Hamersley Range

DEC (Karratha) will deliver this pilot project in collaboration with pastoral, government and industry landholders to ensure pastoral and ecological values of the Hamersley Ranges are maintained. The project will begin to establish a summer and winter burning program on DEC-managed lands and introduce strategic buffers on privately managed pastoral stations to protect the natural resources of the eastern Hamersley subregion.

For further information please contact:

John Silver, Rangelands NRM WA

Phone: 9941 9743
Email: **JohnS@rangelandswa.com.au**

Rangelands NRM
Western Australia

HOW DO YOU CAPTURE CARBON IN THE RANGELANDS?

Mark Alchin, Development Officer, Kununurra

Rangelands cover more than three-quarters of Australia's land mass and have long been the backbone to our economy primarily through mining, pastoralism and tourism. The Rangelands may provide a new platform of wealth generation for Australians by producing carbon offsets.

The three primary drivers which will determine the extent to which rangelands can actively capture the legacy load of carbon from the atmosphere are climate, fire and grazing. We have limited capacity to influence the local climatic conditions. However, we have significant scope to manage fire and grazing patterns. Recent achievements by those involved in the *Ecofire Project*[1] demonstrate the potential to reduce the risk of extensive, mid-to-late dry season fires which are known to emit substantial loads of greenhouse gases. Reduced incidence of late–dry season fires can also improve land condition and increase forage reserves (which can lead to higher carrying capacities). Similarly, there is evidence across Australia of how grazing management can be used to improve perennial groundcover and soil condition and thereby sequester and store carbon[2]. When you consider that approximately 20% (or 16.8 million ha) of the WA Rangelands is currently rated to be in poor condition and savanna fires emit over 11.5 million tonnes of greenhouse gases every year, it highlights the opportunity for improvement[3]. In this context, the *Carbon Capture Project* has been exploring the scope for carbon sequestration and storage in the Kimberley–Pilbara region.

During the 2009 dry season the *Carbon Capture Project* launched a major research effort to survey the existing carbon storage levels of the soil and vegetation on three pastoral stations in the

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[1] Legge, S, Kingswood, R, Swan, D, Murphy, S & Maher, B 2009, *Ecofire—A report on the prescribed burning program March to June 2009*, Australian Wildlife Conservancy.

[2] Bartle, R & Brennan, G 2006, *Cell grazing in a semi-arid environment—Does it pay?*, Southern Rangelands Pastoral Memo, September, 2006, WA Department of Agriculture and Food.

McCosker, T 2000, 'Cell grazing—the first 10 years', *Aust. J Trop Grassl. Soc. Aust.* 3:207–218.

[3] Based on latest data from pastoral lease inspection reports collected on behalf of the Pastoral Lands Board, emissions figure reported in: http://www.garnautreview.org.au

Kimberley–Pilbara. The stations were Cheela Plains (120 km west of Tom Price), Roebuck Plains (30 km east of Broome) and Mt Barnett (310 km east of Derby). The final round of field surveys was completed in August. Over 700 soil samples were collected, more than 9000 individual trees and shrubs were measured and grass and litter was removed from 1500 quadrats. The soil samples are currently being analysed for carbon and nitrogen levels. In the December edition of the *Pastoral Memo* I intend to provide preliminary findings of the research.

Soil drilling rig taking samples at Roebuck Plains Station

A common question I am asked is, 'how do you actually assess the amount of carbon in the Rangelands?'. As a preamble to the findings, I thought it would be beneficial to outline the process and methods involved in the field survey so you will have a better understanding of the final results.

Figure 1 provides a summary of the process involved in the carbon accounting method used in the *Carbon Capture Project*. The data obtained from this process will be statistically analysed and modelled to determine whether grazing or fire can have a measurable impact on the amount of carbon sequestered and stored on a pastoral lease.

The major challenge with carbon accounting work in the Rangelands is the issue of scale of the assessment. There is substantial variation across time and space in the Rangelands and this must be taken into consideration. This is one of the primary reasons why many people consider the Rangelands have limited to no long-term potential for sequestration and storage of carbon. Detecting change with a degree of statistical rigour is a challenge because there can be substantial background 'noise' that can be difficult to filter out in order to identify the major drivers of change (i.e. is the observed improvement in soil carbon levels due to the improved grazing or fire regime or is it simply due to an extended above-average rainfall cycle?). I remain optimistic that we can achieve this and the financial costs associated with it could be justified by the potential returns.

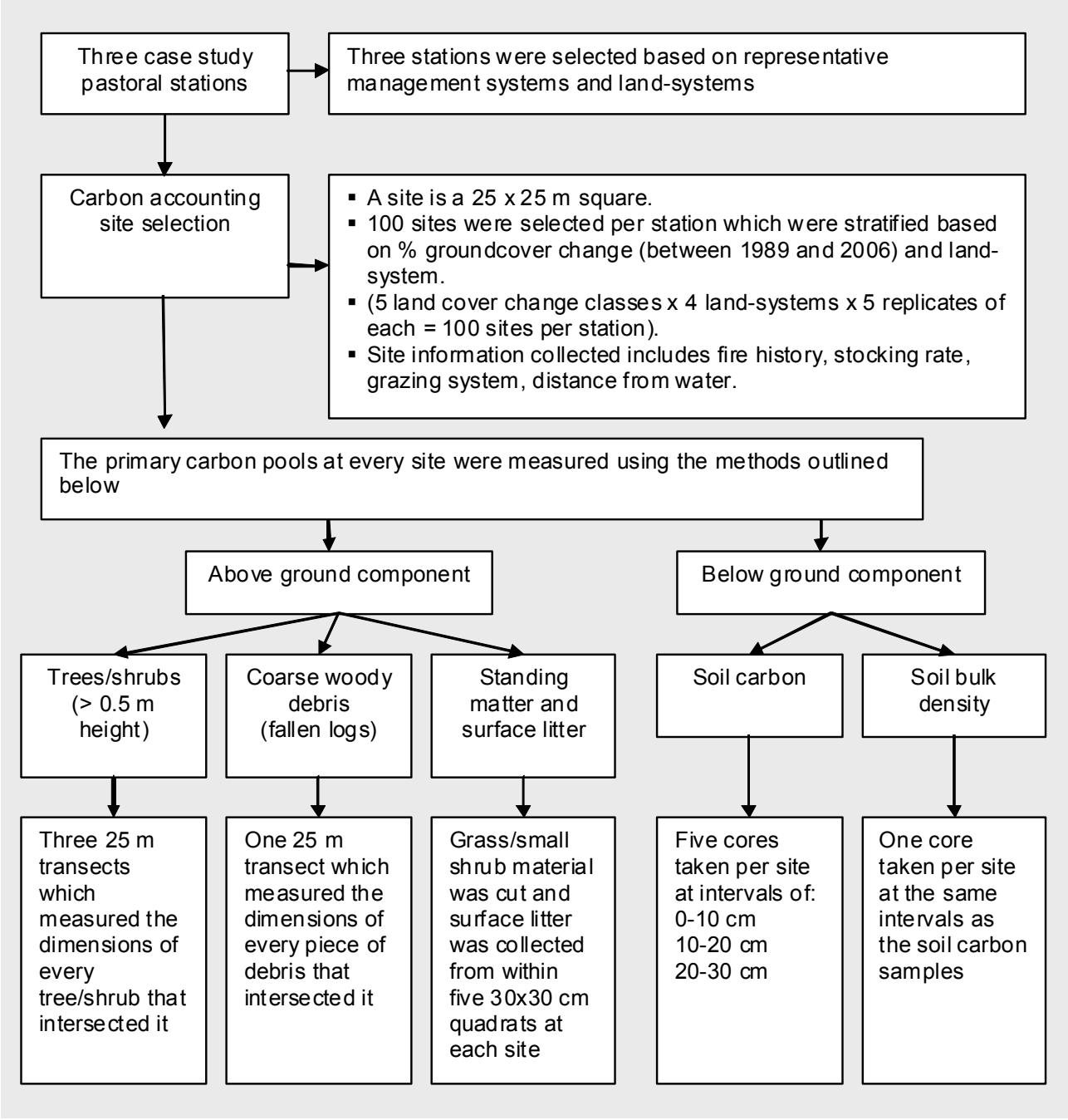

Figure 1 **Summary of carbon accounting process on three case study pastoral stations**

A reminder that under the current legislation pastoral leaseholders do not hold the legal entitlement to trade any carbon offsets that may be created on their leases, as it is a separate entitlement that must be obtained from the Department of Planning and Infrastructure.

The *Carbon Capture Project* will be completed in March 2010 and further work may continue depending on the nature of the results and the support of the industry and key stakeholders. I encourage you to contact me if you have any queries or suggestions.

For further information on the *Carbon Capture Project* contact:

Mark Alchin
Mobile: 0447 077 899 or
Email: **malchin@agric.wa.gov.au**

CARBON CAPTURE

Rangelands NRM Western Australia