

Pioneering the land at 'Bunuro' North West QLD

David and Donna Rankine take on a challenge at Torrens Creek.



'Bunuro' is a beef cattle business owned and managed by David and Donna Rankine and their four children. The underlying management strategy at 'Bunuro' is to use grazing management to utilise the natural resources to their full potential. David and Donna have completed a large amount of property development which has allowed them to reduce grazing pressure at water points and give paddocks long rest periods.

The couple purchased the property in 2001. Prior to this 90% of the country had never been grazed by livestock due to lack of water. Since managing 'Bunuro' the Rankines have drastically increased the production potential of the land while simultaneously increasing ecological health and resilience.

The key driver to accomplish this is the sense of achievement from sustainably pioneering the land. Looking ahead, David and Donna are excited to see the future potential at 'Bunuro'.



Case Study Snapshot



Location: South of Torrens Creek, 340 kilometres West of Townsville, North Queensland.

Property size: 31,000 hectares

Currently runs: 1400 LSU

Average annual rainfall: 500mm

Enterprises: Beef cattle breeding.

'Bunuro' is a family operated beef cattle business in North West Queensland that is applying property development and rotational grazing to maximise their resources.

Achievements:

- ✓ Increased carrying capacity
- ✓ Utilising a challenging land type
- ✓ Improving ground cover
- ✓ Increased health and resilience of ecosystem
- ✓ Provided education for four children at boarding school

Drivers of success:

- ✓ Education
- ✓ Desire to build and achieve
- ✓ Passion for the industry

Ideas for future innovations:

- ✓ Rumen lignin digestion bug
- ✓ Satellite imagery for measuring groundcover and feed budgeting
- ✓ Access to education that creates resilient businesses

What makes this business sustainable?

David and Donna have done a large amount of property development to convert 'Bunuro' into a viable cattle business that is ecologically sustainable. The business is sustainable because the land is not showing any symptoms of ecological decline from grazing in comparison to when it was pristine. When David and Donna purchased 'Bunuro' they immediately began to implement management techniques that would ensure long term sustainability. A number of these management practices are highly innovative for the area, such as rotational grazing, single wire electric fencing and a reticulated water system.

The location of 'Bunuro' provides a number of challenges for beef production. These challenges include: soil acutely deficient in Phosphorus; over half of the property contains heartleaf a native shrub that is poisonous to cattle; and the property is exposed to the climate extremes of western Queensland – including frosts, droughts and extreme heat. The Rankines describe 'Bunuro' as a maintenance or 'survival' block rather than a property that aims for large livestock weight gains.

What makes this business sustainable?

- ✓ They are successfully grazing country that is nutrient deficient and traditionally difficult to utilise
- ✓ Groundcover has not declined with the introduction of grazing
- ✓ They lose minimal stock from heartleaf poison
- ✓ Livestock are adapted to the conditions
- ✓ Business model is sustainable

“Grazing management is the most important factor in our business.”

Managing using a rotational grazing system has allowed the Rankines to operate a sustainable business.



Heart-leaf is a native plant highly poisonous to cattle

David and Donna observed the small areas that had been traditionally grazed when they purchased the property were in a state of ecological decline, and set about introducing rotational grazing by completing a large amount of development. The Rankines state that “grazing management is the most important factor in our business.” Without rotational grazing they would not be able to properly utilise over half of the property which contains heart-leaf.

During the wet season cattle are moved between paddocks approximately every three to seven days and during the dry

season they are moved every two to three weeks. Paddocks typically receive two light grazes during the wet season and a third graze during the dry season. In total, 'Bunuro' paddocks receive approximately 320

days rest annually. This extensive rest period is what allows the Rankines to maintain high levels of groundcover and improve ecosystem health on the fragile land type.

Strategically grazing the land with heart-leaf has allowed the Rankines to markedly increase the carrying capacity of 'Bunuro'. Previously the heart-leaf country could only be grazed during the dry season, as it is most toxic after rain, however the Rankines are experimenting with grazing in the wet season, and are finding very few cattle are poisoned from heart-leaf. David states "the key to utilising heart-leaf country in the wet season is making sure there is enough good feed in front of the cattle. This is achieved by making sure pastures have had a long rest period and ensuring stocking rate doesn't exceed carrying capacity. The increased number of animals we are able to run is what makes 'Bunuro' pay."

Heart-leaf can be at peak toxicity a few weeks after winter rain is received. David states "We have discovered that we have six weeks up our sleeve after a winter rainfall event until we may lose cattle from heartleaf. Before we reach this six weeks mark, cattle are locked out of the heartleaf country and put into the clean country until the peak toxicity subsides."

For the cattle business to be sustainable at 'Bunuro' David and Donna put their focus on developing the most strategic and resilient breeding herd for the property. The sole enterprise at 'Bunuro' is a Brahman cross Angus breeding herd, as the adaptability of Brahmans in combination with the marketability and fertility of the Angus breed is optimally suited for this scenario.

The herd is seasonally mated to ensure cows are receiving the highest quality of feed while they have the greatest nutritional requirements. Mortalities are significantly reduced as cows are not rearing a calf during the dry season when nutrition is limited. For this to occur, cows are exposed to the bull for 100 days

"It is critical that one person is able to move the cattle easily, efficiently with minimal stress."

from 22nd November to 28th February, resulting in all cows calving before Christmas. The seasonal mating strategy allows the Rankines to select strongly on fertility, as the animals that are not pregnant in the correct window are easily identified and can be removed from the herd to prevent dry season mortalities. They retain all female progeny in the breeding herd and steers are normally transported to suitable agistment country for backgrounding. Calves are weaned using nose boards with the aim of minimising the stress of weaning by keeping the calves with their mothers. This also allows for efficiency and ease of management as all cattle are run together in one mob.

Given the soil on 'Bunuro' is quite deficient, nutritional management is critical to ensure cattle survive. During the dry season the Rankines feed their cattle with a high urea content (50%) supplement to make up for the severe protein deficiency in North Queensland pastures. Running the cattle in one group also saves significant expenses in the business by distributing supplements and checking water on one area of the property.

In the business model at 'Bunuro' it was necessary to have a low-input system. David states "In this system we choose to shift cattle regularly. To make it pay it is critical that one person is able to move the whole mob in a few hours easily, efficiently and with minimal stress." Economically, the musters need to occur without the use of helicopters or additional staff. One strategy in use is turning off water points at the rear of the paddock which has proven to be a success as mustering is now an efficient and rewarding experience for people and cattle.

The majority of the pasture on 'Bunuro' is Spinifex. There are small amounts of native Blue-grasses, Kangaroo grass, and Black Speargrass. There are also some introduced legumes such as Wyn cassia and Seca stylo. David and Donna are aware of the importance of looking after these native species to promote biodiversity in their pastures. "The native grasses are what cattle will selectively graze, so even grazing pressure and resting this land type is critical to promote the growth and colonisation of these species." David explains.

The current stock watering system is fully reticulated, pumping from one bore and distributed to over 90 kilometres via 63mm poly pipe. They have installed approximately 60 troughs and there are 5 dams on the property. Water storage has been challenging, as turkey's nests on this land type do not effectively hold water. Instead, they use multiple poly-lined tanks which have a total capacity of 387,000 litres. Reliable stock watering systems are an important tool toward sustainability in this business.

The property is subdivided predominantly with single wire electric fencing, with the exception of holding paddocks and laneways which are mostly two strands. They have found this system of fencing cost-effective to install and manage. The Rankines have overcome some challenges which originate from not having access to a power source that provides substantial voltage through the fence. With due diligence, the single wire fencing has proven to be effective and is significantly cheaper than using traditional fencing for paddock subdivision.

Prior to the Rankines management, the majority of the country on 'Bunuro' was untouched by livestock. The family are managing the land effectively and having a positive influence on the environment, despite the challenges associated with beef production on this land type. The ecosystem is active and flourishing, there is little runoff, minimal erosion and groundcover, and land condition is improving despite numerous below average rainfall years.



The Rankines are maintaining high levels of groundcover despite numerous poor seasons.

The business is managed as a low-input system to ensure long term viability. David and Donna believe a sustainable business is something that has stable ecological health and is economically viable. They take great pride in pioneering this area and the couple are excited to see what is ahead at 'Bunuro'.



Motivations for change

When the Rankines purchased 'Bunuro' they borrowed the majority of the money, which they acknowledge was high risk. The couple then decided to focus on the ecosystem health of the property to improve carrying capacity and get a return on their investment.

The driving force to adopt a sustainable grazing business came from the Rankines determination to pioneer the land without damaging it. Profitability was also a fundamental motivation, as the business needed to provide a stable economic return.

David and Donna could see that traditional set stocking management was damaging the fragile country. The 6-700 LSUs that were maintained on 'Bunuro' prior to the development was largely unsustainable and causing land degradation around water points.

“We were aware of the limitations of the country but we were ready to try something new.”

Before the couple owned 'Bunuro' they met Terry McCosker, director of RCS, at a grazing information session in Pentland. He was promoting cell grazing in North Queensland, which was a new concept for the area. This knowledge sparked an interest with the Rankines who began implementing regenerative grazing practices after the purchase of 'Bunuro' a few years later. The couple started slowly, with grazing rotations utilising existing fences and water. They gradually gained experience with rotational grazing, which allowed time to expose the cattle to a new system and manage the herd psychology. David states “In the early days we found it can be easy to misjudge feed. This was a steep but necessary learning curve for us, and now rotational grazing gives us a great deal of control over our pasture budgeting and monitoring.” Starting cautiously was beneficial, as it allowed them to make mistakes on a small scale.

At first David and Donna were unsure how they would utilise the heart-leaf country, as they didn't know anyone who had relied on it for useful grazing country. In 2002 David and Donna received funding for a pipeline and to save costs, they ran the pipeline down a fence along the road between the clean and heart-leaf country. Initially this was only to save money on clearing a new line, but it turned out to be a strategic decision. The first few years of managing 'Bunuro' coincided with very poor seasons and there was little grass available in the clean paddocks, so to avoid totally de-stocking the property David and Donna needed to utilise the heartleaf country. They installed additional water points off the pipeline which ran along the fence. This meant that grazing pressure was well distributed and regular rotations in the heart-leaf country resulted in plenty of available feed and minimal losses to poison.

David states “We were aware of the limitations of the country but we were ready to try something new. We were determined to own our own land and pioneer these new practices in the area. We wanted to manage it in a way that was improving rather than declining ecosystem health.”

The Rankines state that when making changes or trying something new it is important to have access to knowledge and education. David and Donna completed GrazingforProfit in 2002, not long after taking over ownership of 'Bunuro'. They enrolled in RCS' GraduateLink program in 2003 and then went on to complete three years of ExecutiveLink. This is where the business began to gain momentum. In 2005 they negotiated a deal where they were able to purchase a large number of quality cattle at an affordable price. The Rankines simultaneously completed a significant amount of development and this synchronicity provided the business with leverage as they sustainably and economically increased their herd numbers. Since

graduating from ExecutiveLink, David and Donna have also completed a Low Stress Stockhandling School (LSS) and they are currently involved in the Climate Champion program.

Although this management style was completely new territory for the area, they felt there were minimal risks with adopting these practices. The couple were also surrounded by a network of peers from other parts of Queensland which gave them support and confidence to adopt innovations.

While the Rankines had a picture of what they wanted the business to look like, there have been a number of hurdles to overcome. Namely, heartleaf and highly deficient country is the biggest ongoing challenge for the business. They were aware they were investing money in country that was traditionally deemed useless. Also, the skill level to successfully implement rotational grazing took some time to establish, and the current market situation provides financial challenges which are consistently driving the couple to make strategic, economic decisions. David and Donna believe they have overcome challenges through a combination of persistence and trial and error.

The most exciting activity happening in the business at the moment is the near-completion of property development. David observes "We have experienced a run of poor seasons, but we still have a great groundcover and cattle are performing well. This shows us the system is sustainable." The biggest achievement for the Rankines is they can see they have developed something from nothing, and it is maintaining ecosystem health. The two fundamental tools that have allowed them to do this are grazing management and property development.

Measured success at 'Bunuro'

Since 2001 the Rankines have made some key observations that show they are improving the land at 'Bunuro'. This includes:

- ✓ Increase in ground cover
- ✓ Greater pasture growth and resilience
- ✓ Increase in carrying capacity
- ✓ Increase in desirable species
- ✓ Greater biodiversity

David and Donna believe that measuring changes in the pastures and ecosystem is critically important to a grazing business. They can see they have improved their land from visual assessment, fixed point photo monitoring, and the increase in LSUs sustainably run on the same land area. The Rankine's Grazing Charts also show significant improvements in measured carrying capacity. Donna has created her own Grazing Chart spreadsheet and diligently monitors feed available and feed consumed in each paddock. This is the fundamental tool that allows them to ensure that stocking rate does not exceed carrying capacity.

Completing property development was significantly easier to achieve with funding from NRM groups and government bodies. Almost 50% of the water and fencing development costs were covered by contributions from Landcare, Desert Channels Queensland and Desert Uplands. Figure 1 and 2 below show the quantity of property development that has occurred on 'Bunuro'. The circles around the blue dots are the radius that cattle will walk. In this map each circle represents 2 kilometres. Anything outside these circles is unlikely to be grazed. Figure 2 shows the completed stage of property development which utilises the nearly the entire grazing area of the property.

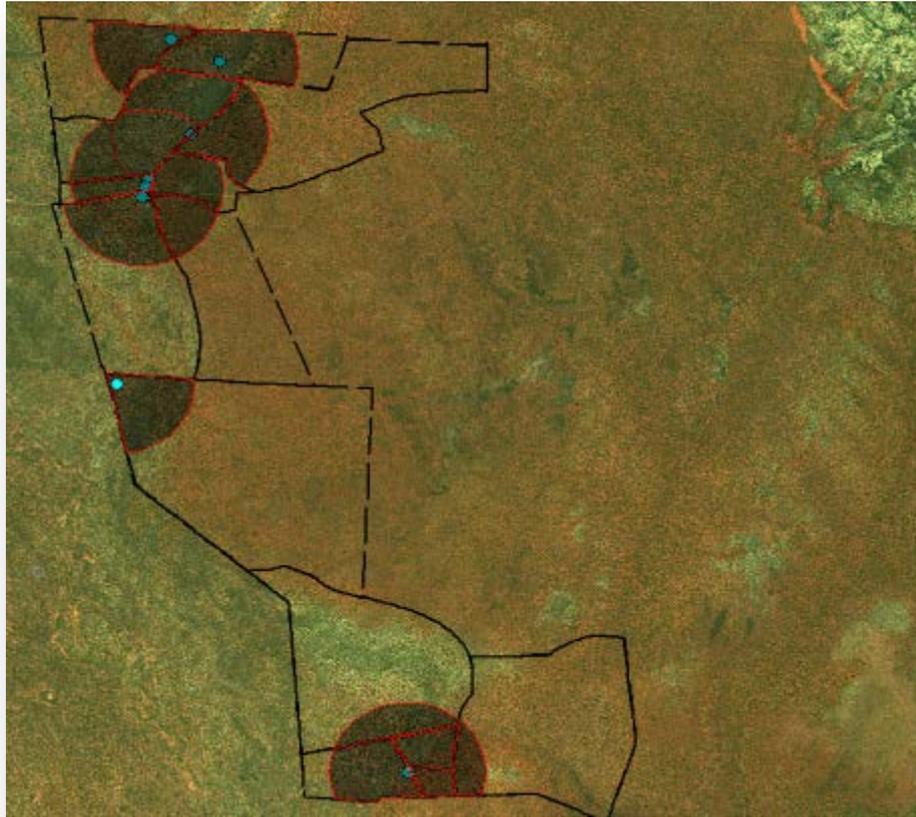


Figure 1 'Bunuro' in 2001 prior to fencing and water development

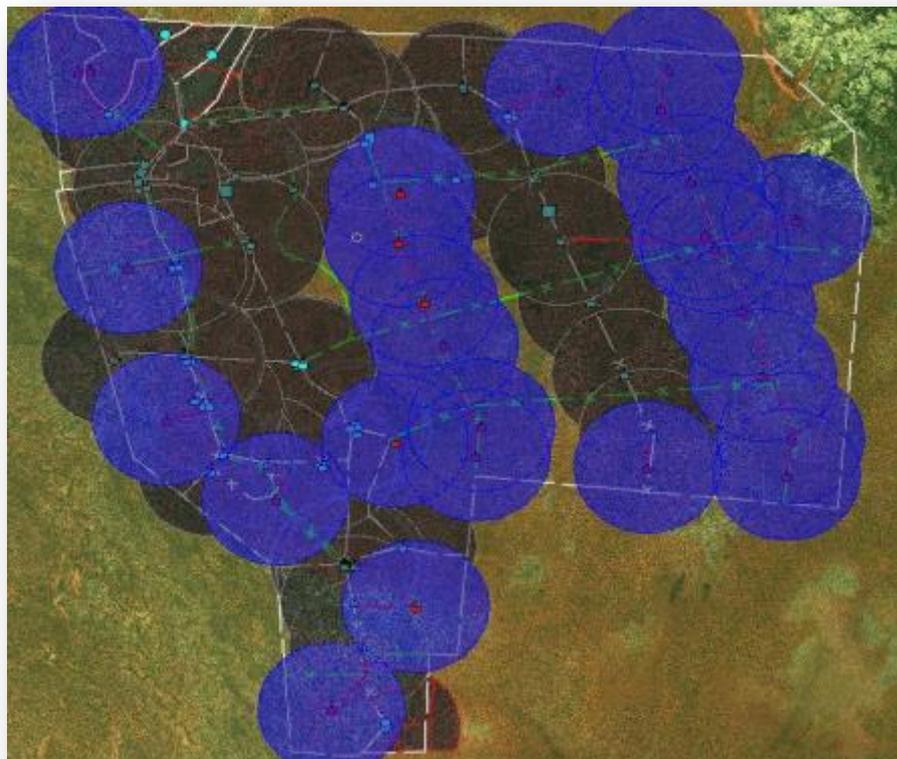


Figure 2 'Bunuro' in 2014 after fencing and water development



Figure 3 below shows carrying capacity over the last 12 years. It can be seen that in general there has been a progressive increase in Stock Days per Hectare (SDH). An obvious decline can be noticed from 2011 onwards as the family de-stocked, matching cattle numbers to the land's carrying capacity in highly variable seasons.

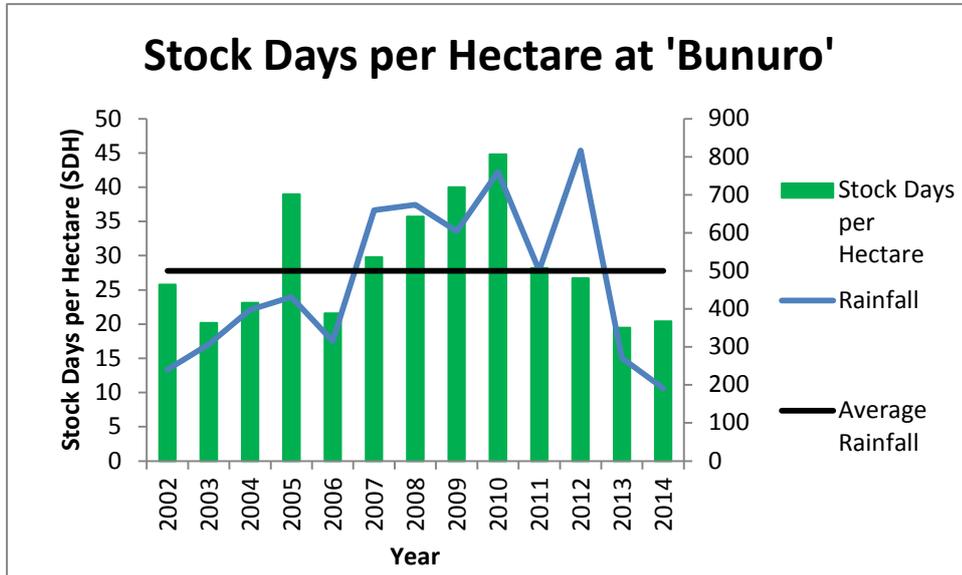


Figure 3 Carrying capacity measured in Stock Days per Hectare (SDH)

Figure 4 shows groundcover trends since 1990 at 'Bunuro'. The Rankines began managing the property in early 2000s and prior to this the majority of the land was untouched. It can be seen that after 2000 there have been times when groundcover reduces. The overall trend from 2005 onwards is inclining significantly. In particular, the increase in the lowest 10th percentile line indicates that areas with the lowest groundcover are improving. The convergence of the three lines highlights that grazing pressure across the property is becoming more uniform. An increase in the median line and increase in the 10th and 90th percentile lines indicates that groundcover on the property is consistently increasing since the mid-2000's. It can also be seen that prior to cattle grazing, there were natural increases and decreases in groundcover occurring. This is would be due to factors such as low rainfall years and fire events. Overall this figure shows that this system of grazing management has not been detrimental to ecosystem health beyond natural processes.

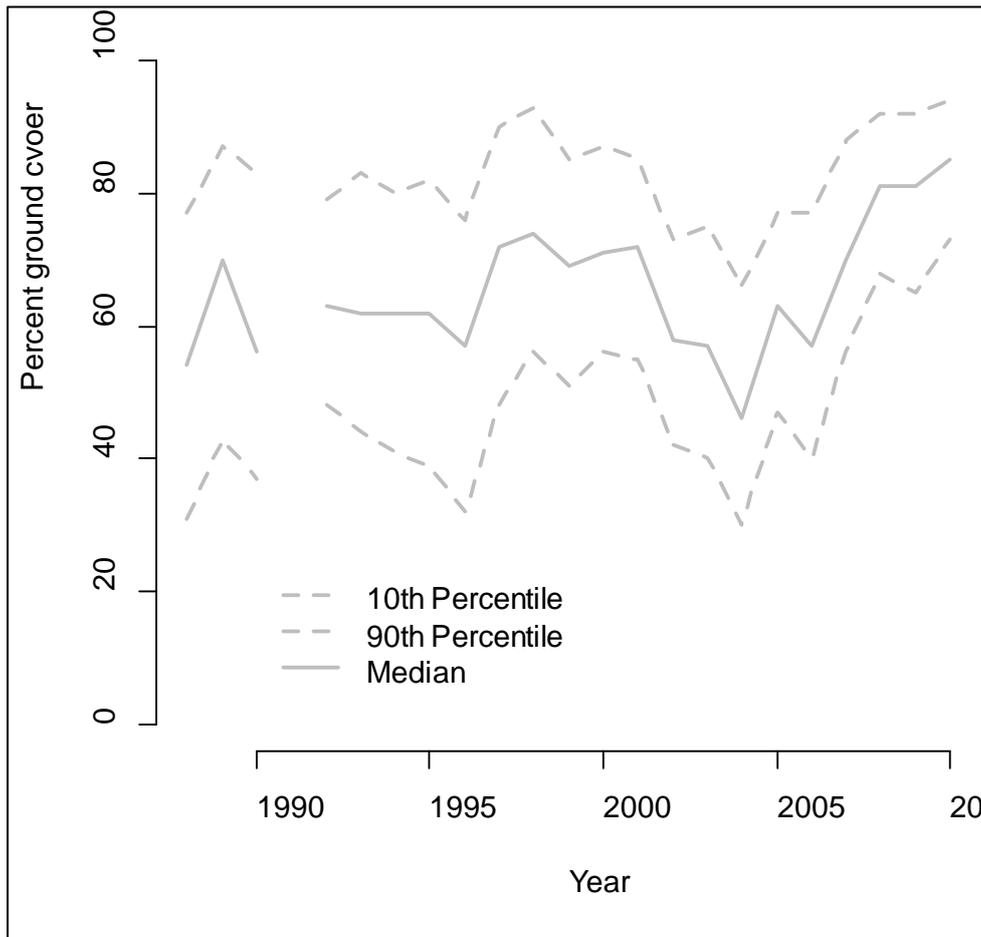
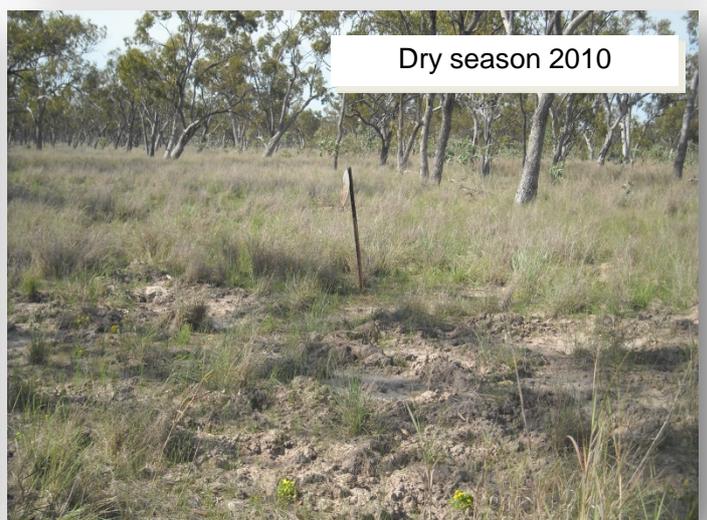
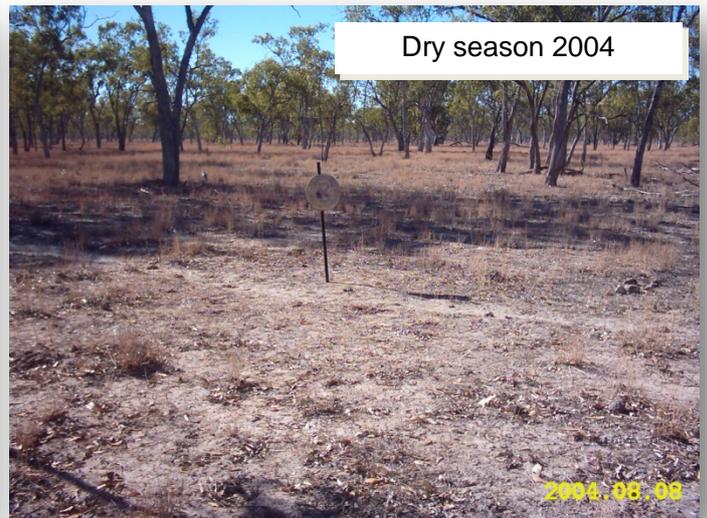
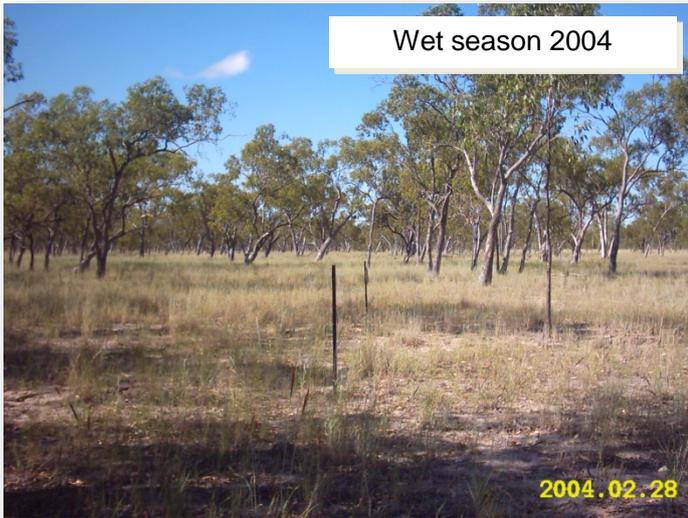


Figure 4 Groundcover trends at 'Bunuro'

Source: Daniel Gregg CQ University

The photo monitoring series below also represents changes in groundcover. A key observation is the improvement in groundcover during the dry seasons, which increases rainfall infiltration, resulting in greater pasture growth, increased carrying capacity and improved animal production.



Innovations

The innovations introduced at 'Bunuro' are a fundamental factor to why the business is sustainable and the Rankines are at industry-leading standard with grazing management. Each has been adopted to increase business productivity, improve ecosystem health and reduce overhead costs.

Of the innovations rotational grazing has had the largest impact at 'Bunuro' which is validated against the rigorous feed budgeting and record keeping by the Rankines. Alongside this, single wire electric fencing was an innovation that meant the rotations could be set up easily and quickly.

The level of water development seen in Figure 2 is innovative to the area and the use of telemetry at these water points has also saved significant time and money in the business. David and Donna reside primarily in Prairie, so monitoring water remotely saves time and money. Another cost-saving innovation at 'Bunuro' is using tractor tyres on concrete slabs for troughs. So far they are proving to be cost effective and durable. This saving made a significant difference considering the large quantity of water development that has occurred on the property.

A key innovation at 'Bunuro' is mustering the whole mob of cattle without the use of a helicopter which has saved significant cost. Despite heavily timbered country, mustering is often done by one person on a motorbike. To assist this, the Rankines have set up multiple troughs in each paddock. The main trough is normally in a cell centre at the front of the paddock, and prior to mustering, a trough at the back of the paddock is turned off. Cattle are then required to drink at the front of the paddock which allows Donna or David to muster a significantly smaller area. To manage the muster more easily, a second trough at is installed at the front of the paddocks, approximately 50 metres away from the main trough in the cell centre. This second trough is gravity fed from the main trough, and the cell centre is closed off when cattle are moved out of the paddock. Any cattle left behind when mustering will be required to drink from this water and can be easily moved to the paddock with the rest of the cattle. This results in an easy, efficient and highly cost effective clean muster.

David and Donna are reducing the use of fire where possible. They've found that burning Spinifex country exposes a lot of bare ground, and animal impact followed by paddock rest is successfully promoting nutrient cycling, which is achieving a similar outcome to fire. They have also observed wattle is encouraged



Telemetry is a technology that saves the Rankines time and money.

by fire, and without fire the wattle naturally peaks and then diminishes after approximately five years. Overall the Rankines feel that minimising the use of fire will assist in improving soil and pasture quality.



Using tractor tyres for troughs has saved significant costs in water development

Looking ahead...

David and Donna feel the changing climate and market conditions are intriguing, and they are interested to see where it leads the beef industry. They are excited by the potential for new markets and the increasing trend for grassfed beef.

The Rankines are curious to see the long term effects of their property development and grazing management. They do not have specific production targets as they are unsure what the country is capable of running under this system. However, they aim to run as many cattle as possible while improving the quality of the country and utilising the heartleaf country to its maximum capacity. David states "We are interested to see how far it can go."

"We are interested to see how far it can go."

There is a small amount of development to yet complete, though the couple plan on continuing the current grazing management system and measuring increases in production with Stock Days per Hectare, the number of Large Stock Units (LSU) sustainably managed and overall grass quality.

Water medication is a tool the couple are aiming to use on 'Bunuro'. They hope to reduce the expense of supplementary feeding by purchasing a Nutridose water medicator, and are in the process of implementing this system, which will be used predominantly for distributing Phosphorus during the wet season.



The next generation of Rankines at 'Bunuro'

David and Donna are passionate about research and willing to support studies that helps move the industry forward. The property has potential to run up to two mobs of 1500 LSU. They could host research at 'Bunuro' and potentially run two separate rotations in very comparable areas – both with and without heart-leaf.

The Rankines feel that a genetically modified rumen lignin digestion bug could make a big difference in increasing production in North Queensland. Satellite imagery to measure groundcover and feed budgeting could also be a useful decision making tool in the business.

For David and Donna, completing property development assisted them to create a sustainable system. "We wouldn't be here if we weren't able to do the property development. Any scheme that assists graziers to utilise their land better is beneficial to the industry."

Overall, for the industry to be sustainable, graziers would need stable markets and a more substantial price for beef. To be sustainable graziers must also be improving their environment. David and Donna have said the best way for this to occur is for graziers to have good access

to education. Farmbiz funding was very helpful for the couple and any more funding such as this would be beneficial to encourage learning and education that facilitates a stronger business model for greater drought resilience.

The Rankines believe a sustainable industry must have very little topsoil runoff. David states "Regardless of the reef, losing any topsoil is a loss to your property. As graziers we should be doing everything in our control to minimise nutrient runoff. This is beneficial to both us as graziers and the Great Barrier Reef. Keep the topsoil where it should be – in the paddock."

When asked if they have any advice for other producers wanting to adopt a sustainable business, David states "Keep an open mind, and don't discount ideas just because they're outside the box - consider all possibilities. Also, when making changes start out small so you make mistakes and learn on a small scale. Be ready for

"Losing any topsoil is a loss to your property. Keep your topsoil where it should be – in the paddock."



learning curves and don't stop getting education."

Being open minded and having the drive to achieve and pioneer has enabled David and Donna to build a sustainable system at 'Bunuro'. The Rankines have taken on a challenge and made inspiring long term improvements to the property and the ecosystem in one of the more challenging areas to produce beef.