

STOCKING RATE AND PASTURE SPELLING DEMONSTRATION SITE



EAST RANKEN Paddock ALEXANDRIA STATION

This demonstration is a partnership between the North Australian Pastoral Company, NT Department of Resources, Meat & Livestock Australia and the Australian Government's Climate Change Research Program.

**For more information about the demonstration trial, please contact:
Casey Collier, Department of Resources, Tennant Creek, casey.collier@nt.gov.au or
Dionne Walsh, Department of Resources, Berrimah Farm, dionne.walsh@nt.gov.au**

Demonstration Site Paddock Visit – August 2011

This paddock visit, being held in conjunction with the 2011 Barkly Herd Management Forum, aims to:

- Increase local awareness of the demonstration trial.
- Present the Year 1 results.
- Discuss the practicalities of implementing wet season spelling and stocking rate management.



Purpose of the Demonstration Site:

- To demonstrate the benefits of wet season spelling and sustainable stocking rates for maintaining good land condition at new bores.
- To demonstrate the benefits of wet season spelling and sustainable stocking rates for improving land condition at old bores.

Background:

This demonstration is part of the Northern Grazing Systems (NGS) project. The aim of the NGS project is to develop practical, region-specific management options for managing the following four key issues that are impacting on the profitability and sustainability of the northern beef industry:

1. The challenge of matching animal demand and pasture supply from year to year.
2. Managing country in poor land condition.
3. Productive pastures too far from water for cattle to use.
4. Woody vegetation thickening (in some land types and regions).

Scientific research, producer experience and modelling have identified that the four most promising options for managing the above issues are:

1. Stocking rate management.
2. Wet season spelling.
3. Infrastructure development.
4. Prescribed burning (where relevant).

The NGS project aims to demonstrate examples of how the above practices can:

- Improve animal productivity and economic performance.
- Maintain and/or improve land condition.
- Improve risk management in relation to climate variability.

Ross Peatling has offered us the opportunity to monitor and document the pasture spelling and stocking rate management in East Ranken paddock on Alexandria. The demonstration site fits well with the priorities identified in the NGS workshops held in the region and by the modelling done to date. It is also an opportunity to build on grazing trials done in the region (e.g. Rockhampton Downs and Newcastle Waters) by monitoring land condition over the longer-term.

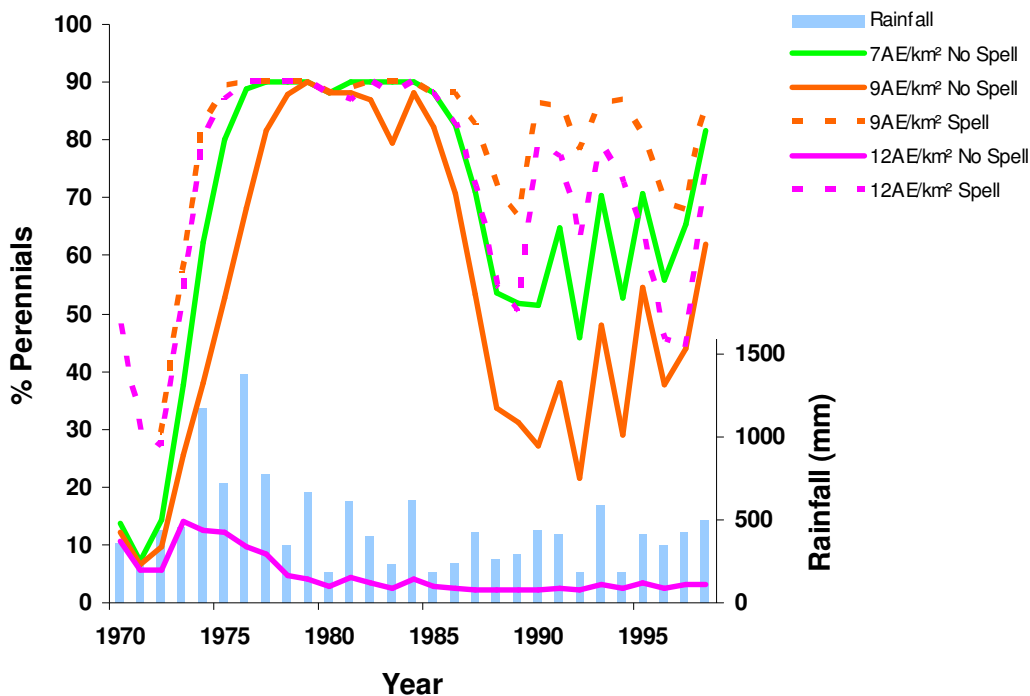


What evidence is there that stocking rate management and pasture spelling are good for business?

Last year, the NGS project reviewed the research literature for northern Australia and did some biological and economic modelling to test various management scenarios related to stocking rate management and pasture spelling.

The following graph and table shows some modelling that looked at the impact of stocking rate and spelling combinations on land condition for Mitchell grass pastures on the Barkly. The scenario was developed for the purposes of demonstrating improvements in C (poor) condition land, but also serves to highlight the benefits of spelling for maintaining pastures in good condition. At moderate to high stocking rates (>9AE/km²), good land condition could only be maintained long-term if spelling was included. For this simulation, a six-month wet season spell, once every four years, kept land in good condition. Without spelling, a significant decline in land condition occurred during poor seasons, even at moderate stocking rates.

Example GRASP component analysis of wet season spelling and stocking rate management for a grey cracking clay on the central Barkly. Percentage of perennials in the pasture is used as a proxy for land condition, with a level of 50% indicative of the boundary between C and B condition.



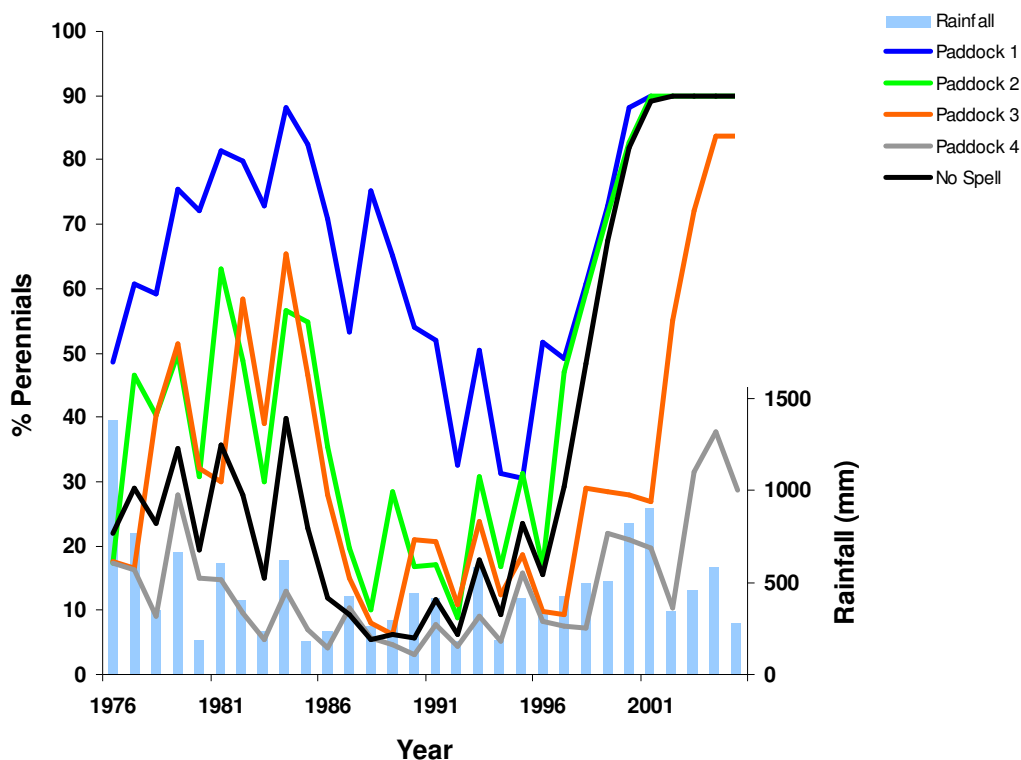
Model simulation results of average live-weight gain per hectare for the above stocking rate and spelling scenarios (1970-1998) for a grey cracking clay on the central Barkly.

Stocking rate and spelling scenarios	Average live-weight gain (kg/ha)
7AE/km ² (no spelling)	5
9AE/km ² (no spelling)	3
9AE/km ² + 6 month wet season spell every four years	7
12AE/ km ² (no spelling)	-8
12AE/km ² + 6 month wet season spell every four years	5

Management Considerations

Two common problems are seen in the implementation of pasture spelling. One problem occurs when the animals removed from the paddock/bores to be spelled are put into other paddocks or onto other bores without regard to the increase in stocking rate (see graph below). Overgrazing some paddocks/bores in order to achieve spelling for another defeats the purpose of the exercise. To overcome this problem, spelling should be done during good seasons (where there is more pasture available), animals should only be put into areas with spare grazing capacity, or excess animals should be sold or agisted. Some paddocks may have capacity for additional livestock during the wet season due to the extra watered area provided by semi-permanent surface waters. Such paddocks can provide a temporary home for stock from paddocks/bores that are being spelled.

Example GRASP component analysis of a six month spell every four years achieved via a four paddock rotation system, where the cattle from the paddock being spelled are spread evenly amongst the other three paddocks. A non-spelled paddock is included for comparison. The land condition performance of individual paddocks varies depending on where in the order they were spelled, and the seasonal conditions they experienced. For example, Paddocks 3 and 4 perform worse than the non-spelled paddock because they received additional cattle from the other spelled paddocks early in the rotation. As a consequence, Paddock 4 was not able to achieve any significant recovery in land condition.



The other problem commonly seen is that some producers consider that destocking paddocks during failed wet seasons or droughts is the same as spelling. Destocking during periods of little to no pasture growth might protect the remnant pastures and soils in the paddock but does not allow pasture plants to increase their root reserves or produce seed. Spelling thus needs to occur during periods of active pasture growth.

What is Being Measured at the Demo Site?

Monitoring is being done at three bores of different ages (>100 years, 6 years and a new bore). The following information is being collected:

(a) Paddock history

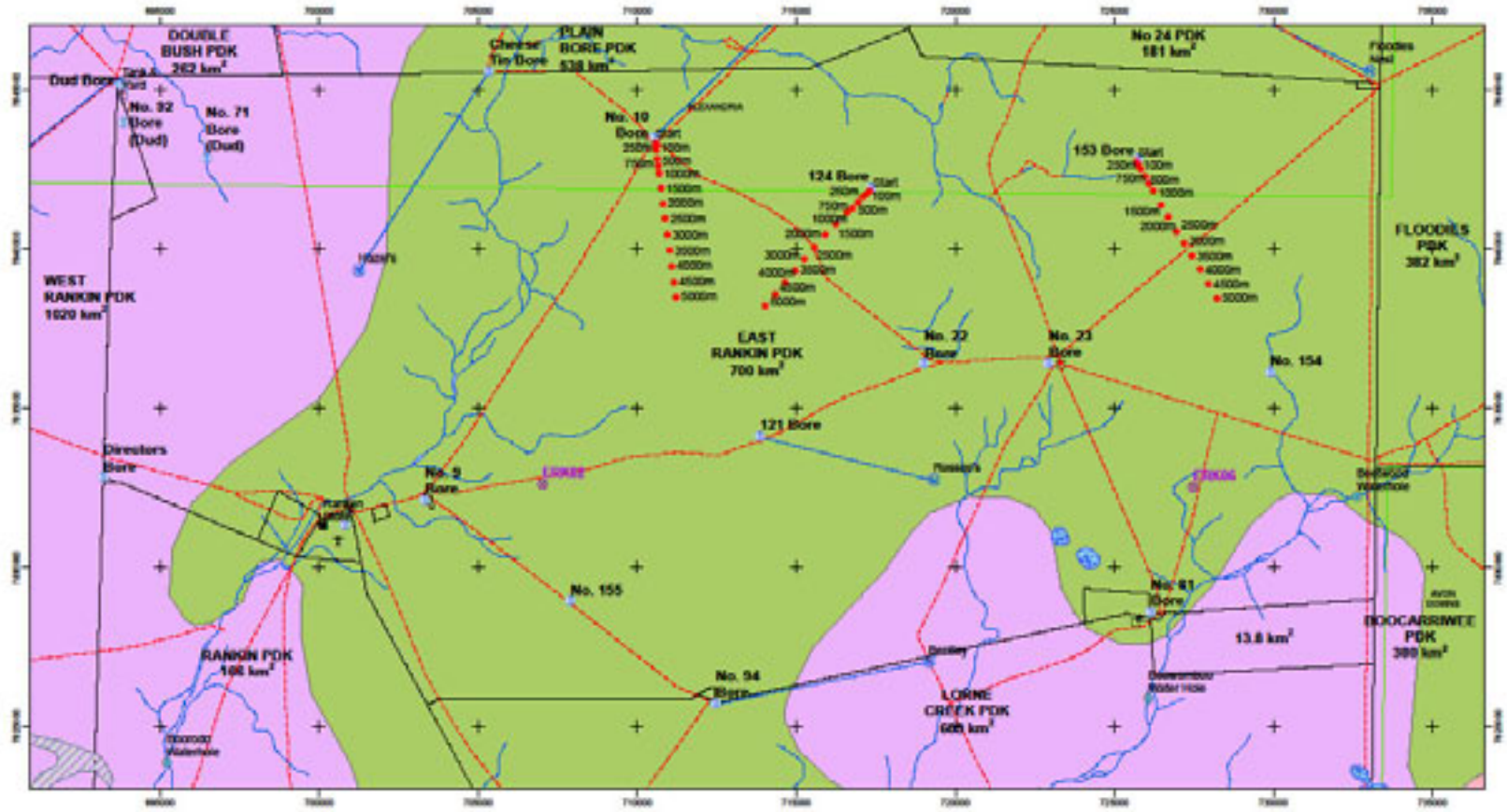
- Information relating to the history of paddock use: establishment date of bores, indicative stocking rates over time, costs of bore installation and repairs and maintenance, and stock management in relation to the spelling regime. This information will help to describe the history of the site and also assess the costs, benefits and economic performance of the spelling and stocking rate regime.

(b) Management information

- Dates that bores are in use/not in use, stock movements (stock numbers & class of stock into and out of the paddock and which bores are involved). This information allows the calculation of stocking rates and utilisation rates, which are known to have a strong bearing on the success of pasture spelling.

(c) Pasture data

- A 5km transect has been established at each of the three bores being monitored (see map). Each bore is a different age; No. 10 bore was drilled in 1910, and apart from a wet season spell in 2008 and 2009, has been grazed continuously. No. 124 bore was drilled in 2004 and has not yet had a wet season spell, while bore No. 153 is a new bore that was only put to use in 2010.
- All three bores will be monitored on a yearly basis with changes in land condition documented via observed changes in ground cover, pasture yield and species composition. An economic assessment of the spelling and stocking rate regime is also being completed by obtaining cattle data to calculate effective stocking rates and pasture utilisation rates.



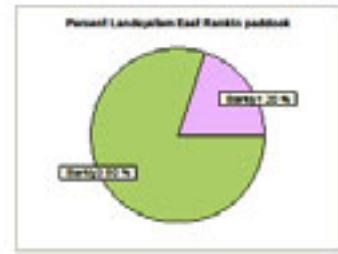
TOPOGRAPHIC AND PASTORAL INFRASTRUCTURE created by Land Information Services, Department of Lands and Planning for Regional Management Branch. Land Systems produced by Land Assessment Branch, Department of Natural Resources, Environment, The Arts and Sport. GRAPHIC produced by Department Planning & Infrastructure INFORMATION presented on this map is current to 17 August 2010.

WARNING - The Northern Territory of Australia accepts no liability for the accuracy of the information provided. Furthermore the Northern Territory of Australia does not warrant that this product contains the latest information available nor that the information is free from errors.



ADDITIONS AND ADJUSTMENTS to Mapping and Infrastructure have been made by Pastoral Industries, Department of Resources. Compilation & Editing by Tracy May, August 2010. Updated August 2011, G. Jenner

East Rankin paddock Land Systems and Class Description
 ■ Barkly1, broad level plains (black soil) plains; cracking clay soils
 ■ Barkly3, broad level plains (black soil) plains; cracking clay soils

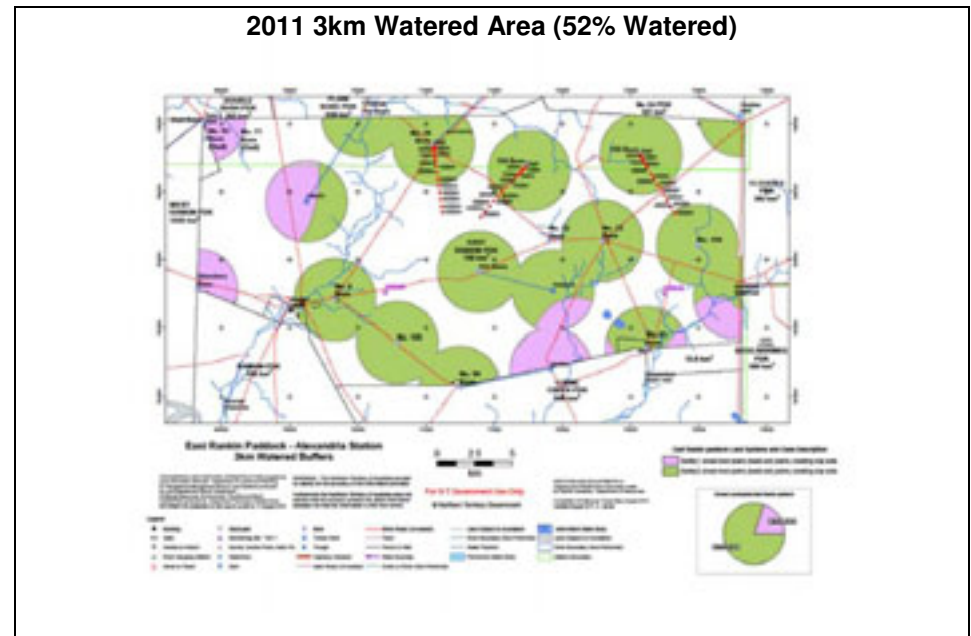
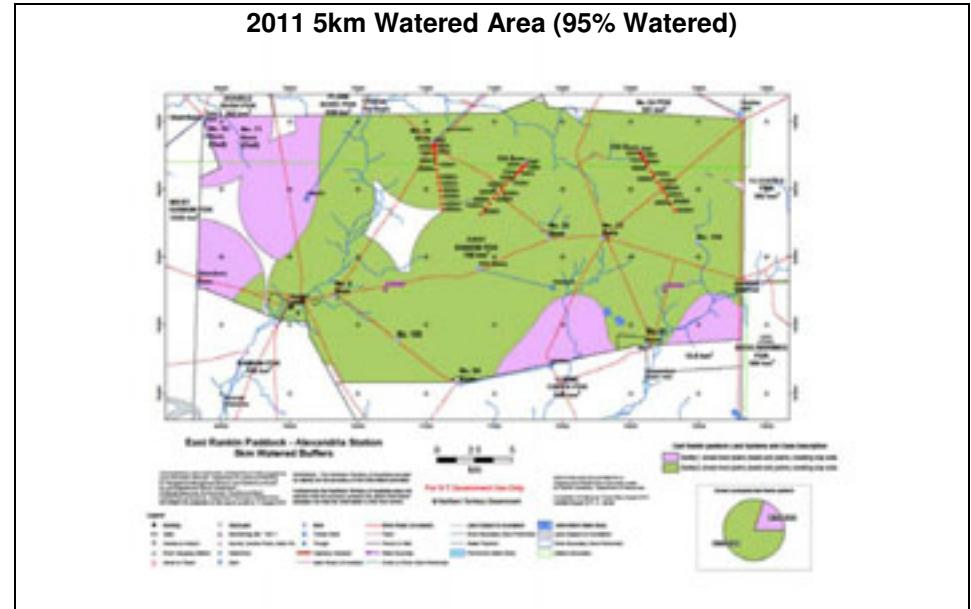
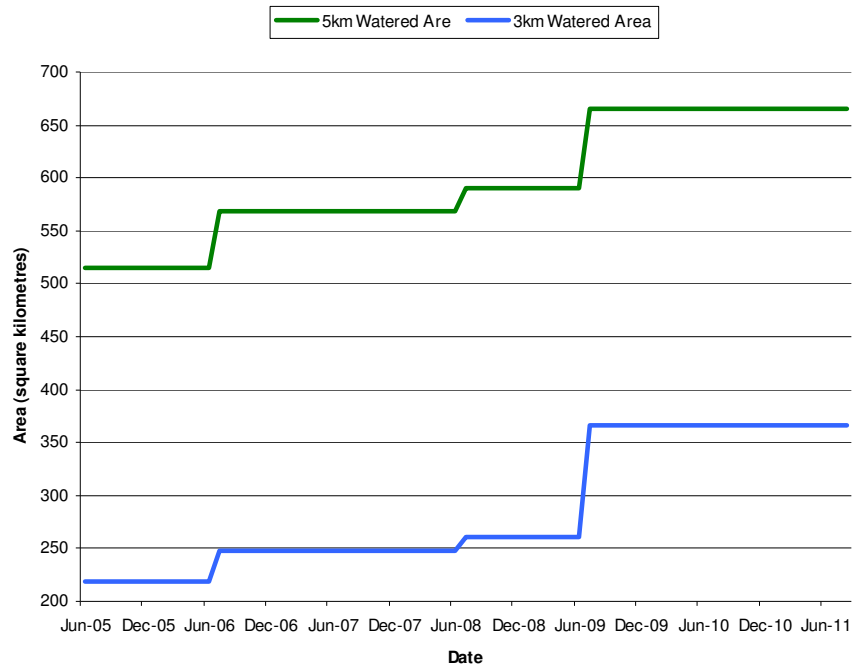


- Legend**
- Building
 - Stockyard
 - Bore
 - Minor Road (Un-sealed)
 - Land Subject to Inundation
 - Intermittent Water Body
 - ⚡ Gate
 - Monitoring site - Tier 1
 - Turkey Nest
 - Track
 - River Boundary (Non-Perennial)
 - ⚡ Airship or Airport
 - ⚡ Survey Control Point, Astro Fix
 - Trough
 - Fence or Wall
 - Water Pipeline
 - △ River Gauging Station
 - Waterhole
 - Highway (Sealed)
 - State Boundary
 - Perennial Water Body
 - Land Subject to Inundation
 - ⚡ Aerial or Tower
 - Dam
 - Main Road (Un-sealed)
 - Creek or River (Non-Perennial)
 - River Boundary (Non-Perennial)
 - Station Boundary

2011 Results

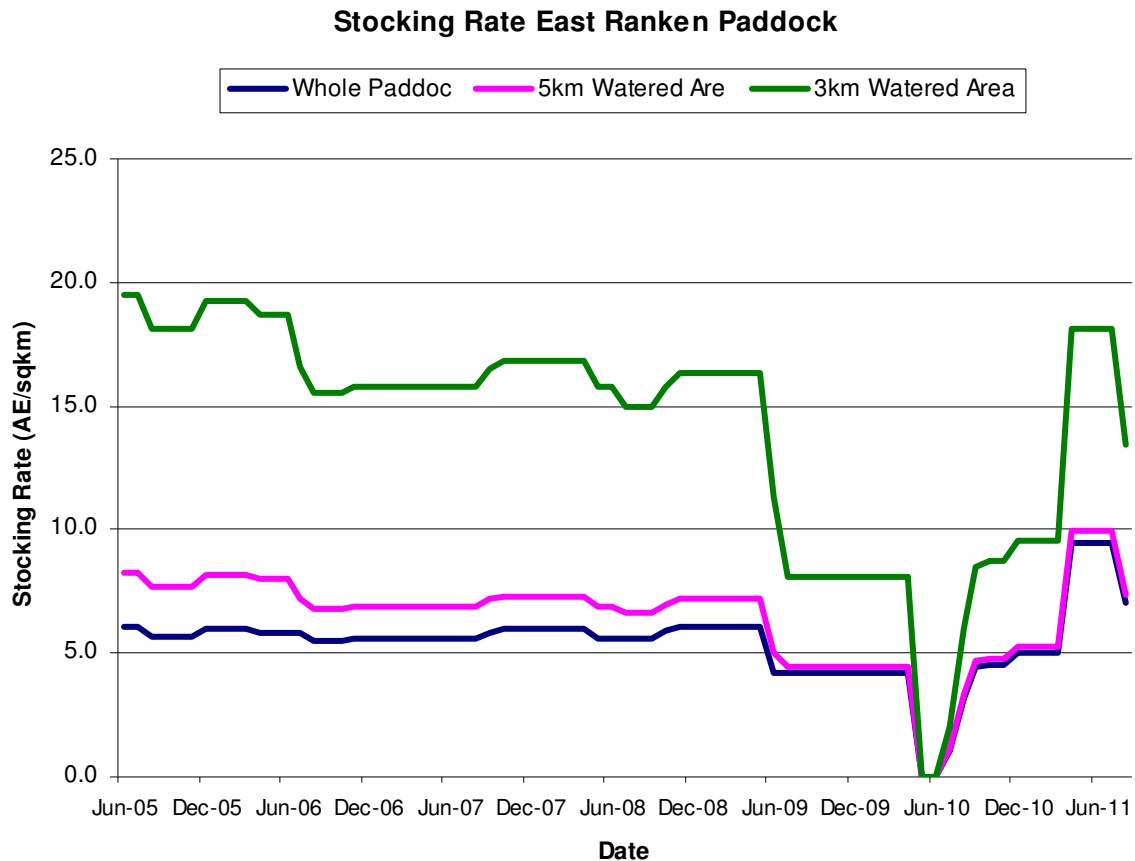
1. Change in Watered Area over Time

The total area of East Ranken paddock is 700km². The following graph shows how the watered area (at both 3km and 5km grazing radius) has changed since 2005 due to extra water point development.



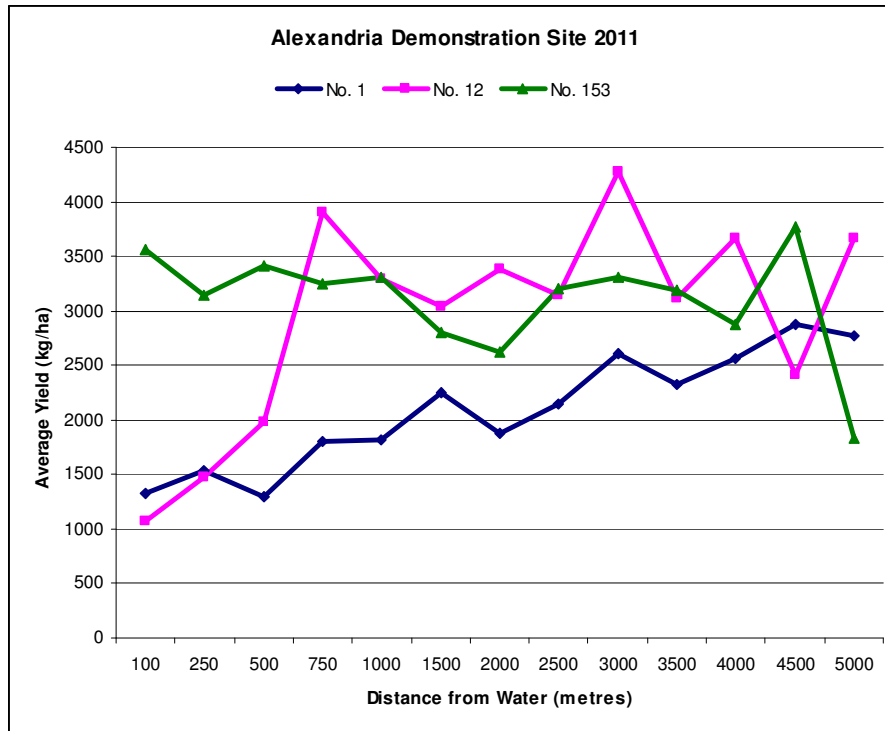
2. Stocking Rates

East Ranken paddock is made up of Mitchell grass pastures (Barkly 1 and Barkly 3 land systems). At a utilisation rate of 25%, recommended stocking rates for this type of country in good land condition range between about 4 and 15 adult equivalents per square kilometre (depending on rainfall). The stocking rates in East Ranken since 2005 have been within this range when considered on a whole paddock and 5km watered area basis. When considered on a 3km watered area basis, stocking rates have sometimes been higher than recommended, but the average is within the recommended range. What are the land condition and animal production implications of higher stocking rates close to water?



3. Pasture Yields & Palatability 2011

The graph below shows the average amount of standing pasture at different distances from water at the three bores in the study in June 2011. No. 10 bore (which has been in use for >100 years) shows a general increase in pasture as the distance from water increases. No. 124, which has been in use for six years has lower pasture biomass close to water but it increases quickly away from water. No. 153, which has only been in use for a year has high pasture levels close to water. The dip at the end of the graph for No. 153 is probably due to the overlap with the grazing radius of another bore (No. 154).



Palatable species made up most of the standing biomass at all three bores in June 2011.

