Barkly Beef

DEPARTMENT OF PRIMARY INDUSTRY AND RESOURCES

DECEMBER 2017

Inside this issue:

Congratulations Helen Kempe – nominee for Senior Territorian of the Year

Since starting out as a governess at Phillip Creek Station half a century ago, Helen Kempe has thrown her heart and soul into life on the Barkly Tablelands she calls home. Known for her generous spirit, warm empathy for bush people and willingness to roll up her sleeves, Helen is the vice-president of her chapter of the Country Women's Association. She's run everything from sausage sizzles to rodeos, campdrafts to cake stalls, and is a stalwart in organisations as diverse as the Tennant Creek Saddle Horse Club and the Isolated Children's and Parents Association.

A passionate photographer, Helen's collection captures life in the Australian outback. She juggles her busy voluntary agenda alongside a full-time job as the Executive Officer in the Department of Primary Industry and Resources (DPIR) Barkly office.

Helen has been a central point of contact for isolated people on the Barkly for decades. With all of this in mind, Miss Helen was nominated for the 'Senior Territorian of the Year' award. The winners were announced in November, unfortunately, despite our best well wishes, Helen did not take out the title, which was won by Kathy Guthadjaka, an educator and pioneering academic from northeast Arnhem Land.

Figure 1 Helen Kempe (DPIR) was nominated for Senior Northern Territorian of the Year and Frank Shadforth (Seven Emu) was nominated for Territorian of the Year.

The Barkly DPIR team would like to congratulate Miss Helen on receiving this great honour. Thanks for all of your hard work over the years!

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NORTHERN TERRITORY GOVERNMENT

Congratulations are also due to Frank Shadforth, owner of Seven Emu Station who was nominated as Territorian of the Year for his work mentoring and teaching Aboriginal people. This category was won by Dr Bo Remenyi, a Paediatric Cardiologist who is researching ways of combatting the Territory's high rate of Rheumatic Heart Disease.

Planning some paddock development? Pros and cons of common approaches on the Barkly

Dionne Walsh, Rangeland Program Manager, DPIR

It's an exciting time to be working in the beef industry in the Barkly region as we witness a once-in-a-generation injection of capital into infrastructure development. Many people are looking over the fence and asking "should we be doing that too?" Let's review some of the common approaches towards water and paddock development and the pros and cons of each.

Before deciding what you're going to do, it pays to understand what you are trying to achieve. The motivations of your neighbour might not be the same as yours, so your infrastructure program may need to be different. Some motivations for development include:

- real-estate investment
- bringing un-watered country into production to increase herd size
- improving control over the herd to increase production
- growing an aligned business
- tax management.

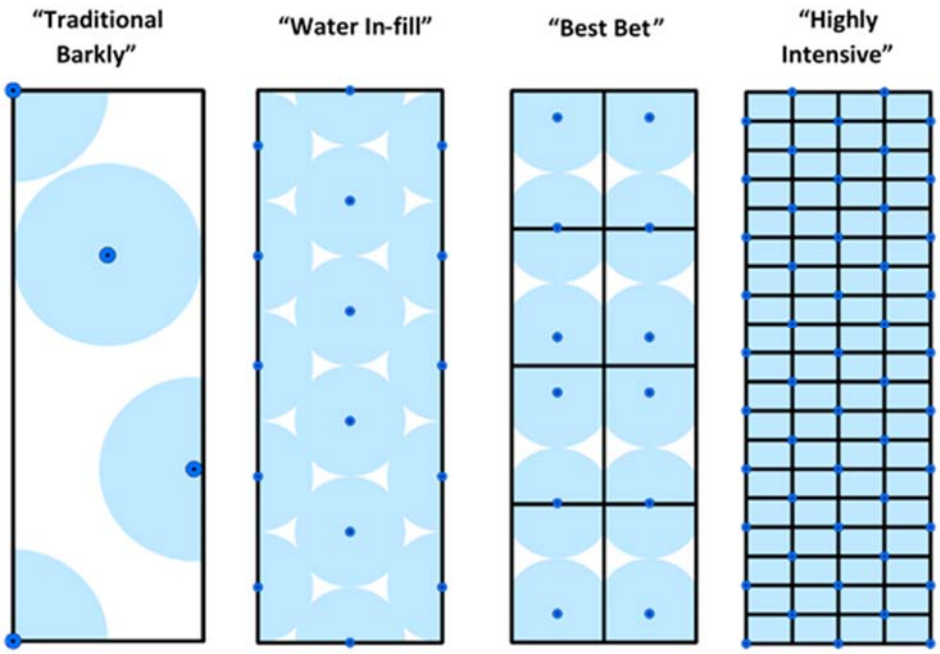

Figure 2 Four examples of development typically seen on the Barkly

A single development approach is unlikely to meet all of the needs above. The diagrams in Figure 2 represent four common approaches to development typically seen on the Barkly. Diagrams are based on a 300km² paddock. The black lines are fences, the dark dots are water points and the shading is the watered area. Pros and cons of these approaches are summarised on the following page.

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Table 1 Pros and cons of common development strategies.

STRATEGY	PROS	CONS
'Traditional Barkly' Large paddocks with few waters that are 10km or more apart (5km watered area grazing radius)	• Lowest capital cost • Lowest repairs and maintenance • Drought buffer available • Likely to be a mix of land types so that cattle can escape black soils during wet • There are ungrazed areas for grazing-sensitive flora and fauna	• Under-utilised country • Often have large numbers of cattle on few waters • High mustering costs • Whole paddock has to be locked up for spelling • High risk of degradation around waters • Limited opportunity for herd segregation etc.
'Water In-fill' Large paddocks with waters ~6km apart to achieve a 3km watered area radius over as much land as possible	• Land area is almost fully utilised • Low fencing costs • High water security • Likely to be a mix of land types so that cattle can escape black soils during wet	• High mustering costs • High capital and repairs and maintenance costs for waters • Whole paddock has to be locked up for spelling • No drought buffer • No ungrazed areas for grazing-sensitive flora and fauna • Limited opportunity for herd segregation etc.
'Best Bet' Smaller paddocks (15-40km^2) with waters ~6km apart	• Land almost fully utilised • Potential for herd segregation and rotation/spelling • Possibly lower mustering costs depending on grazing system used • Moderate water security • Optimal balance between watered area and capital costs	• Higher fencing capital and repairs and maintenance costs than above • No drought buffer • Risk of cattle being confined on black soils in wet season • No ungrazed areas for grazing-sensitive flora and fauna
'Highly Intensive' Very small paddocks with waters ~4km or less apart	• Land is fully utilised • High potential for herd segregation and rotation/spelling • Possibly lower mustering costs (depending on management system)	• Highest capital cost • Highest repairs and maintenance costs • Risk of cattle being confined on black soils in wet season • No drought buffer if all paddocks are continuously grazed • Production unlikely to be higher than 'Best Bet' • No ungrazed areas for grazing-sensitive flora and fauna • Economic analyses show that capital investment may not be recouped under low levels of herd productivity or on poorer country types

Key considerations

- Understand seasonal feed risk in your district – how will your infrastructure help/hinder management of failed wet seasons?
- There is a biological limit to how much grass a paddock can grow with rain alone.
- Once this grass is within three kilometres of water, it is all accessible to cattle, and maximum carrying capacity is reached.
- Beyond that, no further fences and waters can further increase carrying capacity.
- Additional fences and waters can allow you to manage the cattle and feed supply more precisely (but there is no guarantee that it will increase production once you have reached sustainable carrying capacity).
- The more intensive you go, the more sophisticated your management needs to be.
- Avoid confining cattle on heavy black soils in the wet season.
- Do your sums carefully – some country types are easy to over-capitalise.

DPIR staff can help you to work out your current and potential carrying capacity and provide evidence-based feedback on your infrastructure plans. We can also provide customised information on seasonal feed risk for your location.

Who's new in the Zoo? – Daniel Pritchard

Daniel arrived in Tennant Creek seven months ago working in Aboriginal health, with a health background and long working history in agriculture. Joining DPIR in Tennant Creek is a perfect opportunity to further his dreams in the Northern Territory and cattle industry.

From mustering cattle, shoeing horses and working in human dentistry, Daniel is very diverse in his working background and understanding of different working environments and cultures making him a great fit into DPIR.

Daniel looks forward to meeting people from around the Barkly and learning as much as he can.

Daniel will be completing a twelve-month contract in Regional management with DPIR filling in for Skye Spence.

Contact information:

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Administrative Officer
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Email daniel.pritchard@nt.gov.au

Figure 3 DPIR in Tennant Creek's newest recruit, Daniel Pritchard

Newcastle Waters feathertop burning experiment

Gabrielle Penna, DPIR Tennant Creek

Figure 4. The burning experiment at Newcastle Waters is focused on pasture management of Feathertop Wiregrass (middle).

The department is involved in a feathertop burning trial in collaboration with Barkly Landcare, Territory Natural Resource Management and Newcastle Waters. The question: Will burning feathertop wiregrass decrease its dominance in Mitchell grass pastures in the Barkly region of the Northern Territory?

Feathertop wiregrass (*Aristida latifolia)* is a native perennial grass which becomes dominant throughout black soil pastures and can supress growth of the more preferable 3P (productive, perennial, palatable) grasses in the paddock. Feathertop is an important indicator of declining pasture condition (usually resulting from overgrazing). Once it's established, it is difficult to control through grazing management alone because of its high seed production and ability to compete with other grasses. This is the reason fire is being considered as a management method.

Studies in Queensland have shown feathertop can be controlled in Mitchell grass pasture by burning in July. Compared to our 3P species like Mitchell grass and curly blue grass, feathertop is a shallow rooted grass which is prone to drought and is a lot less likely to recover from fire. Success however is dependent on a few factors. Firstly, soil moisture; soil moisture needs to be low both before and up to eight weeks after burning to ensure feathertop doesn't have the opportunity to recovery and re-establish itself. The second is having a hot clean fire; this is dependent on having sufficient fuel loads and environmental factors during burning.

Literature says that fire could be the answer but with pasture being such an important resource to us, we need to know if it's worth the risk or not.

The experiment, at Consolidated Pastoral Company's Newcastle Waters Station (NCW), was set up to test the most effective time to burn before the end of the dry season. A site was selected on an open Mitchell grass plain with moderate levels of feathertop together with the desirable 3P grasses, mainly weeping Mitchell and curly blue grass.

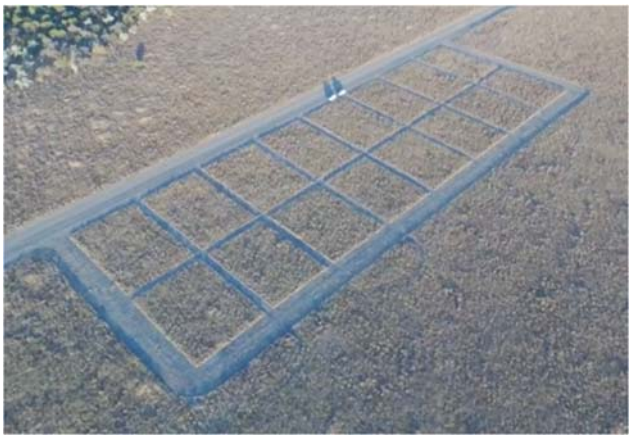

Figure 5. The experimental site located on a black soil Mitchell grass plain. Each plot is approximately 30 x 50m.

The site was fenced off at the beginning of the trial to retain sufficient fuel loads and allow for spelling after the burns. The plots are made up of an unburnt control, July burn, September burn, and November burn, and replicated four times.

Before each burn a range of indicators are recorded so treatments can be compared from the start of the trial, before they burn and then again at the end of the wet season as soon as the site is accessible. All of this data will also feed into the DPIR's carrying capacity and feed budgeting databases.

Pasture is important to us as feed, so the later we burn the better. As we get later into the season however, we lose fuel loads and run the risk of rain ruining the eight week dry spell we need. Hence burning needs to be timed for when it will be most effective. Once we have recorded all of our pasture and soil data, staff at NCW burn the site while we record environmental and fire behaviour so we can gauge the intensity of the burn. This includes flame height, flame angles, wind speed, temperature, humidity and the time it takes for the plot to burn. We also note if the fire is patchy or if it went through cleanly. The studies in Queensland found that burning there in July can reduce feathertop by 70 per cent.

Figure 6. Jak Andrews (Manager at NCW), sets light to a July plot.

Although the project is only half way through, here are some of our interim results:

- Average dry matter yield estimates:
  - July 1,842 kg/ha
  - September 1,515 kg/ha
- Pasture moisture content:
  - July 16%
  - September 11%
- Soil moisture:
  - July
    - 0.72% on the surface
    - 2.4% at depth (20cm)
  - September
    - 0.25% on the surface
    - 1.92% at depth (20cm)
- Fire intensity
  - July 4511 kW/m
  - September 5990 kW/m

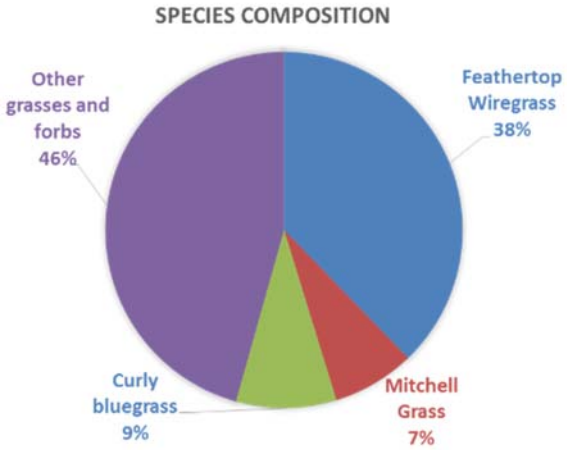

Figure 7. Average species compositions of the experimental site.

For more information contact Gabrielle Penna at gabrielle.penna@nt.gov.au

Stay tuned for the full trial results mid-2018.

Managing seasonal variability when there are no more spare paddocks

Robyn Cowley and Dionne Walsh, Rangeland Scientists, Darwin

As the Barkly develops with more fences and waters, the unwatered and unused areas are slowly but surely disappearing. This is good for maximising your forage and gives you more options for managing your herd, but there are some negatives to consider. For one, those unused areas were refuges for species that can't persist with grazing – estimated to be about 10 per cent of all the plants and critters.

There is also another loss, the loss of the drought buffer, the 'spare paddock' beyond the watered area that helped cattle get through leaner years. Generally speaking, the past two decades have been one of the wettest spells recorded in the region but the rainfall and pasture growth graph below indicates there's no guarantees that it will stay that way.

There tends to be multi-decadal cycles in wetter and drier periods – but don't take our word for it – just look at the rainfall and pasture growth over the last century for a central Barkly location below. You can almost see the waves of moisture rolling in and out across the Barkly.

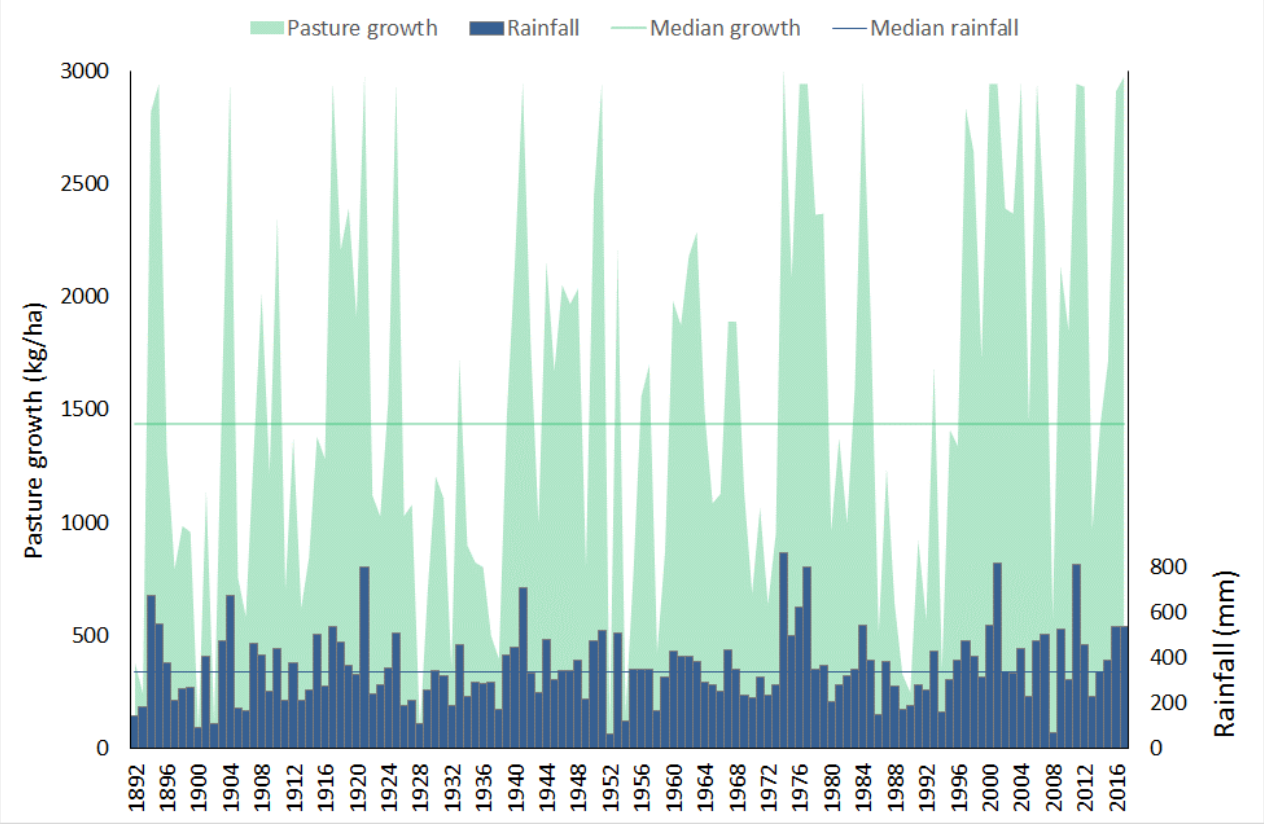

Figure 8 Rainfall and modelled pasture growth from a central Barky location.

Over the last two decades pasture growth was below the median in only two years (2008 and 2013). However if you were on the Barkly in the 20 years before that, from 1977 to 1996 it was a much drier proposition, with 13 years out of 20 having below median pasture growth. Lean years. Hard years. But with much of the country unwatered back then, there was an inbuilt drought buffer where stock could walk out beyond three kilometers and find feed. But with more waters going in, paddock sizes shrinking and herd sizes growing, this 'buffer' risks being eaten each and every year.

The median pasture growth at this location is 1438 kg/ha, which (aiming to use 20 per cent of growth) equates to a long-term safe stocking rate of 10 AE/km^2. In the drier period between 1977 and 1996, the safe stocking rate was nine AE/km^2, but between 1986 and 1992, the average was less than half that at four AE/km^2. This compares to the most recent two decades where the higher pasture growth could have safely stocked on average 15 AE/km^2. Yet right in the middle of that period there was a failed wet season in 2008 with less than 600 kg/ha growth. That was not an aberration, but has occurred in 15 per cent of years. Although stocking rates of 12 - 14 AE / km^2 are safe in wetter years, if stocking rates were kept at this level year-in, year-out, safe levels of use would be exceeded most of the time.

Table 2 Variation in pasture growth and safe stocking rate for a central Barkly location over the last 126 years.

Percentile year	**0**	**10**	**20**	**30**	**40**	**median**	**60**	**70**	**80**	**90**	**100**
Rainfall	62	172	226	267	300	339	375	411	475	538	867
Pasture growth (kg/ha)	68	460	775	977	1135	1438	1726	2067	2369	2944	3007
Safe stocking rate (AE / km^2)	0.5	3	5	7	8	10	12	14	16	20	20.5

Because you don't know when the next failed wet is coming, the best way to manage seasonal risk is to (1) moderately adjust stocking rates seasonally with the aim to average the long-term safe carrying capacity and (2) don't exceed safe stocking rates more than one year in three. Degradation events tend to occur when one or more dry years follow a run of good seasons, when stock numbers have increased but are not reduced quickly enough in response to the sudden turnaround in seasons.

Having pre-planned strategies that have inbuilt thresholds and triggers for intervention to quickly respond to changing forage availability will minimise the chance of degradation events. Having stocking rates low enough to permit pasture recovery in better seasons is also an important component of keeping your pastures in good condition, so they can make the most of the rain that falls and grow to their potential.

It's going to get drier. History repeats through cycles of drier and wetter seasons. We've just had two decades of amazing rainfall and growth. What is your contingency plan for when seasons are drier again? Do you have spare ungrazed areas? Do you have animals built into the system that can be easily offloaded? When will you move or sell stock? Do you have decision points during the wet season that trigger action? Is your planned level of development economically sustainable if we now have two decades of drier seasons?

DEPARTMENT OF **PRIMARY INDUSTRY AND RESOURCES**

TENNANT CREEK CHRISTMAS CLOSURE

DPIR Barkly House office will be closed from midday Friday 22 December 2017 to Monday 1 January 2018 inclusive.

Normal office hours will resume on Tuesday 2 January 2018.

For emergencies during the closed period:

Animal Biosecurity/Stock Movements/Emergencies: 0401 113 445

We wish you all a very happy Christmas, and a safe and prosperous New Year.

NORTHERN TERRITORY GOVERNMENT

New research on the benefits of phosphorus supplementation from NT DPIR trial

Tim Schatz, Principal Pastoral Production Officer DPIR

As we come to the time of year when cattle producers are thinking about wet season supplementation, it is timely to share the latest results from the NT DPIR phosphorus (P) supplementation trial at Kidman Springs (Victoria River Research Station). The trial is finding large benefits from P supplementation of breeding cattle on P deficient soils.

While the benefits of P supplementation are well known to some producers, it seems that many are not convinced enough to actually spend money on it, as sales figures show that adoption of P supplementation has been much lower than would be expected for the amount of P deficient country in northern Australia. Many previous trials have shown increased weight gain from feeding P supplements to growing animals during the wet season, but there haven't been any published studies showing significant increases in pregnancy rates from feeding mineral (dry lick) P supplements to breeding cattle in northern Australia. As a result extension officers and supplement manufacturers have had to give estimates of the benefit that producers might expect without hard data to back them up. This may contribute to the low adoption of P supplementation. Hopefully the results from the Kidman Springs trial should help to change that.

The results emerging from the research at Kidman Springs are providing compelling information for producers with P deficient country. In the trial there are two treatment groups (P+ or P-) that have been managed in exactly the same way since weaning except that their mineral loose lick supplement either contains P (P+) or does not (P-). The composition of the lick fed to each treatment is shown in Table 1. The lick is fed year round in troughs under supplement sheds. The cattle graze in two adjoining paddocks of native pasture that are acutely P deficient (Colwell P <4 mg/kg). The treatments swap paddocks each year to minimise paddock effects. The research is finding large benefits from P supplementation (see Table 2). A summary of these benefits is:

- P+ maiden heifers were 66 kg heavier at the end of their first mating as two year olds
- Pregnancy rates were 10 per cent higher in P+ maiden heifers
- Re-conception rates were 25 per cent higher in P+ first lactation heifers
- The average weight of P+ first lactation heifers was 120 kg higher when their calves were weaned
- The average weaning weight of calves was 34 kg heavier in the P+ treatment
- The mortality rate over the three years from weaning to 3.5 years old was 7 per cent lower in the P+ treatment
- Preliminary economic evaluation shows that by spending an extra $41 per head on supplement over the first three years the P+ treatment has produced about $300 per head more so far. If the heavier weight of the females retained is also included then it works out to be around $513 more per head

While this trial is showing large benefits from P supplementation, the response will vary depending on the level of P deficiency in the soils on which cattle graze. Benefits of this scale may not be seen where P deficiency is not as severe. Producers can get soil tests done if they are not sure of the P status of different land types on their property. Soils with a Colwell P level of less than 4 mg/kg are considered to be acutely deficient, while 5 mg/kg is deficient and 6-8 mg/kg is marginal. Also if your first lactation heifers look more like the ones in Figure 9 than Figure 10 then it is likely that they will benefit from P supplementation.

Figure 9 First lactation heifers in the P- treatment.

It can be difficult to put supplements out during the wet season, but many producers have found innovative ways to do it and usually 'where there is a will there is a way'. Some have supplement dumps in shipping containers or under tarps scattered around their properties. It is really up to individual producers to weigh up the costs and benefits in their particular situation. The Kidman Springs P research trial is providing them with new information to do this.

Figure 10 First lactation heifers in the P+ treatment

Table 3 The contents of the loose mix supplement fed in the trial.

	Wet season		**Dry season**	
	P+	P-	P+	P-
Ridley Biofos MCP	42%		25%	
Salt	50%	73.5%	40%	65%
Ammonium sulphate (Gran Am)	7.5%	7.5%	10%	10%
Urea			25%	25%
Limestone		17.5%		

The trial is on-going and will compare the kilograms of calves weaned from each treatment over several years.

Table 4 Results from the Kidman Springs P supplementation trial.

	P-	P+	Difference
Weaning weight (kg) (at start of trial)	175	175	0
Maiden heifer pre-mating weight (kg)	238	270	32
Maiden heifer post mating weight (kg)	327	392	65
Pre-calving weight (kg)	324	393	69
Weight when calves weaned (kg)	262	382	120
Maiden pregnancy percentage (%)	60	70	10
Calf loss rate (%)	22	21	-1
1st lactation heifer pregnancy rate (%)	5	30	25
Mortality rate to 3.5 y.o (%)	8	1	-7
Weaning weight of calves (kg)	139	173	34

For more information contact:

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Developing Tennant Creek and the Barkly

Stuart Smith, DPIR Alice Springs

While most of the Barkly Pastoral people were at Brunette Downs for the Landcare Field Day, there were miners, business people and agriculturalists who stayed behind in Tennant Creek for the Barkly Regional Resources and Economic Development Conference at the Civic Centre on the 24 and 25 October.

Mike Fawcett, from the Legacy Mines Unit of DPIR gave an overview of the $1.8 million dollars spent to address safety, sacred site and environmental issues surrounding public access to historic mine sites in the region. Stuart Ord from the Department of Tourism and Culture is working on opportunities for some of these sites to be linked into tourist trails.

Dr Ian Scrimgeour, Executive Director of the Northern Territory Geological Survey (NTGS) also spoke at the conference, telling delegates about the work NTGS continues to do under CORE (Creating Opportunities for Resource Exploration) initiative to help attract exploration investment to the Territory. This includes work with Geoscience Australia to identify mineral deposits in the area between Tennant Creek and Mount Isa, of which there appears to be many hidden beneath the surface.

Stuart Smith, from the Alice Springs Office of DPIR, in conjunction with Jason Hill, Director Land Assessment Branch of Department of Environment and Natural Resources presented on the recent soil surveys around Tennant Creek and the historic cropping trials and current plant based industries in the region such as melons, hay and onions.

The conference was also an opportunity to showcase Tennant Creek's ongoing development as the NT's resources services hub, which has been given a recent boost with the opening of the Edna Beryl Gold Mine and construction beginning on Jemena's Northern Gas Pipeline. The pipe stockpile in Tennant Creek for this pipeline is the largest in Australia, and they are managing to lay five km of pipe a day. Other projects like phosphate mining on Murray Downs were also discussed.

Tom Ryan from Northern Territory Cattleman's Association gave a great overview of the local cattle industry. He said that Australia is the largest beef exporter in the world, but is a relatively small producer. Its markets, in order of size, are Japan, Korea, USA and Indonesia. Pork and poultry are the biggest protein sources in South East Asia, but beef is getting bigger and presents a great opportunity.

Australia is also a high cost producer, costing $350-$360 per beast to process, while it is only $180 per beast in the United States of America, with other countries like Brazil and India processing even cheaper than this, but the market loves the Australian 'story' and its history of product integrity.

He also evaluated the impact of the Livingstone Abattoir near Darwin on the NT industry, saying it has allowed herd improvement by creating a market to cull aged animals.

Figure 11 Barkly Regional Resources and Economic Development Conference

For the Barkly, he said the region has more 'flatback' (non – Brahman) cattle than it did in the past, and now has the largest Wagyu herd in Australia. He emphasised water as a key to growth – the more it is reticulated, the more pasture can be utilised. An estimate was given that cattle are only grazing 50% of pastures at present.

Other opportunities mentioned were hay and fodder production, including the use of legumes to increase the amount of protein in the diet of local animals.

The conference was supported with speeches from politicians Steve Edgington (Mayor, Barkly Regional Council), Minister Ken Vowles and Minister Gerry McCarthy, who all gave their vision for the region.

Overall the conference gave an excellent overview of the developing resource and agricultural industries in the region, which can only be good for overall economic development in the Barkly.

Vocational education and training (VET) Teacher/Trainer of the Year Award

Alison Haines, Agriculture & Rural Operations, School of Primary Industries, Charles Darwin University

Congratulations to Fiona Plunkett, Katherine-based horse-cattle production trainer, who won the Vocational education and training (VET) Teacher/Trainer of the Year Award at the Northern Territory Training Awards 2017.

Fiona was in the running for national recognition at the Australian Training Awards, in Canberra, which were won by Western Australian, Jane Goodfellow.

Fiona Plunkett is the Workplace Traineeship Program Coordinator with the Katherine Rural Campus based Agriculture and Rural Operations Team for the Charles Darwin University's (CDU) School of Primary Industries.

With a background in agriculture in south-east Queensland, Fiona completed a Bachelor of Education and taught high school students before heading to the Northern Territory to work in extensive beef cattle production. Joining the CDU team in early 2015, Fiona now coordinates the traineeship program for approximately 200 students. Fiona mentors three staff who supervise students as well as spending extended time on the road conducting workplace training and assessment visits on site.

Fiona, a member of the Northern Territory Cattleman's Association '2017 Future NTCA Program' and contributor to several local sporting events and committees, is a passionate advocate for the importance and potential of quality VET training in the agricultural industries.

Figure 12 Fiona Plunkett at the 2017 NT Training Awards.

NORTHERN TERRITORY GOVERNMENT

DEPARTMENT OF PRIMARY INDUSTRY AND RESOURCES

BARKLY RANGELAND MANAGEMENT COURSE

An interactive course developed for station staff to enhance their skills & knowledge in the area of land & production system management in the Barkly region.

What: 1 day course covering…Pasture species, dynamics & management | Weed management & poisonous plants | Animal nutrition | Biodiversity

Where: On-station

When: Early 2018

For more information about BRMC or to organise a course on your station, please contact:

Jane Douglas
Pastoral Production Officer
DPIR, Tennant Creek

Tel: (08) 8962 4483
Fax: (08) 8962 4480
Email: Jane.douglas@nt.gov.au

Helen, Thomas, Greg, Jane, Gabby, Casey, Daniel & Angela would like to wish you all a very Merry Christmas and wet New Year

Livestock disease investigations

The Department of Primary Industry and Resources (DPIR) provides a free disease investigation service to livestock owners for diagnosis of notifiable emergency, exotic and endemic disease, including zoonotic diseases. Berrimah Veterinary Laboratories provide free diagnostic testing for exclusion of notifiable disease for all disease investigations, and subsidies are available to private veterinarians for significant disease investigations in livestock. The Northern Australia Enhanced Disease Surveillance program has been introduced from 2017-2019 on a trial basis providing increased subsidies for cattle and buffalo disease events reported to and investigated by private veterinarians. This program recognises the higher costs and challenges associated with conducting disease investigations in more remote regions.

During July to September 2017, 70 livestock disease investigations were conducted to rule out emergency diseases or investigate suspect notifiable diseases across the Northern Territory (NT). Figure 13 shows the number of investigations by species of livestock.

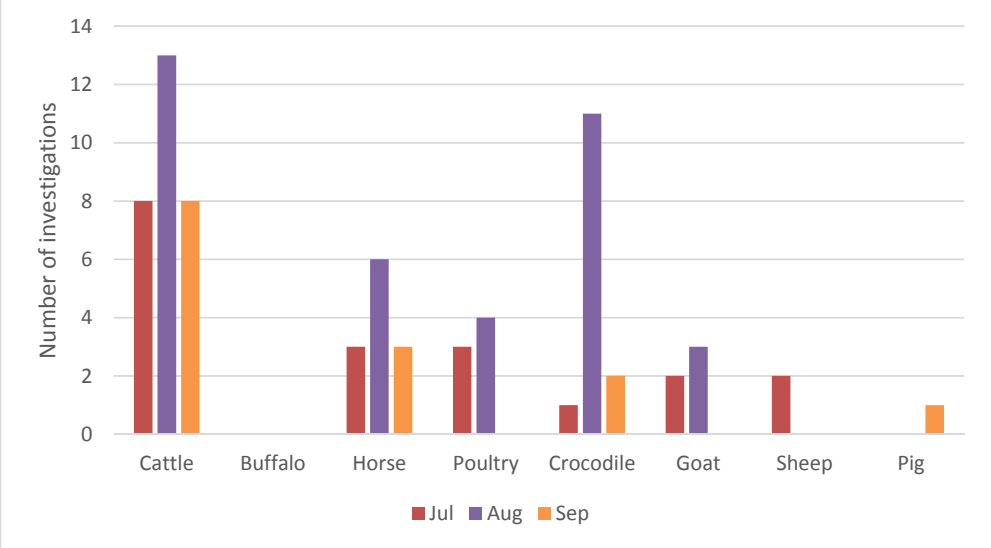

Figure 13. Livestock disease investigations by species for July to September 2017

Berrimah Veterinary Laboratories processed 177 livestock sample submissions, including samples to substantiate proof of disease freedom certifications, for accreditation programs and targeted surveillance to support market access. The following case reports are a selection of disease incident field investigations during the quarter.

Foot and Mouth Disease excluded in salivating cattle in Alice Springs

The manager of a property in the Alice Springs region reported four 2-3 year-old crossbred Hereford steers with signs of weight loss, salivation and loss of muscle/movement control. The steers had been recently yarded and were due to be transported for slaughter. Examination of stock by DPIR veterinarian found affected steers to have the symptoms reported, as well as being in respiratory distress. The most severely affected steer was euthanased for post mortem examination.

Figure 14 The affected steer was salivating and in respiratory distress.

Post mortem examination revealed water in the lung tissue and evidence of a healing tongue lesion. While it was suspected that the steer was persistently infected with bovine viral diarrhoea virus, samples were referred to the Australian Animal Health Laboratories (AAHL) to exclude exotic diseases including Foot and mouth disease (FMD) and Vesicular stomatitis (VS) for the tongue lesion, and Haemorrhagic septicaemia and Contagious bovine pleuropneumonia for the lung lesion. Tests excluded all exotic diseases.

Bacteriology culture found moderate growth of a *Pasteurella multocida* from the lung lesion. The diagnosis of the lung lesion was severe pneumonia.

Pasteurella multocida also plays a leading role in the development of bovine respiratory disease (BRD), a condition also known as 'shipping fever'. The condition commonly arises where the causative organism becomes established by secondary infection, following a primary bacterial or viral infection. This usually occurs after stress. In the case of BRD, pasteurellosis is usually preceded by viral infection with either infectious bovine rhinotracheitis (IBR caused by bovine herpes virus type 1), bovine viral diarrhoea virus (BVDV), para-influenza type 3 (PI3) or bovine respiratory syncytial virus (BRSV). The viral inflammation of the respiratory passage initially causes lung lesions and suppresses immunity allowing the bacteria to proliferate. BRD is a major production issue for beef feedlots and dairy.

While the IBR serological blood test results were negative, a positive BVD antigen ELISA blood test and a negative BVDV AGID antibody blood test confirmed the steer was persistently infected (PI) with BVDV. The *P. multocida* bacterial infection combined with the viral BVDV infection led to the BRD syndrome, intensified by the stress of mustering and yarding.

BVDV Type 1 is endemic in the Northern Territory cattle population, with most herds and up to 70% of cattle exposed. In-utero infection can result in PI animals which show signs of poor development, ill-thrift and early death. These PI cattle are immune-suppressed and may also develop the more acute and often fatal mucosal disease which presents as severe gastro-intestinal ulceration.

Vaccines are commercially available for the main respiratory viruses and bacteria that contribute to BRD, including IBR and BVDV. The vaccines are not widely used in Territory, but should be administered prior to entry into the feedlot and mixing of cattle.

A recommendation was made to cull the remaining three clinically affected steers. There have been no further clinical problems reported from this herd of cattle.

Figure 15 Affected steer in poor condition.

Figure 16 Affected steer in poor condition

Pneumonia due to pasturellosis causes mortality in Brahman cows in Katherine

In August, a private veterinarian investigated mortality in a group of 180 Brahman cows which had recently been transported to a property in the Katherine region. Over a two-week period approximately 50 cows had shown signs of nasal discharge and coughing, and 30 had died.

On clinical examination the affected cattle were having trouble breathing, with heavy breathing rates and nasal discharge. A single three year-old cow was euthanised and post-mortem examination revealed liquid in the lungs, as well as the lung sticking to the thoracic wall. Examination of lung tissue under the microscope revealed a severe pneumonia, consistent with *Mannheimia haemolytica* infection. There was no microscopic evidence of viral involvement, and a heavy growth of *M. haemolytica* was cultured from lung samples. A diagnosis of pneumonic pasturellosis (shipping fever) was made. While shipping fever usually involves infection caused by *P. multocida* in cattle, it may also be caused by *M. haemolytica* in the absence of *P. multocida*. It is likely that the recent stress of mustering, long-distance transport and yarding resulted in the high morbidity and mortality in this case. This level of pneumonia is an infrequent situation in northern beef herds.

Vaccines are commercially available for the main respiratory viruses and bacteria that contribute to BRD, including IBR, BVDV and *M. haemolytica*. The vaccines are not widely used in Territory, but should be administered prior to entry into the feedlot and mixing of cattle – a process known as 'backgrounding'.

Slaughtering, processing and sale of meat in the Northern Territory

The slaughtering, processing and sale of meat for human consumption is regulated under the Northern Territory *Meat Industries Act 2011 and* associated Regulations.

The slaughtering of animals for human consumption has been a common practice on stations over many years, providing meat for owners, managers, employees and guests. It is not an offence to slaughter an animal on your property for consumption by your family and staff, provided it is consumed on the property on which it was slaughtered. The meat must not be sold, bartered, or given away.

The meat may be provided to paying guests in facilities where supplying meat is not the primary source of income e.g. Bed and Breakfast facilities. Any paying guests must be informed and non-paying guests should be advised that the meat has not undergone an Ante Mortem or Post Mortem inspection by a qualified meat inspector.

The sale of station slaughtered meat in a roadhouse or community store situation is considered to be an offence, and is not permitted. All meat used in these operations must be sourced from a licenced processor. The use of station meat houses to process meat for sale is not permitted unless licenced by Department of Primary Industry and Resources.

It has been common practice over many years for stations to supply meat to Aboriginal communities located on cattle stations and this practice is legal and may continue provided the meat does not leave the property of slaughter, is not on-sold, or given to others. This means that where an animal is slaughtered on a station for a local community, the carcass cannot be dressed by community members and removed from the property. If the animal was removed from the property live and transported to the community for slaughter, Northern Territory Waybill and National Livestock Identification System regulations would apply.

The supply of meat donated by a company or station to a community event such as a rodeo or campdraft is acceptable, provided that the meat is consumed on the station on which it is slaughtered and not on-sold at the event. If there is an abattoir located near the station it may be beneficial to slaughter the animal through the abattoir as the standard of meat preparation meets the Australian hygienic meat standards. The station or event co-ordinator should be able to negotiate a service kill in this situation.

All meat sold to the general public for human consumption must be processed in a registered establishment that has been issued with a stamp that has an Establishment Number. Meat must be inspected by a qualified meat inspector with a minimum Certificate III in Meat Safety.

Further information and advice concerning slaughtering and processing may be obtained from the DPIR:

David Frost
Senior Meat Industry Officer
Telephone: 89992255
Mobile 0401113090

New Livestock Biosecurity Network staff member for Northern Australia

Jess Rummery has joined the Livestock Biosecurity Network (LBN) as Manager – Biosecurity and Extension for Northern Australia. She joins LBN fresh from a role within the Australian Department of Agriculture and Water Resources, which predominantly focused on live exports. Jess brings a great deal of experience to LBN, adding her professional experience to her qualifications in animal science, public administration and national biosecurity policy.

The new LBN coordinated role aims to support producers across the Territory and the rest of northern Australia. One of Jess' first responsibilities was to deliver biosecurity planning workshops to producers in Alice Springs, Tennant Creek, Katherine and Darwin throughout September.

Jess is based in Darwin, and is available to speak to producers and provide information on Biosecurity Planning and the Livestock Producers Assurance (LPA) program.

Jess can be contacted on M: 0499 077 213, E: jrummery@lbn.org.au

Brands, National Livestock Identification System and waybills in the Northern Territory

Brands

Under the Northern Territory (NT) *Livestock Act 2011*, a NT registered brand is required on all cattle prior to being moved off their property of origin, unless they are under eight months of age. Brands can be used on horses, buffalo and camels, but it is not compulsory.

The NT *Livestock Act 2011* and associated Regulations uses a three-letter brand system, where one letter must be the letter 'T', and a distinctive (symbol) brand system. Branding is a clear way of identifying ownership of stock. In any proceedings, proof that an animal is branded in accordance with the provisions of the *Livestock Act* with a registered brand is prima facie proof that the animal is the property of the owner of the registered brand. It is important to note that National Livestock Identification System (NLIS) devices do not constitute proof of ownership.

Cross-branding

Cross-branding of cattle after purchase is not mandatory in the Northern Territory: however, if livestock are not cross branded, it provides no legal claim to purchased stock. Purchased cattle need to be cross-branded correctly to provide evidence of ownership. The Livestock Regulations clearly stat that:

1. the first brand applied to livestock must be in the position described on the Certificate of Registration for the brand
2. each subsequent brand applied to livestock may be in any other position, where there is sufficient space, specified in Schedule 2
3. a person commits an offence if the person applies a registered brand to livestock in a position other than is required or permitted by sub-regulation (1) or (2)

A brand should not be applied over an old brand. It is an offence to place a brand on the cheek.

Brands – Sale of a property

While the sale of a property may include the stock, the brand cannot be sold to the new owners. Options for brands after the sale of a property are as follows:

1. If an agreement is made in the sale contract to transfer the brand to the new owners, an application to Transfer Brand must be lodged with the Registrar.
2. If the registered owner of the brand no longer wishes to use the brand, it may be cancelled. An Application for Cancellation of Brand must be lodged with the Registrar.
3. If registered owner of the brand wishes to keep the brand, but move it to a new property, a Request to Change of Run must be lodged with the Registrar, together with original certificate/s for amending.

If not the registered owner of new property, Owners Permission to Use Run form is required and must be lodged with the Registrar.

4. If other brands are registered for use on property/parcel of land, then the new property/land owner/s will need to complete Owners Permission to Use Run form, and lodge with the Registrar.
5. If the new owner of the land does not want to have other brands registered for use on their property/parcel of land (e.g. continue agreements previous owner/s may have had) then the new Owner must complete Owners Permission to Use Run - REVOKED form and lodge with the Registrar.

BRANDS ARE NOT TRANSFERRED AUTOMATICALLY BY A PROPERTY SALE OR BY A WILL

A brand is registered to a person or company for use on a nominated NT property only. **Under no circumstances are these brands to be used in any other state or territory. This means the branding iron can only be used by the registered owner (or their representative) on the registered Northern Territory property as stated on Brand Certificate/s.** It does not restrict branded cattle being agisted on other properties. To brand on a NT property not registered with the Registrar is an offence under the *Livestock Act 2011* and associated Regulations, and incurs a penalty.

If you are wanting to transfer your brand to a new property, or use your brand on a property for a specified period of time, please contact your local Regional Livestock Biosecurity Officer.

Further NT brands information and forms are at:
https://www.nt.gov.au/industry/agriculture/livestock/brand-and-identify-livestock/livestock-brands-in-nt

National Livestock Identification System (NLIS)

National Livestock Identification System (NLIS) is Australia's system for identifying and tracing livestock for food safety, product integrity and market access purposes. NLIS was introduced by industry and enacted in State and Territory legislation. In the Northern Territory (NT), NLIS commenced on 1 July 2007, and has been operating now for over a decade.

In the NT, all cattle and buffalo must have an approved NLIS device attached to their off side (right ear) before they are moved off a property, regardless of the destination. All sheep and goats must have an approved transaction tag for any movement off a property.

The owner of the property must ensure all cattle or buffalo (including calves) moving off the property have an NLIS device attached to the right ear before the livestock movement begins. While calves and weaners under eight months of age do not require a brand for movement, they must have an NLIS device. Livestock that were born on the property of origin are to have a white 'breeder' NLIS device, cattle that were not born on the property (e.g. agistment cattle, purchased cattle, cattle in transit and strangers) and do not already

have a NLIS device, must have an orange 'post breeder' NLIS device attached prior to moving off the property.

Please note that calves born in transit are not an exception to the rule. If calves are born in transit yards, or arrive in transit yards without a NLIS device, the transit yard is required to apply an orange 'post breeder' device.

NLIS devices are specific to the property that they are ordered for. It is an offence to apply NLIS devices to livestock on a property that the NLIS devices are not registered to.

For further NT information on NLIS and forms see:
https://www.nt.gov.au/industry/agriculture/livestock/brand-and-identify-livestock/nlis-in-the-nt

Waybills

You must use a Northern Territory (NT) waybill to move all of the following kinds of livestock from one property to another within the NT:

- alpacas, camels and llamas
- cattle and buffalo
- deer
- goats
- pigs
- sheep.

You do not require a waybill for horses or poultry.

A waybill is a record of livestock details and movement. When you move livestock the waybill travels with the stock from the property of origin to the destination property. It is an offence to move cattle without a waybill in the NT.

Waybills are an important part of the National Livestock Identification System and provide detailed information which is used to trace animal movements. The system also acts as a deterrent to stock stealing, identifies the property of origin to abattoirs and export markets, and provides detailed documentation for station management.

It should be noted that any stranger cattle need to be provided with their own separate waybill if travelling in a consignment of cattle going to a property other than their most recent property of origin, e.g. transit yards, export yards, or abattoir. If stranger cattle are being returned to their property of origin, a waybill needs to accompany the cattle.
For more information about waybills, how to fill them in and what you must do with them, read the Agnote Waybills in the NT (500.9 kb).

Release of new Antimicrobial Resistance website for Antibiotic Awareness Week

Antibiotics are not commonly used in Northern Territory livestock, but globally this is an enormous one-health issue that is emerging. Our current lifestyle depends on the continued successful use of antibiotics and all users are urged to consider responsible antibiotic use to limit the development of antimicrobial resistance (AMR). The Australian Chief Medical and Veterinary Officers have issued a joint statement on AMR and developed a website (www.amr.gov.au) that contains general advice for all stakeholders.

Australian Government
Department of Health

Australian Government
Department of Agriculture and Water Resources

Statement from Australia's Chief Veterinary Officer and Chief Medical Officer on how Australians can reduce antibiotic resistance

World Antibiotic Awareness Week, 13 – 19 November 2017

To mark World Antibiotic Awareness Week for 2017, we are calling for all Australians, including all prescribers in human and animal health, to pause and consider antibiotic use.

Antibiotic resistance is happening now in Australia and around the world. We need to take urgent action to reduce antibiotic resistance in Australia.

The more we use antibiotics, the more chance bacteria have to become resistant to them.

We know that antibiotics are overused in human health in Australia. Australia is currently ranked one of the highest users of antibiotics compared to similar countries.

A growing number of infections – such as pneumonia, tuberculosis, and gonorrhoea – are becoming harder to treat as the antibiotics used to treat them become less effective.

The rise in resistant infections means that both human and animal health care professionals are left with limited, or in some instances, no available treatment options.

Even if new antibiotics are developed, without behaviour change, antibiotic resistance will remain a major threat.

Antibiotics are important medicines, however it is also important that everyone understands that they only work against bacteria. Antibiotics do not work against infections caused by a virus and will not make you feel better.

There are many things that you can do to take action. Visit the new www.amr.gov.au website to find out more information on what you can do to combat antibiotic resistance in Australia.

The website has information for various audiences including:

- General public
- Animal owners
- General practice
- Hospitals
- Aged care
- Veterinary practice
- Agriculture and industry

We encourage all Australian's to get involved in our efforts to reduce antibiotic resistance in Australia.

Dr Tony Hobbs, Acting Chief Medical Officer
Dr Mark Schipp, Chief Veterinary Officer

Barkly House staff

Barkly House
First Floor, 99 Paterson St
PO Box 159, Tennant Creek, NT, 0861
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Department of Primary Industry and Resources

Regional management

Executive Officer	Helen Kempe	08 8962 4484
Administration Officer	Daniel Pritchard	08 8962 4488

Animal Health

Principal Livestock Biosecurity Officer	Thomas Haines	08 8962 4458 M: 0401 113 445
Stock Inspector	Greg Maguire	08 8962 4492 M: 0457 517 347

Livestock Industry Development

Pastoral Production Officer	Casey Collier - mat leave	08 8962 4493
Pastoral Production Officer	Jane Douglas	08 8962 4483
Pastoral Production Officer	Gabrielle Penna	08 8962 4486

Barkly Landcare & Conservation Association

Landcare Facilitator	Angela Carpenter	08 8962 4494