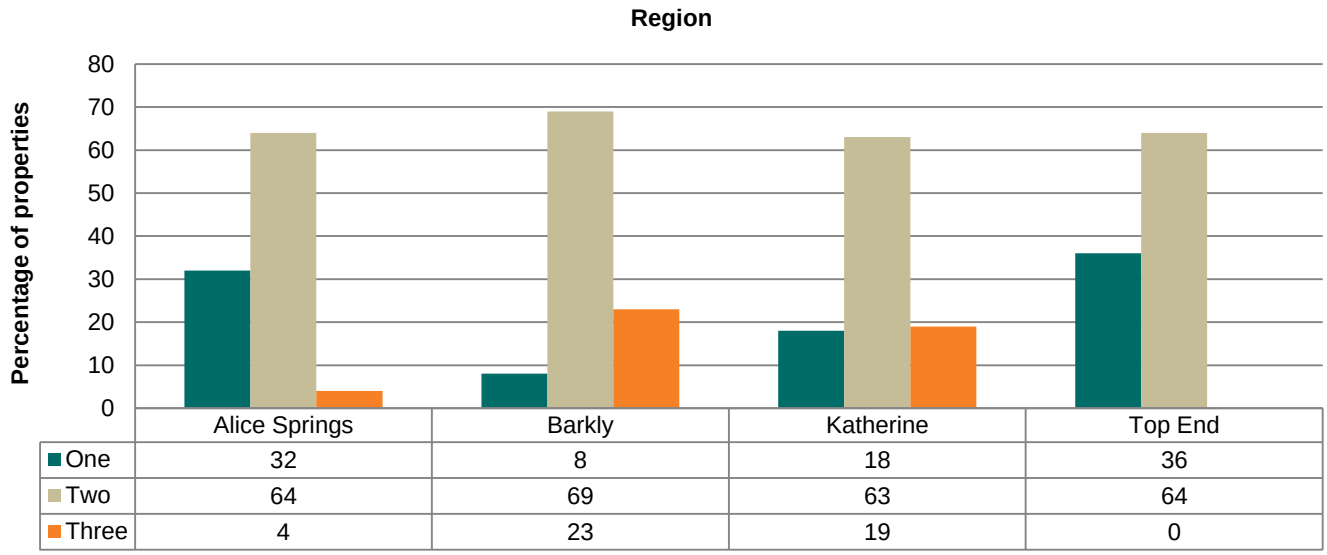
The most common breeding aim of NT producers was to select traits within a breed to improve performance (Table 25). Thirty eight per cent of producers mentioned cross breeding as their main aim, broken down to 23% aiming to improve herd performance and 15% to improve market suitability. The Barkly and Top End regions named crossbreeding for improved herd performance as their main aim.

Table 25. Main breeding aims of NT producers

Breeding aim	Producers (%)
Select traits within breeds	35
Crossbreed for improved herd performance	23
Crossbreed to suit market	15
Upgrade to Brahman	10
Concentrate on other areas of management, not genetics	9
Other	4
Develop a composite breed	4
Upgrade to another tropical breed	2

Mustering practices

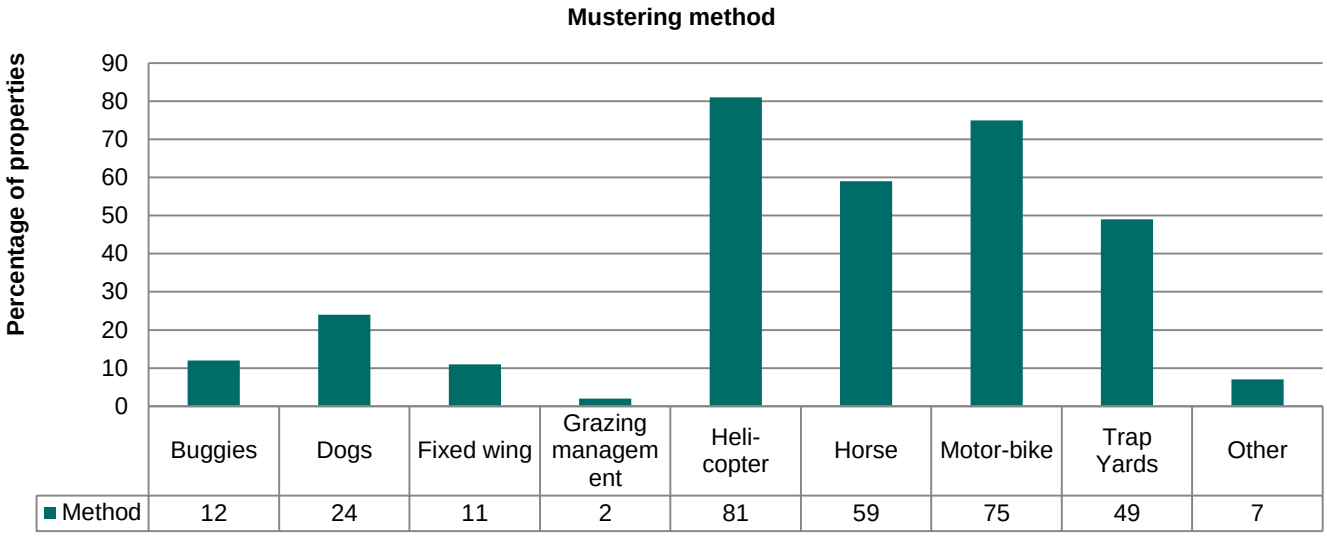
Two mustering rounds was the most common strategy (64% of NT producers) (Figure 7). Thirty two per cent of Alice Springs producers and 36% of Top End producers conducted only one round. Barkly and Katherine producers were most likely to conduct a third round, at 23% and 19%, respectively.



	Alice Springs	Barkly	Katherine	Top End
One	32	8	18	36
Two	64	69	63	64
Three	4	23	19	0

Figure 7. Percentage of properties conducting 1, 2 or 3 rounds of mustering

Figure 8 shows that helicopters were commonly used for mustering on NT properties, followed by motorbikes and horses. Motorbikes were most commonly mentioned in the Top End and Barkly regions. Trap yards were far more common in the Alice Springs region, which was also characterised by the lowest use of horses. 'Other' mustering methods mentioned included quad bikes, gyrocopters and vehicles.



	Buggies	Dogs	Fixed wing	Grazing management	Heli-copter	Horse	Motor-bike	Trap Yards	Other
Method	12	24	11	2	81	59	75	49	7

Figure 8. Percentage of properties using different mustering methods

Survey participants were asked to estimate their mustering costs per head, taking into account labour and associated machinery costs. In 2010, the average mustering cost for an NT producer was $14.87/head. There was a high variation according to region (Table 26) and ownership structure (Table 27).

Table 26. Average mustering costs per head

Region	Cost/head ($)
Alice Springs	12.29
Barkly	17.10
Katherine	13.32
Top End	11.55
NT-wide	14.87

Owner-managers had the lowest mustering cost of $10.99/head. Company-owned properties and agistees had the highest mustering costs, spending $17.02/head and $31.85/head, respectively. The agistee figure would most likely be higher due to having fewer cattle on average and also to a lower sample size. The Top End region had the lowest figure, most likely due to a high proportion of owner-managers and smaller paddock size. The Alice Springs region also had a low figure due to the influence of owner-managers on properties and the ability of most properties to muster via trapping on waters.

Table 27. Average mustering costs per head according to ownership type

Ownership type	Cost/head ($)
Company-manager	17.02
Indigenous owned land	16.23
Other	12.36
Owner-manager	10.99
Private-agistee	31.85
Private-lessee	14.79
Private owned-manager	12.14

Bulls

The average bull percentage used in the NT was 3.6%. The regional variations were Alice Springs 3.9%, Barkly 3.2%, Katherine 4% and the Top End 3.2%.

Table 28 shows that producers most commonly sourced bulls from Queensland stud breeders (56%), representing 39% of the bulls purchased in the NT. Another 26% of bulls were home-bred by 36% of properties. Twenty six per cent of producers said they sourced bulls from NT bull producers; however, this only represented 7% of total bulls purchased. Sixteen per cent of properties bought 10% of bulls from non-stud breeders (commercial breeders).

Estimates of feral bulls as a proportion of total bull numbers ranged between 5.5% and 6.8% in the Katherine, Alice Springs and Top End regions. The Barkly region had the lowest at 0.5%. Sixty properties responded to this question, half of which were from the Katherine region, indicating this region probably experienced the highest prevalence of feral bulls.

Table 28. Percentage of properties buying bulls from different sources and percentage of bulls from each source

Source	Properties	Bulls
Queensland	56	39
Breed own	36	26
Within company	9	14
Commercial breeders	16	10
Northern Territory	26	7
South Australia	9	3
New South Wales	3	1
Western Australia	1	0
Victoria	0	0

Table 29 shows that 56% of NT producers rated temperament as the most important selection criterion when selecting bulls; structure/conformation were mentioned as most important by 37% of producers.

Table 29. Percentage of producers rating importance of traits in bull selection

Trait	Most	2nd	3rd	4th
Temperament	56	24	12	2
Structure/conformation	37	42	8	3
Polled	9	10	25	11
EBVs	10	5	12	11
Fertility	8	3	5	1

Note: Categories do not add up to 100% as some producers rated several traits as equally important.

Thirty eight per cent of producers indicated they used EBVs as a tool for assessing potential bull purchases, representing 29% of NT bulls purchased. The Barkly region had the highest proportion of bulls purchased using EBV information (Table 30).

Table 30. Percentage of properties and bulls purchased using EBVs according to region

Region	Properties	Bulls
Alice Springs	56	37
Barkly	69	53
Katherine	22	17
Top End	44	36
NT-wide	38	29

Table 31 shows that 71% of NT producers using EBVs considered fertility traits to be their highest priority, followed by growth rate.

Table 31. Most important breeding traits among EBV users (percentage of properties)

Trait	1st priority	2nd priority
Fertility	71	12
Growth rate	24	38
Birth weight	5	14
Carcase traits	7	10

Six per cent of producers said they used the Jap Ox selection index to select bulls and 9% said they used the Northern Live Export selection index with highest numbers using the export index from the regions more focused on live export production (Table 32).

Table 32. Percentage of properties using selection indexes

Region	Jap Ox	Northern Live Export
Alice Springs	13	3
Barkly	23	8
Katherine	2	8
Top End	0	20
NT-wide	6	9

Table 33 shows that 20% of NT bulls underwent a BBSE and 43% were semen-tested. Of those who conducted bull testing, predominantly did so prior to purchase and about half as many did so every two to three years during the bulls' working lives.

Full BBSEs were much more likely to be conducted in the Barkly or Alice Springs regions, whereas in the Top End and Katherine regions producers were more likely to conduct semen testing only as it was less likely that their bull suppliers conducted BBSE prior to sale.

Table 33. Percentage of properties testing bulls and percentage of bulls tested according to region

Region	BBSE		Semen test	
	Properties	Bulls	Properties	Bulls
Alice Springs	27	26	33	41
Barkly	54	54	31	22
Katherine	13	7	51	50
Top End	13	13	53	53
NT-wide	20	27	43	37

Breeder management

Weaning percentage

Producers were asked to estimate their three-yearly average weaning percentage to provide an idea of the reproductive rates across the regions. These are self-reported figures and are somewhat confounded as there is no standardised method for calculation. That said, these estimates provide an indication of the variation between regions. Table 34 shows that the average reported weaning percentage in mature breeders in the NT was 67%.

Table 34. Average weaning percentages according to region

Region	First joined	Second joined	Mature breeder
Alice Springs	72	67	75
Barkly	75	65	72
Katherine	78	46	61
Top End	74	40	61
NT-wide	75	51	67

Calf loss

Of the 127 producers surveyed, only 39 provided estimates of calf loss. As this is an area that is difficult to quantify, an attempt was made to gauge the confidence producers had in their estimates. Of those who answered, 34% were not at all confident, 55% were moderately confident and 10% were very confident. The average calf loss reported in mature breeders was 12% for the whole NT. There was quite a range between regions, from an average estimated loss of 3% in the Top End to 4% in Alice Springs, 11% in Katherine and 14% in the Barkly.

Cull cattle

The average percentage of breeders culled annually in the NT was 12% (Table 35). The Katherine region had the lowest percentage suggesting more properties may have been in a herd build-up phase. Figure 9 shows the percentage of producers that used various criteria for culling breeders, with pregnancy diagnosis and age being the most common.

Table 35. Average percentage of breeders culled annually

Region	%
Alice Springs	12
Barkly	15
Katherine	9
Top End	12
NT-wide	12

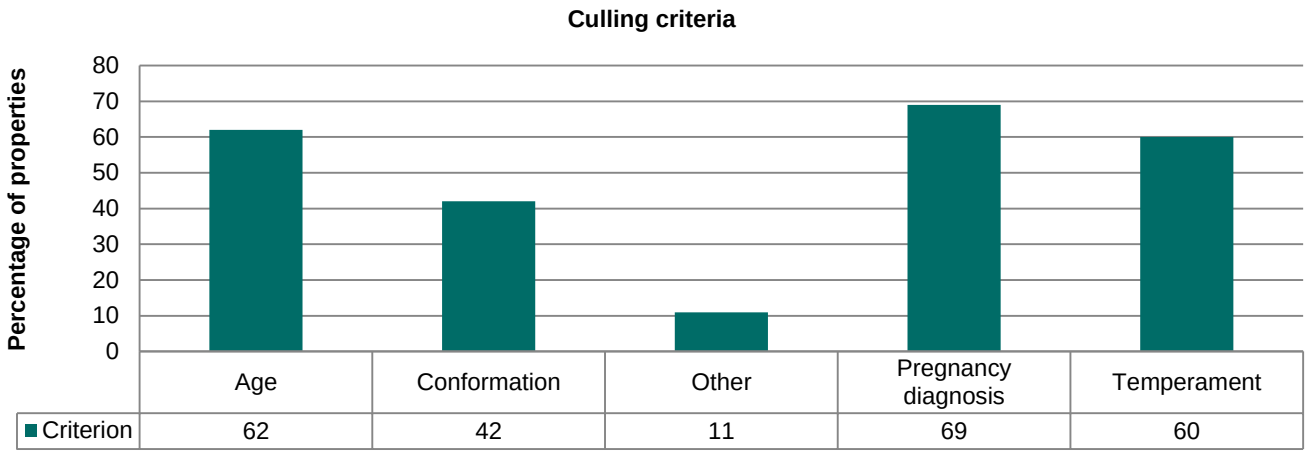


Figure 9. Criteria for culling breeders

Company properties were more likely to cull based on pregnancy diagnosis and age compared with other ownership types. The average culling age was 10 years and there was no real difference between the regions except for the Top End, which on average, culled a year later at 11 years.

On average, 17% of NT cull cows and 21% of cull heifers were spayed prior to sale (Table 36). There were marked contrasts between the regions, mostly reflecting their target markets. Alice Springs producers were more likely to send culled breeders to abattoirs where a pregnancy tested 'empty' status is not a requirement. Dropped ovary was the most common method of spaying.

Table 36. Percentage of properties spaying cattle and percentage of culled females spayed

Region	Breeders		Heifers	
	Properties	Cattle	Properties	Cattle
Alice Springs	10	1	10	4
Barkly	15	2	8	10
Katherine	42	38	37	40
Top End	21	7	0	0
NT-wide	28	17	22	21

Segregation

Segregation of breeders allows producers to target management for a specific purpose. Age was the most important criterion for segregation according to producers (Figure 10), but when taking into account the size of herds under segregation strategies, pregnancy status was the most significant criterion, with companies more likely to segregate breeders based on pregnancy diagnosis. While only 27% of properties segregated breeders into calving windows, these properties represented 46% of cattle in the survey.

Privately-owned properties were more likely to segregate based on age. 'Other' reasons for segregating breeders included breed, lactation status and females to be culled.

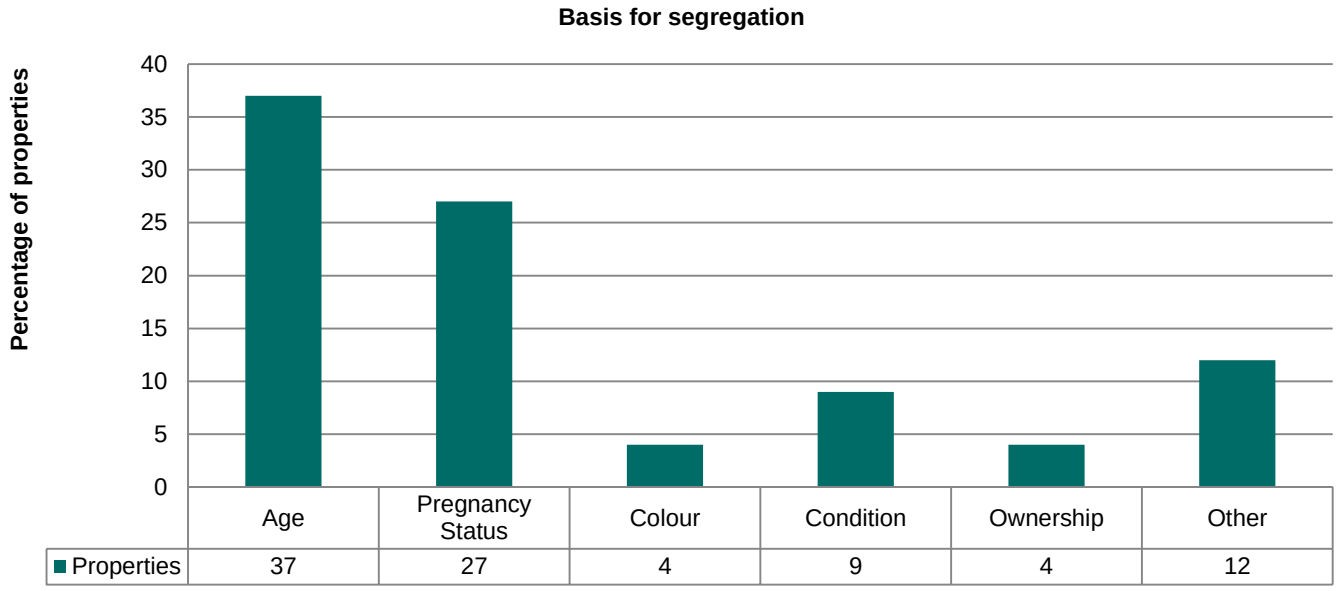


Figure 10. Percentage of properties that segregated breeders for different reasons

Pregnancy testing

Seventy per cent of NT producers pregnancy-tested cows. Producers in the Alice Springs region were least likely to pregnancy-test (39% of producers). Barkly (85%) and Katherine (84%) producers were most likely to pregnancy-test; 80% of Top End producers pregnancy-tested at least one class of stock. Top End and Katherine region producers were more likely to pregnancy-test their animals themselves.

Dry cows were most commonly pregnancy-tested (33% of producers) and 20% of producers pregnancy-tested all cows (Figure 11). Producers in the Barkly (54%) and Top End (44%) were most likely to pregnancy-test all cows. Companies were also most likely to pregnancy-test all cows and to employ a vet to do the test.

Privately-owned properties generally only pregnancy-tested dry and sale/cull stock.

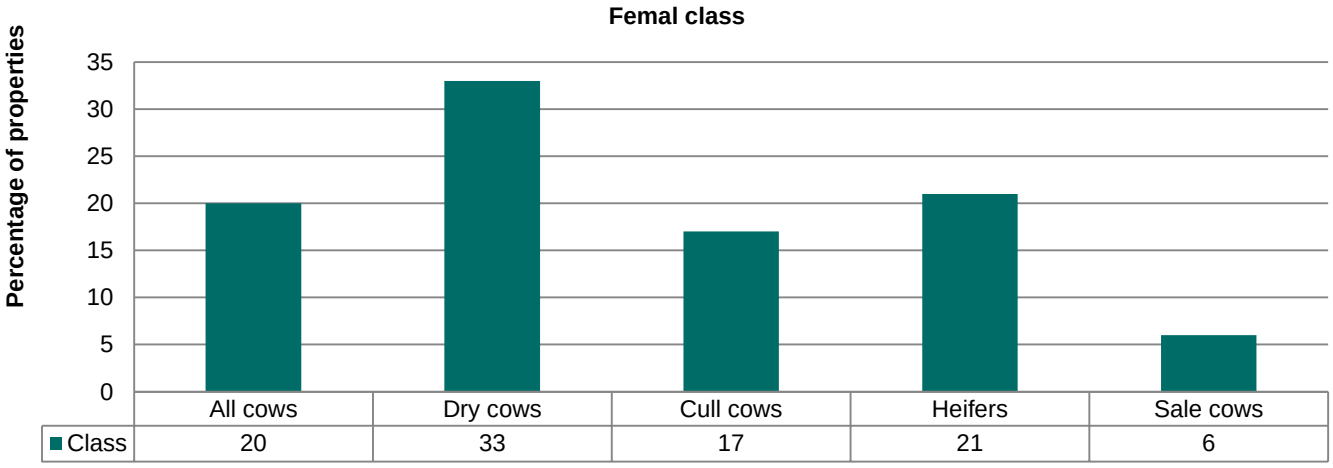


Figure 11. Percentage of properties pregnancy-testing different classes of female stock

Herd performance recording

Fifty per cent of NT producers individually identified stock with tags in order to carry out some form of performance recording, covering 38% of the NT cattle herd (Figure 12). Top End producers were the most likely to individually identify stock, with 64% of the cattle being tagged.

The most common form of individually identifying stock was through a combination of management tags and electronic identification tags.

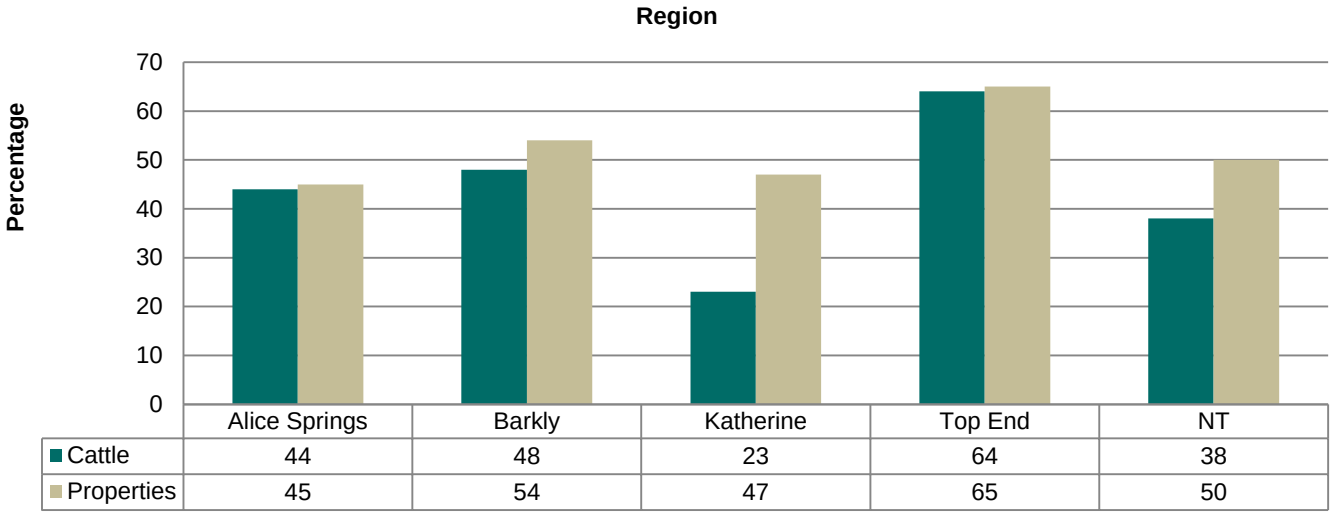


Figure 12. Percentage of properties individually identifying stock and percentage of stock tagged for performance recording purposes

Table 37 shows that 11% of NT producers were not individually identifying animals although they had planned to do so, while 37% were not and had no plans to do so. The Top End region had the highest frequency of herd recording and also the lowest rate of planned increase.

Table 37. Percentage of properties at various stages of herd performance recording

Region	None currently, but plan to	None currently, none planned	Currently recording, plan to do more	Currently recording, no more planned
Alice Springs	6	42	19	32
Barkly	23	23	23	31
Katherine	11	41	10	38
Top End	10	25	10	55
NT-wide	11	37	13	39

Heifers were the most commonly recorded stock class which is a logical starting point for producers beginning to record their herds (Figure 13).

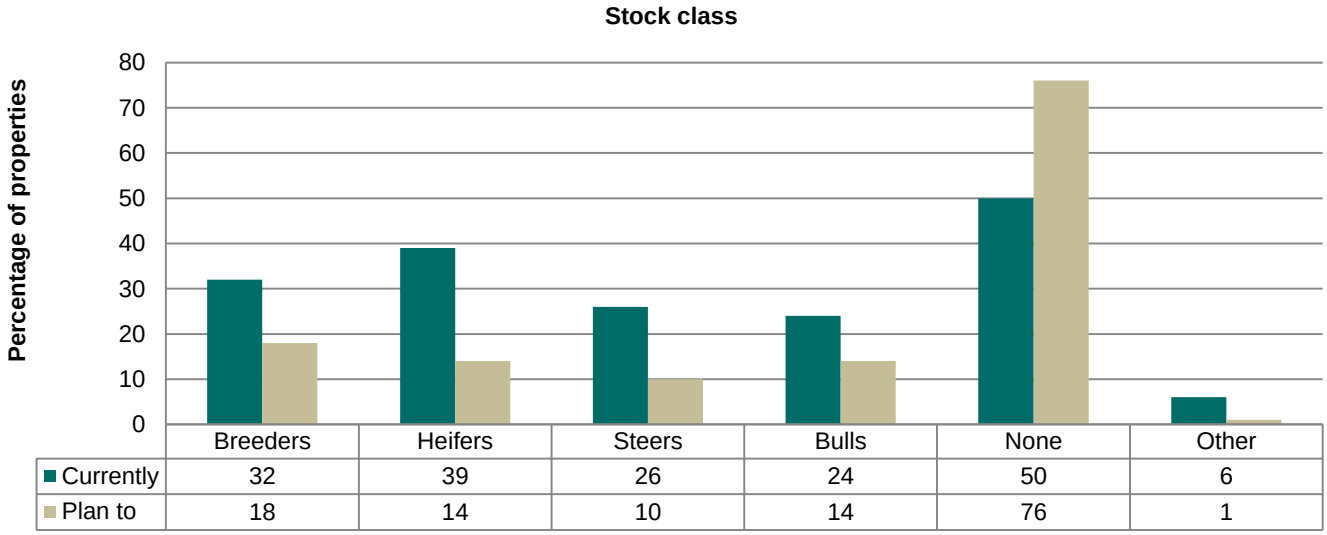


Figure 13. Percentage of properties currently and planning to individually identify various classes of stock for performance recording purposes

Table 38 shows that of the producers who were recording, 39% recorded age and 31% recorded pregnancy status. Other recorded traits included parentage, colour, horn status, health treatments, gender, date of birth and origin.

Table 38. Percentage of properties recording various traits

Trait	%
Age	39
Pregnancy status	31
Weight	28
Lactation status	25
Body condition score	15
Other	13
Frame score	5

Artificial insemination or embryo transfer

Four properties in the NT indicated that they used artificial insemination (AI), three in the Katherine region and one on the Barkly. The Barkly property used AI in their commercial herd while the Katherine properties used AI in their stud herds.

One Katherine property had utilised embryo transfer technology in their stud in the past.

Continuous or controlled mating

A continuous mating system where bulls stay with the cows year round was the most common in the NT. Eighteen per cent of NT producers stated they attempted to control mate their mature breeders, with Top End producers having the highest proportion of mature breeders under a controlled mating system (20%). Thirty two per cent of maiden heifers in the NT were control mated, and 12% of first-calf heifers. Katherine had the highest proportion of maiden (45%) and first-calf heifers (18%) under controlled mating (Table 39).

Producers stated the major reason they did not control mate was because they could not control bulls (58%). In control-mated herds, the joining period was most commonly December/January to March/June (with May being the most common month for removing bulls). Producers generally aimed to segregate the bulls from the heifers a month or two earlier, presumably to reduce the incidence of out-of-season calving and to ensure heifers had the best chance to reconceive.

Table 39. Percentage of properties control mating and percentage of females under control mating

Region	Maiden heifers		First calf heifers		Mature breeders	
	Properties	Cattle	Properties	Cattle	Properties	Cattle
Alice Springs	7	4	3	2	3	2
Barkly	23	26	15	8	15	8
Katherine	41	45	24	18	21	12
Top End	50	28	40	15	36	20
NT Wide	31	32	19	12	18	9

Mortality rates in breeders

Since mortality rates are very difficult to measure in extensive northern herds, the reported figures must be viewed as estimates only. The average mature breeder mortality rate reported by NT producers was 3.9%. Wide variation existed between the regions, with Barkly producers reporting an average of 3% and Alice Springs producers reporting 8.5% (Table 40).

Table 40. Average mortality rates in mature breeders

Region	Number of responses	Average mortality %
Alice Springs	11	8.5
Barkly	9	3.0
Katherine	43	4.2
Top End	8	4.2
NT-wide	71	3.9

Heifer management

On average, 59% of heifers were kept as replacement breeders in the NT in 2009 and 2010. Table 41 shows that there was a wide variation between regions in this figure. The higher Alice Springs estimate was likely affected by the higher mortality rate reported previously.

Reflecting an earlier stage of herd build-up, Indigenous-owned land, agistees and lessees tended to keep more replacement heifers compared with other ownership types.

Table 41. Percentage of heifers kept as replacements averaged over 2009 and 2010

Region	Heifers kept (%)
Alice Springs	79
Barkly	55
Katherine	58
Top End	51
NT-wide	59

Figure 14 shows the time at which NT producers decided which heifers to retain in the herd as replacement breeders. Fifty four per cent of producers made this decision prior to joining. The next most common time was at weaning (33%).

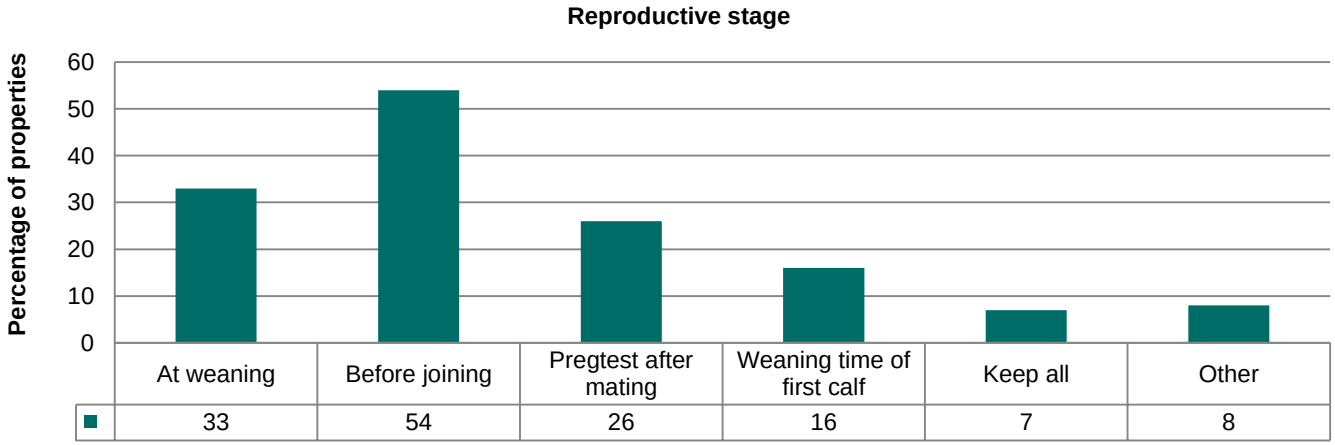


Figure 14. Timing of decisions to keep replacement heifers

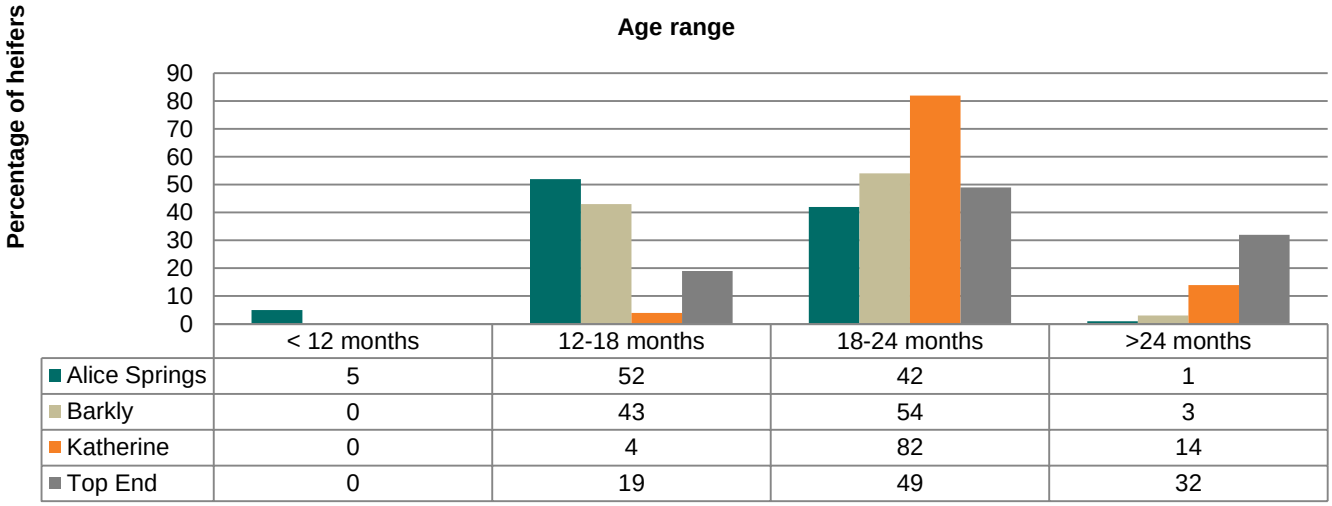
To understand how producers made decisions on the females they retained in their herds, they were asked to rate a number of selection criteria in terms of their importance when selecting heifers. A score of one represented not at all important and five represented extremely important. Table 42 shows the average rating of each and puts temperament and conformation of equal importance in selection decisions. Colour was perceived to be the least important.

There were slight differences between regions. In the Barkly region, weight and temperament were the most important. In the Katherine region, type was regarded as equally important as conformation and temperament, and in the Top End, the weight of the heifers was regarded as the most important criterion.

Table 42. Average rating of importance of criteria for heifer selection

Selection criteria	Rating (1-5)
Temperament	4.2
Conformation	4.2
Type	4.0
Weight	3.8
Fertility	3.5
Polled	2.7
Colour	2.5

Sixty five per cent of NT heifers were mated between the ages of 18 and 24 months. The next most common age bracket was 12 to 18 months (25% of heifers). Figure 15 shows the 12 to 18 month mating age was more commonly mentioned in the Alice Springs and Barkly regions. Katherine and Top End producers predominantly mated heifers in the 18 to 24 month age range.



	< 12 months	12-18 months	18-24 months	>24 months
Alice Springs	5	52	42	1
Barkly	0	43	54	3
Katherine	0	4	82	14
Top End	0	19	49	32

Figure 15. Percentage of heifers mated at different ages according to region

In addition to age, weight played an important role in decisions about when to mate heifers. Sixty seven per cent of NT heifers were in the 250-300 kg weight range when they were first joined (Table 43). There was a wider range in heifer joining weights in the Alice Springs region, with a higher percentage of heifers joined at less than 200 kg and at greater than 300 kg compared with other regions.

Table 43. Percentage of heifers joined at different weight ranges in the NT

Weight range	%
< 200 kg	2
200-250 kg	9
250-300 kg	67
>300 kg	21

Thirty five per cent of producers weighed some heifers prior to joining. Heifers were most commonly weighed prior to joining and at weaning. Far fewer producers in the Alice Springs region weighed heifers compared with other regions.

Segregating heifers from breeders allows targeted management strategies to be undertaken more easily, such as early weaning, supplementary feeding and joining with young bulls. Figure 16 shows that most of the heifers in the Barkly and Katherine regions were segregated from the breeding herd, with Top End and Alice Springs producers less likely to segregate. The most common reasons provided for not segregating were 'not enough paddocks' (43% of properties) and 'don't believe it is worth it' (33% of properties).

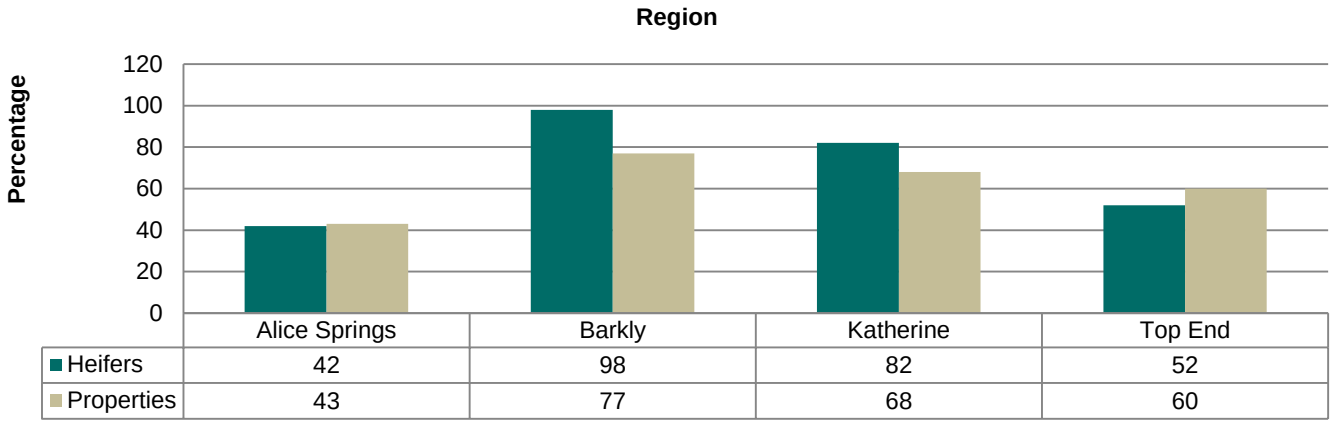


Figure 16. Percentage of heifers segregated from breeders and percentage of properties segregating

Table 44 shows the age at which heifers were no longer kept segregated from the main breeding herd. The most common times to put heifers into the main breeding herd was after weaning their first calf (31%) and at the start of their second joining (28%).

Table 44. Percentage of heifers segregated until various reproductive ages in the NT

Age	%
Until start of first joining	9
Pregnancy test after first joining	1
Until start of second joining	28
After weaning of first calf	31
Until weaning 2nd calf	4
For life	11
Other	7

In the NT as a whole, heifers were largely mated to bulls less than three years old (86%); however, in the Top End only 30% of heifers were mated to young bulls.

Producers were asked, 'What was the most important factor to determine when calves were weaned from heifers?' Sixty five per cent of producers thought condition of heifers was the most important, followed by pasture condition (36%).

Management of young stock

Weaning

The average weaning weight in the NT was 187 kg at first round and 160 kg at second round (Table 45). This varied according to region due to differences in inherent productivity of the land and the differences between cattle breeds, with European/British type cattle and crossbreeds tending to produce heavier weaners and the lower rainfall areas tending to produce better live-weight gains.

The choice of minimum weaning weight is an important management tool for NT producers as time of weaning has a significant effect on cow body condition. The minimum average weaning weight in the NT was 124 kg in first round and 112 kg at second round because maintaining cow body condition becomes more critical towards the end of the dry season.

Not all producers in the Alice Springs and the Top End regions weaned. Twenty four per cent of NT producers weaned according to age, 13% weaned at a set weight, while 71% stated they adjusted their weaning weight each year according to seasonal conditions.

Table 45. Average minimum weaning weight and average weaning weight for first and second round musters

Region	Av. minimum weight (kg)		Av. weaning weight (kg)	
	First Round	Second Round	First Round	Second Round
Alice Springs	151	153	197	203
Barkly	116	113	201	175
Katherine	129	103	174	140
Top End	107	97	164	126
NT-wide	124	112	187	160

NT producers educated their weaners using a variety of methods. Table 46 shows that NT weaners were most commonly worked through yards (88%), fed in yards (85%) and tailed out (82%).

Table 46. Percentage of weaners receiving different education strategies during weaning

Weaning education	%
Loaded on/off truck	62
Moved to another paddock/bore	54
Feeding in yards	85
Tailed out	82
Worked through yards	88
Moved to another property for weaning	10
Other	5

Since feeding weaners constitutes a significant cost, appropriate management of weaners through the period of feeding is critical to ensure efficient targeting of feed and prevent bullying of small weaners. Fifty eight per cent of producers segregated weaners based on weight, which represented 40% of weaners.

Producers were almost twice as likely to segregate weaners that weighed less than 100 kg and put them in a different management system than weaners in the 100 to 150 kg weight range.

Alice Springs region producers were least likely to segregate (7% of properties) and Barkly region producers most likely to segregate smaller weaners (62% of properties). Overall, 38% of properties segregated weaners, with larger producers more likely to segregate 100 to 150 kg weaners and smaller properties more likely to segregate weaners less than 100 kg. This may reflect the geographic spread and resultant nutritional differences between larger company-owned properties on prime country, versus smaller privately-owned properties on less productive country, or it may just reflect greater emphasis on individual weaners by smaller properties.

Table 47. Percentage of properties using different feeding strategies for various weaner weight classes

Feeding strategy	All	< 100 kg	100-150 kg
Short term feeding in yards with hay	82	5	1
Short term feeding in yards with concentrate	16	46	8
Put on spelled pasture	38	7	2
Other	3	5	1
None	3	0	0
Feed to target weight	4	46	8
Feed throughout dry season	31	20	3

NT producers most commonly fed all of their weaners hay (Table 48). Weaners less than 100 kg were more likely to be fed weaner pellets, cottonseed meal or copra meal.

Table 48. Percentage of properties feeding various feedstuffs to different weight classes of weaners

Feedstuff	All	< 100 kg	100-150 kg
Copra meal	7	7	3
Cottonseed meal	4	7	4
Grass hay (improved pasture)	30	2	1
Legume hay	16	3	2
Legume/grass hay mix	11	2	1
Native/rangeland hay	15	1	1
No response	3	0	0
None	1	0	0
Other	5	4	1
Dry season supplement	21	3	3
Weaner pellet	8	23	10

Year branding

Seventy five per cent of NT livestock were branded according to the calendar year, 21% were branded according to the financial year and 3% were not year branded.

Producers in the Katherine region often stated their year brand started with the second round, commencing in August and were more aligned with the financial year branding system.

Nutritional management

Supplement

Eighty per cent of NT properties had some form of supplementation program. Overall, in the Barkly, Katherine and Top End regions 62% of producers supplemented in the wet season and 80% supplemented through the dry. The Katherine region had the highest percentage of properties that supplemented (89%) as well as the most properties that supplemented in the dry season. The Top End region had the highest percentage of properties that supplemented in the wet season (74%) and all year (58%).

The pattern of feeding was quite different in the Alice Springs region where it was very dependent on seasonal conditions. Hence, they were not included in dry and wet season supplementation summaries. Thirty per cent of Alice Springs producers fed some stock for part of the year and another 26% fed a supplement all year. Across all regions, 35% of producers supplemented some stock all year.

Table 49 shows some of the broad supplementation strategies that NT producers used and looks at what percentage of producers were supplementing only at certain times of the year. While 80% of producers supplemented in the dry season, 20% actually only supplemented during the dry season. Also, 3% of producers only supplemented in the wet season, although 62% supplemented in the wet season. Twenty nine per cent of producers only a fed supplement all year round.

Table 49. Percentage of properties in the NT carrying out various broad supplementation strategies

Broad supplementation strategy	%
Dry season supplementation only	20
Wet season supplementation only	3
Year round supplementation only	29
Dry and wet season supplementation, but not all year	22
Supplementation all year for some stock and part of the year for other stock	6

Table 50 shows the percentage of cattle across the NT that were supplemented at different times of the year according to region. Seventeen per cent of NT cattle were supplemented all year. Including the livestock that were supplemented all year, 49% were supplemented in the dry season and 43% in the wet season. Large variations existed between the regions' supplementation strategies, with the Katherine and the Top End regions having the highest rate of supplementation.

Table 50. Percentage of livestock that were supplemented at different times of the year according to region

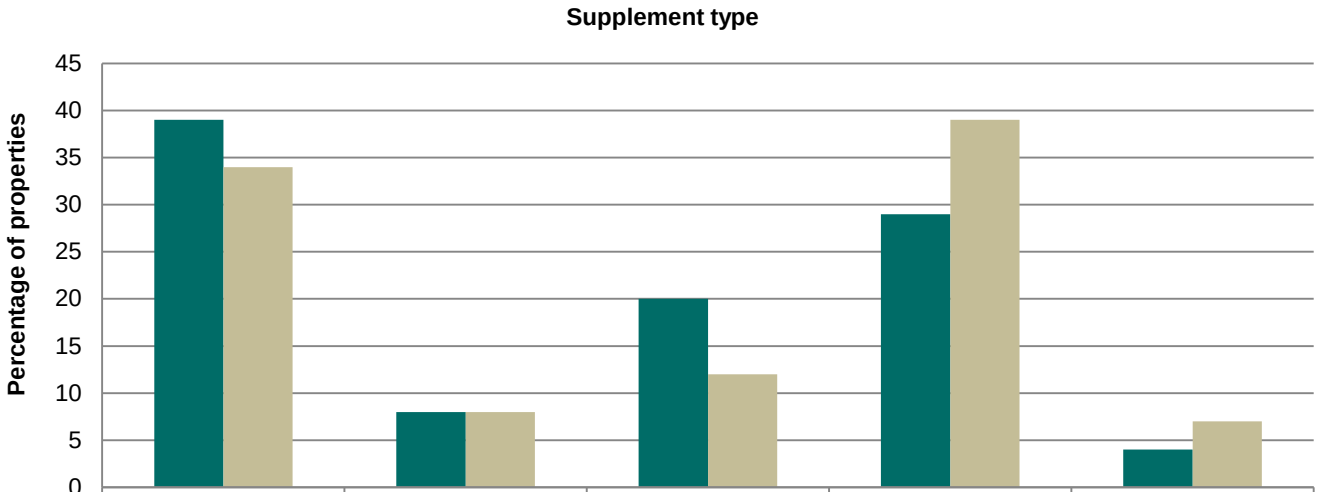
Region	Supplemented in the dry	Supplemented in the wet	Supplemented all year	Supplemented part of the year
Alice Springs	-	-	15	36
Barkly	35	35	11	-
Katherine	59	48	18	-
Top End	69	64	53	-
NT-wide	49	42	17	-

Figure 17 shows the stock classes and the supplement strategy employed by NT producers. Across the NT, breeders were most likely to receive both wet (39% of breeders) and dry (57% of breeders) season supplement. Yearling heifers were next most likely to receive dry season supplement (48%). Figure 17 shows the percentage of surveyed cattle that received a supplement and shows that 17% of NT cattle received a supplement year round.

	Altogether	Breeders	Breeding heifers	Sale steers	Weaners	Yearling steers	Yearling heifers
Dry	47	57	45	34	46	21	48
Wet	42	55	39	34	35	35	33
All year	17	25	15	12	14	13	12

Figure 17. Percentage of various stock classes supplemented at different times of the year

NT producers predominantly provided a loose mix in the wet and dry season, whether it was ready-mixed or custom-made (Figure 18). Alice Springs producers had a strong preference for blocks regardless of season.



	Block	Loose-home mix	Loose-ready mix	Loose-custom mix	Water medicators
Wet	39	8	20	29	4
Dry	34	8	12	39	7

Figure 18. Percentage of properties using different supplements in the wet and dry seasons

Seventy eight per cent of producers named phosphorus as the major nutrient they were supplying in the wet season. Sixteen per cent named both phosphorus and urea; the majority were Alice Springs producers. Fifty nine per cent of producers named urea as the main ingredient in their dry season lick, and 34% named both urea and phosphorus.

Producers who indicated they supplemented were asked to provide the 2010 cost per head for both wet and dry season supplements (Table 51). The average cost of a dry season supplement in the NT was $13.96/head while that of a wet season supplement was $13.23/head, making the average yearly expenditure on supplements in 2010

$27.19/head. There were marked differences between the regions with the lowest annual expenditure in 2010 in the Alice Springs region being $12.53/head and the highest in the Katherine region being $29.03/head.

Table 51. Supplement cost ($) per head in 2010 for the wet and dry season based on properties that supplemented

Region	Dry	Wet
Alice Springs	6.90	5.63
Barkly	12.70	14.68
Katherine	16.36	12.67
Top End	14.14	10.62
NT-wide	13.96	13.23

Near infrared reflectance spectroscopy (NIRS) faecal tests

Sixteen per cent of NT producers stated they were currently using faecal NIRS technology which involves analysing faecal samples to determine the nutritional value of grazed pastures. The highest use was on the Barkly with 38% of producers using the technology to guide their nutritional decisions, compared with 17% of Katherine producers, 15% of Top End producers and 3% of Alice Springs producers.

Nineteen per cent of NT producers had used it in the past but had since discontinued using it, with the highest proportion in the Katherine region. Most stated this was because they had already learned what they wanted to know about seasonal variation in nutrition on their country types, but some also mentioned they did not find it sufficiently useful and that it was too costly and time-consuming.

Production feeding

Fourteen per cent of producers in the NT stated they conducted some form of production feeding. This was mainly feeding weaners and yearling heifers proprietary mixes.

Hay production

Twenty one per cent of properties produced hay in 2010, mostly in the Katherine and Top End regions (Table 52).

Table 52. Number and percentage of properties in each region that produced hay in 2010

Region	No. of properties	Per cent of properties
Alice Springs	2	6
Barkly	3	23
Katherine	10	16
Top End	12	60
NT-wide	27	21

Generally, hay was produced for own use (Table 53), although it was also supplied to other pastoral properties, to cubing plants and to live cattle export yards.

Table 53. Percentage of properties growing hay for various purposes

Region	Purpose			
	Own use	Sale to other	Processing	Pastoral
Alice Springs	6	3	0	3
Barkly	23	0	0	0
Katherine	16	0	0	5
Top End	55	15	5	10
NT-wide	21	3	1	5

Hay was produced from native pastures (Table 54) and from improved pastures and fodder crops (Table 55). Production estimates were not provided by Alice Springs producers.

Table 54. Hay produced from native pastures in 2010

Region	Average property production (tonnes)	Number of properties
Alice Springs	-	-
Barkly	640	3
Katherine	400	1
Top End	0	0
NT-wide	580	4

Table 55. Hay produced from improved pastures and from fodder crops in 2010

Region	Average property production (tonnes)	Number of properties
Alice Springs	-	-
Barkly	0	0
Katherine	467	10
Top End	996	12
NT-wide	755	22

Animal health

Common problems

The most common animal health problems named by NT producers were buffalo flies (46%) and cattle ticks (39%). Regional variations occurred, with Alice Springs producers naming pink eye as most common and Barkly producers naming three-day-sickness in addition to buffalo flies.

Health treatments

Table 56 shows the percentage of producers who treated for various health and disease issues. The most commonly treated health problem in the NT was botulism, against which 84% of NT producers vaccinated. In line

with the importance placed on three-day-sickness on the Barkly, 31% of producers there vaccinated against the disease but few or none vaccinating against it in the other regions. See Appendix 3 for more detailed information on the percentage of properties vaccinating, and percentage of cattle vaccinated by class.

Table 56. Percentage of properties treating for various diseases or health issues

Health issue	Alice	Barkly	Katherine	Top End	NT-wide
Botulism	56	92	90	100	84
Worm control	16	38	65	69	52
Vibriosis	20	62	61	31	50
Tick control	0	8	58	69	41
Fly control	8	23	45	88	41
Wound antisepsis	10	38	39	56	36
Clostridial diseases	12	15	29	56	28
Lice control	20	15	32	25	27
Leptospirosis	12	8	13	38	16
Three-day-sickness	0	31	3	0	5
Red water fever	0	8	2	6	3
Pestivirus	4	0	3	6	3

Hormone growth promotants

Fifty three per cent of NT producers stated that they used some form of HGPs on their stock. Table 57 shows the variation in their use between the regions, with only 24% of Alice Springs producers using HGPs, but up to 85% in the Barkly region.

Table 57. Percentage of properties using HGPs according to region

Region	%
Alice Springs	24
Barkly	85
Katherine	56
Top End	56
NT Wide	53

Table 58 shows the major reasons for producers not using HGPs. Although there were regional differences, the major reason NT-wide was a lack of a clear financial benefit. In the Katherine and Top End regions, the major reason was the perceived lack of financial return. Market issues prevented some Alice Springs producers from using them, while on the Barkly, steers on the grower properties tended to be given HGPs rather than on the properties of origin. ‘Other’ reasons for not using HGPs included ‘they were given further down the chain’, ‘don’t believe they work’ and ‘don’t like the shape they give steers’.

Table 58. Percentage of producers stating various reasons for not using HGPs

Reason	%
Lack of benefit/cost	40
Market	27
Other	24
Opposed to hormones in food	15
Practicality	15

Grazing management

Carrying capacity

Producers were asked to provide an estimate of what they believed the current total carrying capacity of their properties was and, taking into account their plans for infra-structure development, what they thought it could be in five and ten years. Table 59 shows that the largest increases were predicted in the Katherine region, in line with previous data that showed the greatest potential for further development. Alice Springs producers predicted a slight decrease in five years' time, mostly due to the belief that the current run of good seasons would end and a decrease in numbers would be required. The average expected increase in carrying capacity on surveyed NT pastoral properties was 17% in five years and 25% in 10 years.

Table 59. Estimated current average carrying capacity and increase over time

Region	Average carrying capacity in 2010 (total head)	Estimated % increase by 2015	Estimated % increase by 2020
Alice Springs	6573	-1	5
Barkly	44 200	19	27
Katherine	13 452	22	31
Top End	8155	7	9
NT-wide	13 588	17	25

NT producers used a variety of ways to match stock numbers with paddock carrying capacity. Table 60 shows producers relied heavily on their previous experience relating to the season, paddock and numbers of stock that could be carried. Assessing stock condition was also an important measure. The Barkly region had the highest proportion of producers who measured feed on offer on an annual basis.

Table 60. Percentage of producers using various methods to assess feed availability

Method	%
Use historical information/experience	78
Look at condition of stock	69
Measure food on offer	26
Monitoring sites	13
Other	10
None	1
Grazing charts	0

Eighty eight per cent of producers assessed feed availability frequently through the year, with 13% saying they targeted the end of the growing season. Of this 13%, half said they made their stocking decision at the end of the growing season but then continued to monitor this through the dry season.

NT producers used a range of strategies to adjust stock numbers during the dry season in response to their observations of available feed (Table 61). Forty nine per cent of NT producers used the strategy of reducing numbers to match short-term carrying capacity when required. Herd management strategies employed to decrease numbers included culling more cows, selling steers earlier than planned, destocking and early weaning. Reducing the number of cows culled can also be a tool to increase numbers when required. Producers in the Top End with floodplains increased numbers to match carrying capacity in the dry season.

Other strategies mentioned to adjust stock numbers included rotational grazing and transferring young cattle to fattening properties.

Table 61. Percentage of producers using different strategies to adjust stocking rates during the dry season

Strategy	%
Reduce numbers to match carrying capacity	49
Cull cows	39
Early sale of steers	37
Early weaning	30
Other	21
Increase numbers to match carrying capacity	12
Do nothing	11
Destock	5

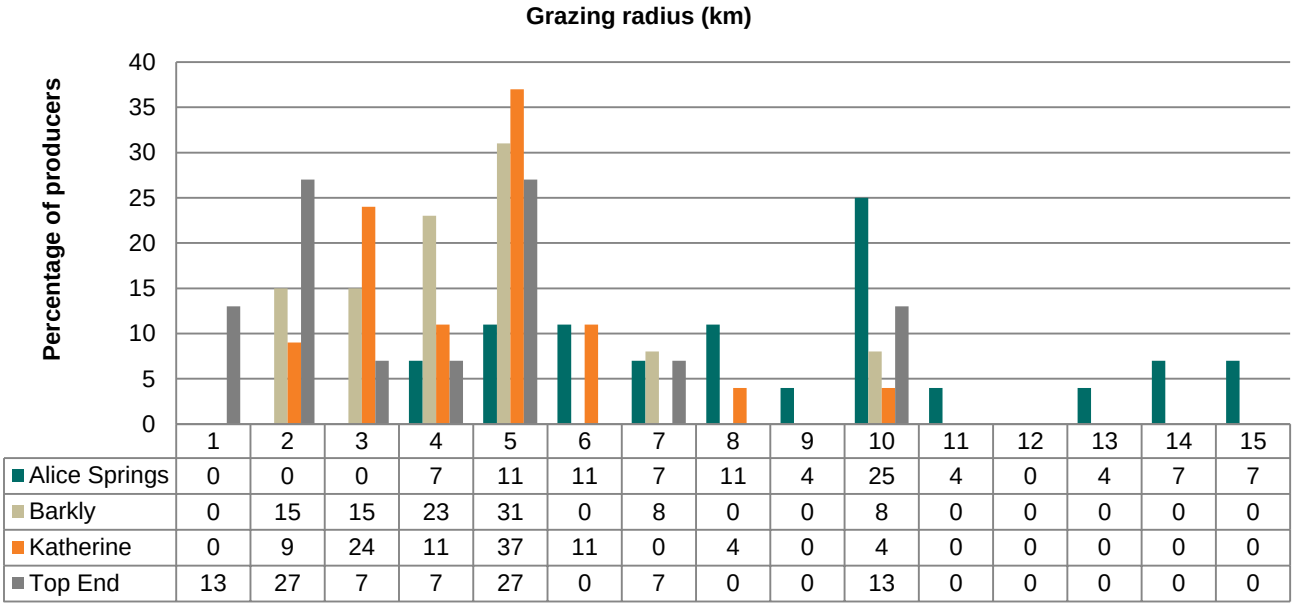
Water point development

The average maximum distance to water around which NT producers planned their infrastructure was 5.7 km (Table 62). This is affected by the productivity of the country and the intensity of development that can provide an economic return. There was a marked difference between the planned maximum distances by Alice Springs producers compared with the other NT regions.

Table 62. The average maximum distance to water around which producers planned infrastructure

Region	Average maximum distance to water (km)
Alice Springs	9.3
Barkly	4.5
Katherine	4.5
Top End	4.3
NT-wide	5.7

Figure 19 shows the variation in the preferred maximum grazing radius between the regions. The majority of Barkly and Katherine producers preferred maximum grazing distances of between 2 km and 5 km. Twenty five per cent of Alice Springs producers said they preferred a maximum of 10 km grazing radius and one producer preferred 20 km.



	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Alice Springs	0	0	0	7	11	11	7	11	4	25	4	0	4	7	7
Barkly	0	15	15	23	31	0	8	0	0	8	0	0	0	0	0
Katherine	0	9	24	11	37	11	0	4	0	4	0	0	0	0	0
Top End	13	27	7	7	27	0	7	0	0	13	0	0	0	0	0

Figure 19. Preferred maximum grazing radius when planning water points (percentage of producers)

Fifty nine per cent of producers thought that increasing water points was enough to disperse cattle more evenly through a paddock; however, 87% of producers said they also used other strategies to do so. The Top End was the only region where the majority did not agree that increasing water points alone was sufficient to disperse cattle. They commonly used fire, supplement placement and fences to achieve more even grazing of pastures.

Table 63 shows that the most commonly used methods to distribute grazing pressure more evenly in the NT were fences (53%) and fire (46%). 'Other' methods included the use of rotational grazing.

Table 63. Percentage of producers using different strategies to distribute grazing pressure more evenly

Strategy	%
Fences	53
Fire	46
Supplement placement	37
Rotating water points	25
Roads	11
Other	3

Grazing strategies

Sixty nine per cent of NT producers used a combination of grazing strategies, with the most common being continuous grazing and spelling.

Table 64 shows the percentage of NT properties that used the various grazing strategies. The most common strategies included a combination of rotational grazing and spelling in the Top End, continuous grazing and a combination of continuous grazing and spelling in the Katherine and Alice Springs regions, while the Barkly region tended to employ a broad range of strategies. Top End producers were more likely to undertake rotational grazing compared with the other regions.

Table 64. Percentage of producers using different grazing strategies

Strategy	%
Continuous grazing	67
Spelling	62
Rotational grazing	37
Time control/cell grazing	6
Other	4

Producers were asked if they purposely excluded some areas of their properties from continuous grazing. Fifty one per cent did; a lack of economic return from infrastructure development was cited as the most common reason (Figure 20). Exclusion for conservation reasons and the belief that the areas were unsuitable for grazing were also commonly mentioned by producers.

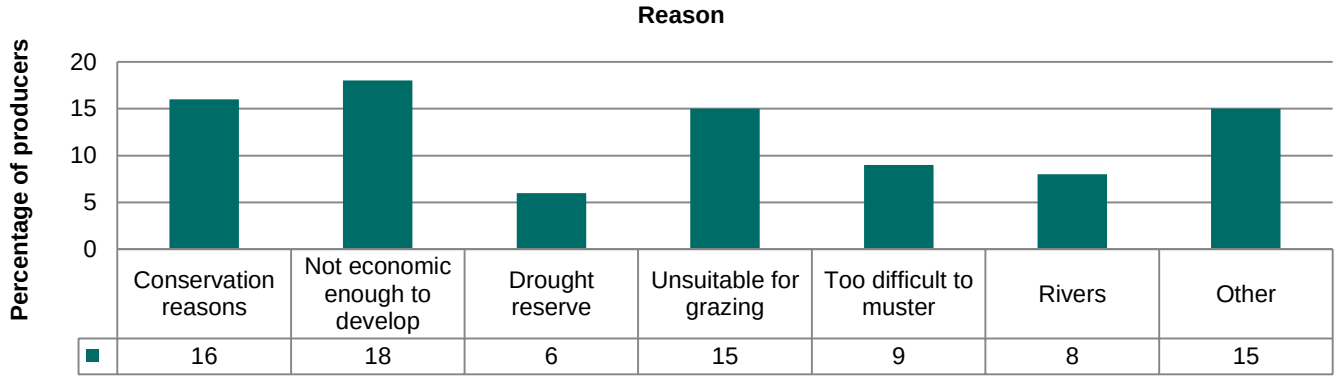


Figure 20. Reasons for excluding country from grazing

Fire

Based on producer estimates, 11% of the surveyed area was affected by wildfire in 2010 and 8% had been intentionally burnt for management purposes. Sixty six per cent of producers burnt for management purposes in 2010.

Table 65 shows that 75% of NT producers have used prescribed burning in the past, with wildfire mitigation and controlling grazing/removing rank pasture being the most common reasons.

The lowest frequency of prescribed burning occurred in the Alice Springs and Barkly regions. In both regions only 2% of the area was burnt intentionally in 2010. Eighty per cent of Top End producers stated they used fire as a management tool, predominantly to prevent wildfire.

Ninety-seven per cent of Katherine region producers stated they used fire as a management tool, largely to prevent wildfire, influence grazing patterns, remove rank pasture and prevent woody vegetation thickening. Sixty nine per cent of Barkly producers used fire as a tool to prevent wildfire, to influence grazing patterns and prevent woody thickening.

Table 65. Percentage of producers using fire for different management purposes in the NT

Purpose	%
Total who use fire for management purposes	75
Wildfire mitigation	51
Control grazing/remove rank pasture	43
Manage tree-grass balance	28
Control exotic weeds	9
Manage pasture composition	4
Maintain biodiversity	2

Survey participants who indicated they were using fire for a specific purpose were questioned further regarding the type of fire they aimed to use to achieve their management objective.

When burning for wildfire mitigation, most respondents aimed to have a cool fire in the early dry season. Barkly region producers were the exception as they stated they preferred to burn in the early wet season. All regions carried out annual wildfire prevention burns except for Alice Springs producers who on average only needed to conduct wildfire prevention burning every ten years or so, presumably following seasons of high pasture growth. Most NT producers burnt about 10 to 20% of their properties, with Top End producers aiming for the higher end of the scale.

When burning to control grazing/remove rank pasture, 45% of producers stated they burnt early in the wet season, except Alice Springs producers who preferred the mid-dry season and Top End producers who preferred the late wet until the middle of the dry season. Fifty per cent of NT producers said they were aiming for a cool fire, except Barkly producers who aimed for a moderate to hot fire. The frequency of burning averaged every one to two years with producers aiming to burn 9 to 30% of the lease (the lowest being in the Alice Springs and Barkly regions and the highest in the Top End and Katherine regions).

Five producers indicated they used fire to manage pasture composition with large variations in timing, frequency and intensity due to different target species.

Of those producers who used fire to manage the tree-grass balance, 53% said they burnt in the late dry season and 38% in the early wet season, particularly on the Barkly where 80% of those who burnt did so to manage woody species. Seventy-three per cent of those who burnt for this purpose were aiming for a hot fire every two years on between 5 to 30% of the lease.

Nine per cent of producers burnt to manage exotic weeds, generally using a hot, late dry season fire. Top End producers were more likely to burn in the early wet season for this purpose.

Three producers burnt specifically for biodiversity purposes and used a cool fire at varying times of the year.

Improved pasture

Forty three per cent of the properties surveyed had improved pastures (Table 66). The percentage of properties with improved pastures increased with increasing rainfall, from 12% in the Alice Springs region to 25% in the Barkly region, 51% in the Katherine region and 95% in the Top End region. The total area of improved pastures represented only 1.5% of the area of the properties surveyed.

Table 66. Areas of improved pastures on properties in each region

Region	No. of properties	Total area (km²) of improved pastures	% of region under improved pastures	% of properties with improved pastures
Alice Springs	3	350	0.3	12
Barkly	3	300	0.3	25
Katherine	31	4280	3.0	51
Top End	18	473	4.8	95
NT-wide	55	5404	1.5	43

The largest areas of improved pastures on properties were low-input or augmented pastures where seed was broadcast into native pastures (Table 67). The average areas were calculated only using those properties that had improved pasture. High-input pastures, where seed was sown into a prepared seedbed, were the next largest improved pasture type. There were smaller areas of irrigated pastures and pastures sown by using seed mixed in with a loose mix supplement. Six properties grew crops in 2010, three each in the Katherine and Top End regions. Five grew crop pastures for hay and one grew grain sorghum.

Table 67. Average area of sown pasture types and number of properties by region

Region	Pasture type							
	High input		Low input		Seed in loose mix		Irrigated	
	Av. area (ha)	No. of properties	Av. area (ha)	No. of properties	Av. area (ha)	No. of properties	Av. area (ha)	No. of properties
Alice Springs	0	0	30 000	1	0	0	40	1
Barkly	0	0	5000	1	0	0	0	0
Katherine	247	7	13 882	14	5450	2	2040	2
Top End	2081	17	2008	6	0	0	200	1
NT-wide	1546	24	10 973	22	5450	2	1082	4

Most producers used improved pastures to improve diet quality in native pasture systems (Table 68). Other uses were for hay production, improving diet quality in improved pasture systems and for special purpose pastures.

Table 68. Percentage of properties using improved pastures for various purposes

Improved pasture use	Alice	Barkly	Katherine	Top End	NT-wide
Improved diet quality in native pasture systems	0	33	61	56	55
Hay production	0	0	32	56	36
Improved diet quality in improved pasture systems	0	33	19	67	35
Special purpose areas (e.g. horse or holding paddock)	33	0	26	50	33
Rehabilitation (e.g. high erosion areas)	67	0	6	11	11
Other	67	33	3	6	9

The main pasture species and cultivars used in the regions are listed in Table 69. Buffel grass was the main grass and Seca stylo was the main legume.

Table 69. Main improved pasture cultivars used in each region

Cultivar	Alice Springs	Barkly	Katherine	Top End
Grass	Buffel grass	Buffel grass	Buffel grass	Tully
			Nixon sabi grass	Jarra finger grass
Legume	N/A	Verano stylo	Seca stylo	Seca stylo
		Seca stylo	Verano stylo	Wynn cassia

Producers in the Katherine and the Top End regions were asked about their intentions regarding pasture development (Table 70). More producers wanted to increase the amount of the pastures that they already had than to introduce new pastures, particularly in the Top End.

Table 70. Percentage of producers intending to increase improved pasture sowings or introduce improved pastures in the next 3 years

Intention	Katherine	Top End
Increase	29	80
Introduce	9	0
No change planned	62	20

Natural resource management

Native tree and shrub build up

Eighty two per cent of surveyed NT producers noticed a build-up of native shrubs and trees on their properties (Table 71). The largest occurrence has been re-growth on previously cleared areas in the Top End, but substantial numbers of producers have noticed a build-up on black and red soil land types. About one third of producers in all regions except the Barkly noted an increase of trees and shrubs on their river flats. 'Other' responses received were 'everywhere' in the Alice Springs region, and on floodplains and sandy country in the Top End.

Table 71. Percentage of producers stating woody thickening was occurring on various land types

Region	Yes	Black soil	Red soil	River flats	Regrowth on previously cleared areas	Other
Alice Springs	81	19	37	30	15	37
Barkly	77	38	38	0	0	0
Katherine	81	40	37	28	25	9
Top End	94	38	31	38	75	25
NT-wide	82	35	36	27	27	17

Weeds

A number of weeds impacted on pastoral production. Producers were asked to rate the impact of weeds as high, medium or low. The percentage of producers who rated weeds as having a high impact is presented in Table 72.

Overall, the most commonly-mentioned high impact weeds across the NT were Sida (14% of properties), Hyptis and Parkinsonia (13% of properties), Senna (11% of properties) and Rubber bush (10% of properties). The Alice Springs and Barkly regions had lower numbers of high-impact weeds and impacted properties than the Katherine and Top End regions.

Table 72. Percentage of properties in each region where the impact of weeds was rated high for the main weeds

Weed	Alice Springs	Barkly	Katherine	Top End
Athel pine	0	0	0	0
Barleria	0	0	2	0
Bellyache bush	0	0	2	0
Berrimah weed	0	0	0	0
Caltrop	0	0	0	0
Castor oil plant	0	0	0	0
Chinee apple	0	0	0	0
Crotalaria	0	0	2	0
Devil's claw	0	0	5	0
Grader grass	0	0	6	10
Hyptis	0	0	15	35
Kapok bush	0	0	5	0
Khaki weed	0	0	0	0
Lion's tail	0	0	2	0
Mesquite	0	0	0	0
Mexican poppy	4	0	0	0
Mimosa	0	0	0	30
Mimosa bush	0	0	15	0
Mission grasses	0	0	6	0
Mossman River grass	0	0	0	0
Noogoora burr	4	8	11	5
Parkinsonia	0	8	21	5
Rats tail grass	0	0	0	0
Prickly acacia	0	0	2	0
Rubber bush	0	31	11	5
Senna	4	0	6	40
Sida	0	0	13	45
Snakeweed	0	0	0	0

The average area of the properties affected by weeds listed in Table 72 is presented in Table 73.

Table 73. Average percentage of area affected by weeds in each region

Region	Average (%)
Alice Springs	9
Barkly	7
Katherine	10
Top End	26
NT-wide	9

Most producers controlled at least some weeds and a significant number controlled all weeds (Table 74).

Table 74. Percentage of producers who controlled some, all or no weeds

Region	Some	All	Do not control
Alice Springs	12	46	42
Barkly	62	38	0
Katherine	54	31	15
Top End	44	56	0
NT-wide	44	39	17

The amount spent on weed control per unit area was significantly higher in the Top End region compared with the other regions (Table 75).

Table 75. Amount spent annually on weed control per property and per square kilometre

Region	Average $ /property	Median $/property	Median $/km^2
Alice Springs	1332	0	0.00
Barkly	38 384	15 000	2.40
Katherine	11 938	6500	4.80
Top End	52 947	30 000	45.50
NT-wide	20 884	5000	3.90

Most producers used a number of methods to prevent the introduction of weeds to their properties (Table 76).

Table 76. Percentage of producers using different methods to prevent the introduction of weeds

Method	Region				NT-wide
	Alice Springs	Barkly	Katherine	Top End	
Buy certified hay/seed	20	15	34	20	26
Feed out purchased hay in designated areas	33	23	42	10	33
Quarantine animals purchased off-property	7	62	39	15	30
Quarantine machinery and equipment	10	38	19	20	19
Restrict access to off-property machinery and vehicles	3	23	24	20	18
Use own hay	13	38	18	30	21
Use wash down bays	7	23	19	20	17
Other	7	15	8	0	8

Pest animals

A number of pest animals impact on pastoral production in the NT. Producers were asked to rate the impact of the animals as high, medium or low. The percentage of producers who rated various pest animals as having a high impact is presented in Table 77. Overall, the pest animals perceived to have the highest impact across the NT were wild dogs (impacting 63% of properties), kangaroos and wallabies (28% of properties) and pigs (17% of properties). Most producers controlled some or all pest animals. Buffalo are livestock to some producers in the Top End region and camels are seen as beneficial by some producers in the Alice Springs region.

Table 77. Percentage of properties where pest animal impact is rated high for the main pest animals in the NT and the percentage of properties that controlled them

Pest	Alice Springs	Barkly	Katherine	Top End	% controlling NT-wide
Buffalo	N/A	0	5	10	53
Camels	24	0	2	N/A	57
Crocodiles	N/A	N/A	N/A	5	*see note
Donkeys	0	8	8	5	63
Horses	10	0	3	0	45
Kangaroos/wallabies	17	0	0	27	12
Pigs	0	8	13	60	61
Rabbits	7	0	2	N/A	13
Wild dogs	67	62	74	25	93

*Only Top End producers were asked

Annual expenditure for pest control is outlined in Table 78. Most producers controlled some or all pest animals (Table 78).

Table 78. Amount spent per year on pest animal control per property and per square kilometre

Region	Average $/property	Median $/property	Median $/km^2
Alice Springs	7698	5000	1.17
Barkly	3346	3000	0.50
Katherine	6687	3250	2.17
Top End	3516	2000	4.76
NT-wide	6053	3000	1.62

Climate change

Producers were asked whether they thought climate change would affect their businesses (Table 79). Thirty three per cent of producers responded yes it would, either through negative production or, of those who did not believe in climate change, through the increased costs associated with government schemes and taxes to reduce emissions.

Table 79. Producer beliefs about climate change

Will climate change affect your business?	%
I don't know enough about climate change to say	23
No - I believe in climate change but I don't think it will affect my business	14
No - I don't believe in climate change	30
Yes	33

Business management

Staff

Word of mouth was the most common form of recruitment for NT producers (Figure 21). Barkly producers tended to use online advertising more and producers from company properties tended to use the widest range of methods and were least likely to use word of mouth. 'Other' methods largely consisted of recruiting family and friends.

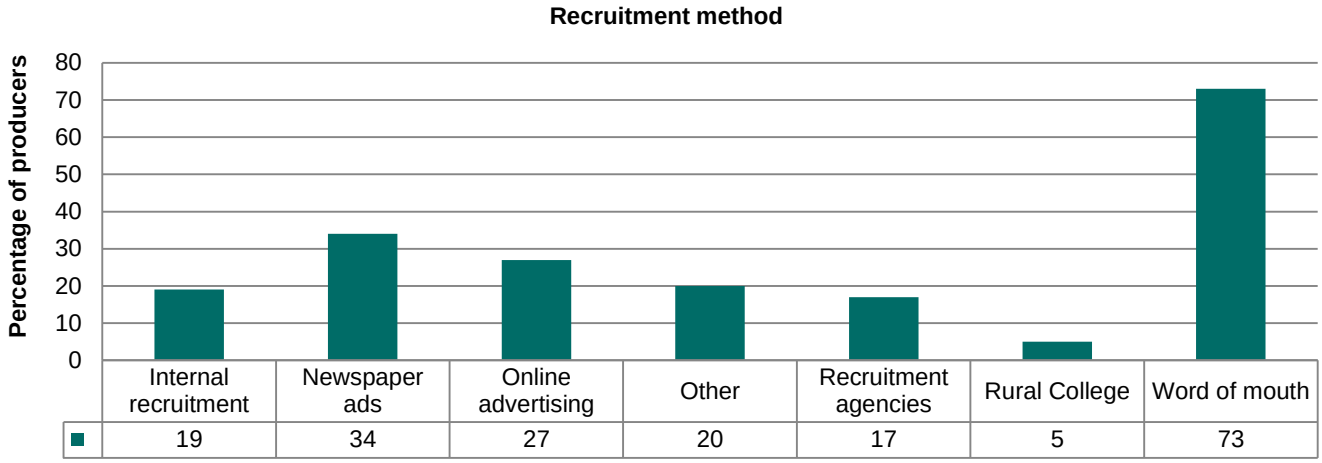


Figure 21. Percentage of producers sourcing labour through different recruitment methods

Staff training was undertaken by 87% of properties. The predominant form of training was informal on-the-job training (80% of properties.) Forty per cent of NT properties put staff through formal non-accredited training and 28% put staff through formal accredited training. Table 80 also shows the percentage of workers in the NT who received different types of training. Companies were far more likely to provide formal accredited and non-accredited training to staff. There was no effect of ownership type on the likelihood of staff receiving informal training.

Table 80. Percentage of properties that provided training and percentage of workers who received different types of training

Training type	Properties	Workers
Formal accredited	28	24
Formal non-accredited	40	20
Informal/on the job	80	83

Table 81 shows the different types of training courses that staff on NT properties attended. Livestock handling and horsemanship were the most popular types of staff training.

Table 81. Percentage of properties putting staff through different training courses

Type of training	%
Livestock handling	59
Horsemanship	40
Grazing land management	36
Pregnancy testing	34
Other	26
ChemCert	22
Business management	19
Nutrition EDGE	19
First Aid	19
Bull selection	16
Monitoring	15
Breeding EDGE	14
Rangeland management	14
Working dogs	12
Shoeing	8
Certificate in Ag	7
Mechanics	7
Welding	5
Bushfires training	5
1080 baiting	5

Succession planning

Of the NT producers who stated succession planning was of relevance to them, 33% had a succession plan in place, 41% did not and 24% had a plan in progress.

Those who neither had a plan in place nor in progress listed such reasons as ‘young children’, ‘hadn’t gotten around to it’, ‘too many family members to make succession viable’ and ‘doubts over the future of the industry’ as reasons for not having a plan in place.

Benchmarking and planning

Seventy four per cent of NT producers had some form of documented management plan (Table 82). The most common form of plan was a financial or business management plan.

‘Other’ included environmental management systems, property management plans, quality assurance plans, grazing plans, weed plans and stock plans.

Table 82. Percentage of producers with various management plans in place

Type of plan	%
Financial/business management	65
OH&S	42
Natural resource management	25
Human resource management	21
Other	9

Sixty eight per cent of NT producers used financial and/or production benchmarks to guide management (Table 83). Of those who did not currently use them, 54% thought that they would be useful. 'Other' production benchmarks that were mentioned included weaning weight, sale weight, body condition score, cash surplus or profit, and staff turnover rate.

Table 83. Percentage of producers who used specific financial and production benchmarks

Benchmark	%
Weaning %	56
Cost of production per kg	28
Return on assets	23
Kg beef turned-off per ha	18
Other	18
Gross margin per AE	15
Kg beef turned-off per AE	14
N/A	1

Seventy nine per cent of NT producers used benchmarks to guide their natural resource management (NRM) (Table 84). The most common forms of NRM benchmarks were rainfall records (55%) and grazing records (40%). 'Other' benchmarks mentioned included pasture yield, cover levels, fire-scar mapping, land and cattle condition, CSIRO fire monitoring and Land Council monitoring.

Table 84. Percentage of producers who used benchmarks to guide natural resource management

NRM Benchmark	%
Rainfall records	55
Grazing records	40
Weed maps	35
Photo monitoring sites	30
Other	10
Residual yield	10
Tier 2 monitoring	0
VegMachine	0

Financial

Forty one per cent of producers had income sources other than their cattle enterprise (Table 85). Twice as many producers in the Top End region (65%) had another income source compared with other regions, with the Barkly having the lowest at only 23% of properties.

Hay production and tourism were the most common enterprises other than cattle, with 15 properties being engaged in each venture. 'Other' enterprises included a road house, meatworks, seed production, medical practice, goats and machinery contracting.

Table 85. Types of enterprises besides cattle

Enterprise type	No. of properties
Hay production	15
Tourism	15
Other	10
Station store	7
Horticulture	5
Mining production	5
Mining exploration	5
Crocodile egg collection	4
Mixed farming	3
Helicopter business	3
Livestock transport	2
Breeding horses	2

The most common source of finance for NT producers was the NT branch of a major trading bank (Table 86). 'Other' forms of finance mentioned include privately financed and the Indigenous Land Corporation.

Table 86. Percentage of producers who used different finance sources

Source of finance	%
Major trading bank, NT branch	22
Major trading bank, interstate branch	21
Don't know	15
Agribusiness (e.g. Landmark, Elders)	14
N/A	12
Agricultural bank	10
Other	7

Information delivery and management

NT producers used a wide variety of technology and information sources to assist them in managing their businesses (Table 87).

Table 87. Percentage of producers using different types of technology

Type of technology	%
Email	81
Bureau of Meteorology	80
Internet	80
Fire scar and hot spot websites	69
Excel	63
Electronic bookkeeping	51
Electronic ID of animals	42
Electronic herd recording programs	24
Recording programs	9
Other	9
Electronic herd modelling programs	8
Remote water point monitoring	4

Producers were asked where they sought information about the pastoral industry. Table 88 shows that a wide range of traditional sources was used. The high figures for advice from other producers and from Internet use were also notable.

Table 88. Percentage of producers using different sources for information about the pastoral industry

Information source	% producers
Publications	80
Other producers	74
Internet	72
Field days	63
Training courses	59
Producer groups	54
DPIF extension officers	50
Radio	43
Other	7

Table 89 shows that *Queensland Country Life* was read by most NT producers. DPIF publications were read by 54% of producers and Meat and Livestock Australia publications were read by 51% of producers.

Table 89. Percentage of producers who read different publications

Publication	%
Queensland Country Life	85
DPIF publications	54
MLA	51
DPIF newsletter	49
NQ Register	24
Farm Journal	20
Stock Journal	20
The Land	18
Farm Weekly	12
Countryman	9
Other	9

Priorities

What were the hurdles faced by the pastoral industry?

The major hurdles in running NT pastoral businesses were identified as staff availability (24%), roads and lack of access (19%), market issues (19%), cost of production (17%), seasons (13%) and government regulations (9%). Seasonal and climatic issues were generally raised more often as hurdles in the Alice Springs and Barkly regions, and market issues were more of a problem in the north. The full list of hurdles is in Appendix 4.

Producers were asked to identify the main issues that affected the profitability of their enterprises so as to gain an understanding of the major constraints facing pastoral enterprises. Appendix 5 shows that cost of production, market access, reproductive performance, and cost and price issues were the most common.

Producers were also questioned about the main issues that affected their environmental sustainability; 30% responded that weeds presented the greatest risk. Other frequent answers included feral animals (16%), drought/poor seasons (13%) and government regulations was next most common at (12%). Appendix 6 shows the range of responses provided by NT producers.

What were the plans for infrastructure development?

To gauge the plans for future development in the NT, producers were asked to provide their priorities for infrastructure development (Table 90). Water point development was the highest priority for 52% of NT producers, with paddock subdivision the second highest priority for 19% of producers.

Table 90. Priorities for infrastructure development (percentage of producers)

NT-wide	Priority 1	Priority 2	Priority 3
Water point development	52	21	7
Paddock subdivision	19	24	12
Other	8	2	2
Boundary fencing	5	9	9
Laneways	5	9	14
Roads	4	8	13
Drafting yards	3	12	11
Trap yards	2	6	8
Telemetry	1	0	2
Accommodation	0	3	9
Sheds	0	0	0

What were the risks to long-term sustainability?

To gain an understanding of what producers felt were the greatest risks to the long-term sustainability of the NT pastoral industry, they were asked to rank a series of issues in terms of risk. The greatest risk identified was market issues, with 42% of producers naming this as the biggest risk to sustainability. Government regulations (27%) and cost of production (22%) were also frequently named as the greatest risk. Appendix 7 shows the full breakdown of producer rankings against each of the named risks.

What motivated people to be part of the pastoral industry?

Fifty four per cent of NT producers who answered this question said they were involved in the pastoral industry primarily for the lifestyle. Other major motivations included enjoying the work and because their families were involved in the industry.

Table 91. Why do NT producers choose to be a part of the pastoral industry?

Reason	% producers
Lifestyle	54
Enjoy/love it	35
Born into it/family business	19
Like cattle and horses	15
Challenging occupation	13
Contributing to the community/making a difference	13
Not for the money!	10
Interesting occupation	6
All I know	4

How the NT pastoral industry has changed between 2004 and 2010

It is difficult to make some comparisons between the 2004 report and this report due to a number of differences in the method of data analysis and changes in the sample. This section of the report highlights the key differences, based on knowledge of the sample and methodology.

Differences in sample

In the 2004 report there was a Gulf district in the Katherine and Barkly regions, with the eastern Gulf included in the Katherine region and the western Gulf included in the Barkly region. In the 2010 survey, the Gulf district was included in the Katherine region only. Table 92 shows the number of properties surveyed by region in each of the surveys and the percentage of the area that these surveyed properties represented.

Table 92. Differences in sample population between 2004 and 2010 pastoral surveys

Region	Number of properties surveyed		Area surveyed (km^2)	
	2004	2010	2004	2010
Alice Springs	40	31	151 498 (64%)	117 756 (50%)
Barkly	24	13	161 893 (80%)	86 488 (51%)
Katherine	61	61	136 744 (62%)	140 609 (61%)
Top End	25	20	20 680 (71%)	9948 (29%)
NT-wide	149	127	465 401 (72%)	354 801 (53%)

Property size and infrastructure

The average property size has somewhat decreased in the NT from 3122 km^2 in 2004 to 2794 km^2 in 2010. Sample differences between surveys may have had some effect. For example, a major pastoral holding in the Top End was not surveyed in 2010, which had a large effect on the percentage of area surveyed compared with 2004. However, a number of property subdivisions have occurred since 2004, which would have reduced average property sizes as well.

The Barkly region has seen the most water point development, increasing from 56 man-made water points to 90 per property. The other regions did not report large increases; however, this could be affected by sample size differences. Priorities for infrastructure development remain the same, with water points the first priority and paddock subdivision the second priority.

Ownership

There were differences in ownership, with a greater percentage of owner-manager properties and a lower percentage of privately-owned properties with a manager in 2010. The percentage of properties that were company-owned has decreased slightly from 25% to 22%. The length of time owning and/or managing properties remains very similar when comparing averages (the median was reported in the 2010 survey and cannot be compared directly with the 2004 report).

Markets and turn-off

As a result of the Indonesian 350-kg weight limit restriction, there have been changes in market destinations. In 2010, 55% of producers indicated they sent cattle to abattoirs, compared with 38% in 2004. A larger percentage of cull cows and bulls were going to southern abattoirs with a freight cost of around $150 per head in 2010. This significantly affected profitability for Katherine and Top End producers.

Cattle management

The most common herd size remained the same at 2000 to 5000 head and company-owned properties still managed the largest herds.

There was an increased emphasis on selecting traits within a breed. However, a decrease was noted in the number of producers indicating they were upgrading their herd to Brahman: 10% in 2010 compared with 15% in 2004.

There has been an increase in the number of properties carrying out three mustering rounds with the majority of producers still undertaking two rounds per year. Mustering methods have remained similar, with the greatest change being in the increased use of motorbikes for mustering (from 60% in 2004 to 75% in 2010).

The average bull percentage used by NT producers has decreased from 4.3% in 2004 to 3.6% in 2010. There has been a marked increase in the number of producers breeding their own bulls (24% in 2004, 36% in 2010). The number of producers sourcing bulls from Queensland dropped from 60% in 2004 to 56% in 2010.

There was an increase in producers segregating breeders based on pregnancy status and a 23% decrease in segregation based on age. There was a 10% increase in the number of producers who pregnancy tested.

More producers weighed heifers prior to joining and made selection decisions on heifers after joining (that is selecting heifers based on their reproductive performance). Conformation and temperament were still considered the most important traits when selecting heifer replacements.

As in 2004, similar numbers of producers in 2010 in the Katherine, Alice Springs and Top End regions were attempting to control-mate a proportion of their mature breeders. The Barkly region has seen an increase in the number of producers attempting to use control-mating, from 4% (one producer) in 2004 to 15% (2 producers) in 2010.

There was a decrease in the percentage of producers supplementing (92% in 2004 compared with 80% in 2010). Dry season supplementation was still more common than wet season supplementation. Hay production decreased between 2004 and 2010 (36% compared with 21% of properties).

Animal health

There was little change in the perceived major animal health problems between the surveys. In 2004, the most commonly mentioned problems were botulism, cattle ticks and buffalo flies. In 2010, cattle ticks and buffalo flies stood out as the more commonly seen problems. A very high percentage of producers vaccinated against botulism in both surveys, suggesting that botulism was a well-recognised and prevented animal health problem. There was a marked decrease in HGP usage in the Top End (72% down to 56%) and Katherine (83% down to 56%) regions, and an increase in the Barkly region from 71% to 85%.

Weaning and mortality rates

While it is difficult to compare between the 2004 and 2010 surveys due to weighting of the 2010 data, the estimated average weaning percentage as reported by NT producers had decreased slightly from 72% in 2004 to 67% in 2010. A marked decrease has occurred in the estimates given by Top End and Katherine region producers from 71% (Katherine) and 70% (Top End) to 61% for both. It would not be expected that the production had decreased by this magnitude and was more likely a result of producers keeping improved records allowing them to better estimate production benchmarks. Furthermore, between the surveys several large scale female fertility benchmarking projects were carried out in the NT, which highlighted that properties were achieving lower weaning rates than they had realised and the projects may have informed producer estimates.

Average breeder mortality estimates had generally increased, with the largest in the Alice Springs region (3% in 2004 to 8.5% in 2010). The Barkly was the only region which reported a decrease, from 3.5% in 2004 to 3% in 2010. Breeder mortality is a very difficult benchmark to calculate and the fact that estimates have increased through time is probably also attributable to improved record keeping rather than to an actual increase in mortality.

Grazing land management

Based on unweighted data (not reported) the 2010 producer estimates of expected increases in carrying capacity in five and 10 years' time was less than in 2004, reflecting both a decrease in industry confidence but also the amount of development that has been achieved since 2004. The average estimate of increase in carrying capacity planned for NT properties over five years was 22% in 2010 and 29% in 2004. In 2010, producers estimated a 36% increase in carrying capacity in 10 years' time; in 2004 however, producers estimated a 54% increase in carrying capacity.

There was no significant change in preferred distance to water.

In 2010, woody thickening was not listed as one of major issues affecting environmental sustainability or profitability; however, similar numbers of producers in 2010 (82%) mentioned they had noticed a build-up of woody trees and shrubs on their properties as in 2004 (79%). In 2004, woody thickening was a topic of concern and was listed as one of the major issues by a number of producers.

There has been a slight increase in the number of producers who stated they had planted improved pastures, from 35% in 2004 to 43% in 2010. The most significant increase in reasons for using improved pasture was for improved diet quality in a native pasture system (a 19% increase), hay production (a 21% increase) and improved diet quality in improved pasture systems (a 25% increase).

There were some changes in weed control and weed impact ratings. Additional weeds mentioned as having a high impact included Grader grass, Noogoora burr and Kapok bush. Expenditure on weed and pest animal control had generally increased since 2004.

Wild dogs were rated much more highly in 2010 as having a negative impact and were seen as a major issue affecting productivity. The average cost of controlling pest animals for an NT producer had increased from $4928 in 2004 to $6053 in 2010.

Business management

In 2010, 74% of NT producers stated they had some forms of written property management plans compared with 43% in 2004. There was also an increase in the number of producers who said they had some other forms of income other than cattle production (33% in 2004 compared with 41% in 2010).

In 2010, 42% of NT producers mentioned they used electronic identification of animals to aid their management decisions compared with 13% in 2004.

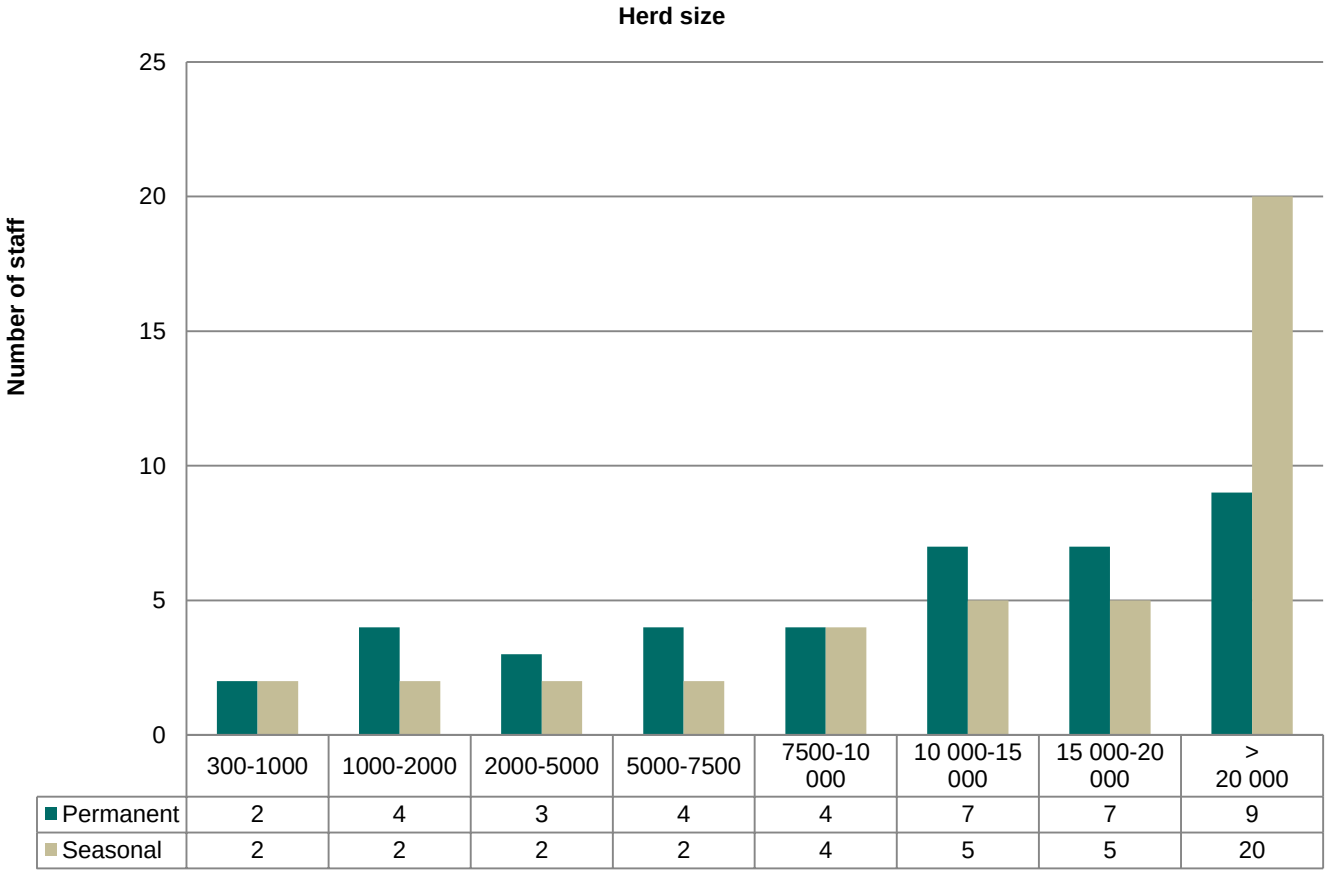
Issues affecting profitability

An increasing number of producers mentioned market access and instability, cost of production and production issues as issues affecting profitability in 2010 compared to 2004. Government regulations and wild dogs were not mentioned in 2004 but did feature in 2010. In general, issues affecting environmental sustainability were not mentioned as frequently as they were in 2004. The key change in factors that affected environmental sustainability was a marked increase in the number of producers (27%) who named pest animals as the most significant issue in 2010, compared with only one producer in 2004. Weeds, government regulations and the ability to manage in a variable climate remained significant factors.

Finding and retaining staff was the major hurdle facing producers in 2004. In 2010, market issues, roads and cost of production/cash flow were considered to be greater challenges.

Lifestyle continues to be the major factor mentioned as to why NT producers chose to be members of the pastoral industry.

Appendix 1 – Average number of staff employed per station compared to total herd size



	300-1000	1000-2000	2000-5000	5000-7500	7500-10 000	10 000-15 000	15 000-20 000	> 20 000
Permanent	2	4	3	4	4	7	7	9
Seasonal	2	2	2	2	4	5	5	20

Appendix 2 – Number of staff employed according to region

Region	Average number of staff employed	Total permanent workers employed on surveyed properties in 2010	Total seasonal workers employed on surveyed properties in 2010
Alice Springs	6	91	89
Barkly	27	219	217
Katherine	8	214	315
Top End	5	42	54
NT-wide	9	566	585

Appendix 3 – Percentage of properties vaccinating and percentage of cattle vaccinated by class

Botulism

Region	% properties vaccinating		% cattle vaccinated
	Vaccinating any stock	Vaccinating all stock	Total head
Alice Springs	56	36	64
Barkly	92	85	92
Katherine	90	89	93
Top End	100	94	94
NT-wide	84	78	83

Vibriosis

Region	% properties vaccinating				% cattle vaccinated	
	Vaccinating any stock	Bulls only	Bulls and heifers	Heifers only	Bulls	Maiden heifers
Alice Springs	20	12	8	0	18	7
Barkly	62	31	31	0	67	38
Katherine	61	44	13	5	61	19
Top End	31	13	6	13	11	23
NT-wide	50	31	13	4	57	25

Clostridial diseases

Region	% properties vaccinating		% cattle vaccinated		
	Vaccinating any stock	Vaccinating all stock	Total head	Weaners	Breeders
Alice Springs	12	8	19	15	23
Barkly	15	0	1	3	0
Katherine	29	8	11	21	5
Top End	56	19	18	34	21
NT-wide	28	9	8	15	5

Appendix 4 – Percentage of producers mentioning major hurdles in running a cattle enterprise

Hurdle	NT-wide	Alice Springs	Katherine	Top End	Barkly
Staff availability	24	29	18	20	43
Roads/access	19	13	18	35	14
Market issues	19	0	24	35	14
Cost of production	17	16	15	10	43
Seasons	13	26	8	5	21
Government regulations	9	13	8	15	0
Other	9	13	8	0	21
Managing in a tropical environment	9	3	13	5	7
Freight	8	10	5	5	21
No response	7	13	8	0	0
Fertility of herd	6	3	5	10	7
Water	6	3	5	0	21
Dingoes	6	6	6	5	0
Weeds	5	6	2	10	7
Time	5	0	5	10	7
Live export uncertainty	5	0	6	10	0
Pest animals	3	3	3	5	0
Money	3	0	5	5	0
Infrastructure	3	0	5	0	7
Cash flow	3	0	6	0	0
Distance	2	0	2	5	7
Scale	2	3	2	0	0
Cattle control	2	3	3	0	0
Erosion	2	0	3	0	0
Fire	2	0	3	0	0
Isolation	2	0	3	0	0
Communication and education	1	0	0	5	0
Lack of government support	1	3	0	0	0
No major hurdles	1	3	0	0	0
Trespassers	1	3	0	0	0
Cattle prices	1	3	0	0	0
Topography	1	0	0	5	0
Management of floodplains	0	0	0	3	0

Appendix 5 – Main issues affecting profitability of cattle businesses

Issue	% of producers mentioning
Cost of production	34
Market access/instability	28
Government regulation/policy	15
Live export ban	13
No response	13
Poor reproductive performance/fertility	13
Cattle prices	11
Freight/transport costs	11
Feral animals	8
Other	8
Roads	8
Climate/Weather	6
Fuel cost	6
Staff	6
Inherent productivity of land	6
Infrastructure	4
Land value	4
350 kg limit	2
Interest rates	2
Clearing	3
World economy	2
Cash flow/profitability	2
Weeds	2
Age	2
Gidgee poisoning	2
Poor live weight gain	2

Appendix 6 - Main issues affecting the environmental sustainability

Issue	% of producers mentioning
Weeds	30
Feral animals	16
Drought/seasonal conditions	13
Other	12
Government	12
Erosion	9
Cost of development	6
Stocking rates	6
Not an issue/N/A	5
Wallabies	5
Wildfire	5
Land clearing	4
Land condition	4
Viability/profitability	2
Access/people coming on property without permission	2
Poor country	2
Gidgee poisoning	2
Dingoes	2
Camels	2
Woody thickening	2
Grazing management	2
Not enough water points	2

Appendix 7 – Prioritising of long-term risks to sustainability

NT-wide	1	2	3	4	5	6	7	8	9	10
Markets	35	20	14	5	6	3	3	1	0	0
Government regulations	23	11	12	8	8	12	10	3	1	0
Cost of production	18	21	23	20	6	2	0	1	0	0
Seasonal variability	15	8	6	13	11	12	7	3	2	0
Cattle prices	9	14	24	15	11	5	1	1	1	0
NRM Issues	3	3	2	6	12	13	16	13	3	0
Other	2	6	0	1	2	1	0	0	0	0
Energy availability	1	0	4	3	3	6	13	25	10	0
Staff	1	7	4	11	16	15	8	6	1	1
Climate change	0	2	0	1	0	2	4	8	39	5

Appendix 8 – Index of scientific names

Grass species

Common or Cultivar name	Scientific name
Buffel grass	*Cenchrus ciliaris*
Flinders grass	*Iseilema fragile, I. vaginiflorum*
Jarra finger grass	*Digitaria milanjiana*
Kangaroo grass	*Themeda triandra*
Mitchell grass	*Astrebla lappacea, A. pectinata*
Nixon sabi grass	*Urochloa mosambicensis*
Ribbon grass	*Chrysopogon latifolius*
Sorghum (perennial), plume sorghum	*Sarga (Sorghum) plumosum*
Tully, humidicola	*Urochloa (Brachiara) humidicola*

Legume species

Common or Cultivar name	Scientific name
Seca stylo	*Stylosanthes scabra*
Verano stylo	*Stylosanthes hamata*
Wynn cassia	*Chamaechrista rotundifolia*

Tree species

Common name	Scientific name
Acacia	*Acacia holosericea, Acacia* spp
Bloodwood	*Corymbia* spp.
Chenopod	*Chenopodium* sp.
Eucalyptus	*Corymbia* spp.*, Eucalyptus* spp.
Gidgea	*Acacia cambagei*
Mulga	*Acacia aneura*

Weed species

Common name	Scientific name
Athel pine	*Tamarix aphylla*
Barleria	*Barleria prioritis*
Bellyache bush	*Jatropha gossypifolia*
Berrimah weed	*Mitracarpus hitrus*
Caltrop	*Tribulus* spp
Castor-oil plant	*Ricinus communis*
Chinee apple	*Ziziphus mauritiana*
Crotalaria	*Crotalaria goreensis, Crotalaria* spp.
Devil's claw	*Martynia annua*
Grader grass	*Themeda quadrivalvis*
Hyptis	*Hyptis suaveolens*
Kapok bush	*Aerva javanica*
Khaki weed	*Alternanthera pungens*
Lions-tail	*Leonotis nepetifolia*
Mesquite	*Prosopsis limensis*
Mexican poppy	*Argemone ochroleuca*
Mimosa	*Mimosa pigra*
Mimosa bush	*Acacia farnesiana*
Mission grass (annual)	*Cenchrus pennisetiformis (Pennisetum pedicellatum)*
Mission grass (perennial)	*Cenchrus polystachios (Pennisetum polystachion)*
Mossman River grass	*Cenchrus echinatus*
Noogoora burr	*Xanthium occidentale*
Parkinsonia	*Parkinsonia aculeata*
Rats tail	*Sporobolus* spp
Prickly acacia	*Acacia nilotica*
Rubber bush	*Calotropis procera*
Senna (Candle bush)	*Senna alata*
Senna (Sicklepod)	*Senna obtusifolia*
Senna (Coffee senna)	*Senna occidentalis*
Sida (Spiny-head sida)	*Sida acuta*
Sida (Flannel weed)	*Sida cordifolia*
Sida (Paddy's Lucerne)	*Sida rhombifolia*
Snakeweed	*Stachytarpheta* spp.