

## PROCEEDINGS OF THE AUSTRALIAN RANGELAND SOCIETY

### 19<sup>th</sup> BIENNIAL CONFERENCE

Official publication of The Australian Rangeland Society

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#### Form of Reference

The reference for this article should be in this general form:

Author family name, initials (year). Title. In: Proceedings of the 19th Australian Rangeland Society Biennial Conference. Pages. (Australian Rangeland Society: Australia).

For example:

Bastin, G., Sparrow, A., Scarth, P., Gill, T., Barnetson, J. and Staben, G. (2015). Are we there yet? Tracking state and change in Australia's rangelands. In: 'Innovation in the Rangelands. Proceedings of the 18th Australian Rangeland Society Biennial Conference, Alice Springs'. (Ed. M.H. Friedel) 5 pages. (Australian Rangeland Society: Parkside, SA).

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# The Implications of the Emerging Carbon Economy for the Management of the Rangelands

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**Key words:** carbon sequestration, rangelands management, invasive native species.

### Abstract

Improving rangelands land management provides the single largest Green House Gas (GHG) sequestration opportunity in Australian agriculture with the potential to sequester 100 million tonnes (Mt) of CO<sub>2</sub><sup>e</sup> per year for 40 years (CSIRO, 2009). Improved herd management could lead to an additional 20% reduction in GHG emissions with an 80% reduction possible by 2050.

54% of all registered carbon projects in July 2017, totalling over 370 projects, are rangelands based projects. Forward contracts for sale of Australian Carbon Credit Units (ACCU's) through the Emissions Reduction Fund (ERF) from across the rangelands will see 271 projects deliver more than 139.5 Mt CO<sub>2</sub><sup>e</sup> of emissions either avoided or sequestered over the next 10 years, with over 13.3 Mt CO<sub>2</sub><sup>e</sup> already delivered. This is 73.8% of the total abatement contracted across all sectors, nationally.

Estimates of the full value of rangelands based ACCUs that have been sold or are contracted for sale over the next 7–10 years (based on the published average price of the first 5 ERF auctions) indicate a value of approximately \$1.65 billion. This compares favourably with the \$1.1 billion committed by the Australian Government over 7 years to the National Landcare Program for delivery across the entire country.

The emergence of the carbon economy provides a once in a generation opportunity for landholders. The alternative income can be used to develop infrastructure and improve land management in a pastoral economy dealing with increasing challenges to profitability. However, this new industry brings many challenges for land managers and regulators with potential conflicting outcomes between traditional pastoral practices and carbon sequestration projects.

### Background

The ERF is the Australian Government policy response for reducing GHG emissions. This enables activities across the full scope of the Australian economy to generate tradeable ACCU's to achieve the stated policy objective of attaining the lowest possible cost abatement. This includes the land sector (foresters, farmers and graziers) who generate ACCUs by undertaking land and livestock management activities that either increase GHG sequestration or reduce GHG emissions.

The eligible activities for generating an ACCU are outlined through project methods. The methods establish the rules for undertaking a project, explain how to carry out a project and measure the resulting reductions in emissions. Methods applicable to rangelands land managers, include emissions reductions activities such as feeding nitrates to beef cattle, improving herd management to reduce the emissions per kilo of beef turned off or managing uncontrolled late season fires in the northern sub-tropical rangelands.

All projects listed in the N.T. and the majority in W.A., are projects that avoid emissions through beef herd improvement or the management of savannah fires. The beef herd improvement method provides for emissions reductions through efficiency gains in pasture fed beef, where emissions are reduced while beef production is maintained or increased. Savannah fire management is a method for reducing GHG emissions through the implementation of strategically planned lower intensity early dry season fire management activities to reduce the risk and extent of higher intensity fires later in the season. This method is only applicable in areas that receive over 600mm of rainfall annually and there are currently 80 registered projects across WA, NT and QLD, with 48 that have already generated ACCUs.

Sequestration activities include carbon sequestration in soil in grazing systems, and forest vegetation projects. A forest is defined as a vegetation community with greater than 20% canopy cover of trees greater than two metres in height, occupying an area greater than 0.2 hectares.

The avoided deforestation method (Australian Government 2015) requires landholders to surrender clearance permits issued prior to 30 June 2010. In many cases across NSW these permits were intended to enable the clearance of invasive native species to improve native grass cover for grazing or to clear woody thickening for cropping.

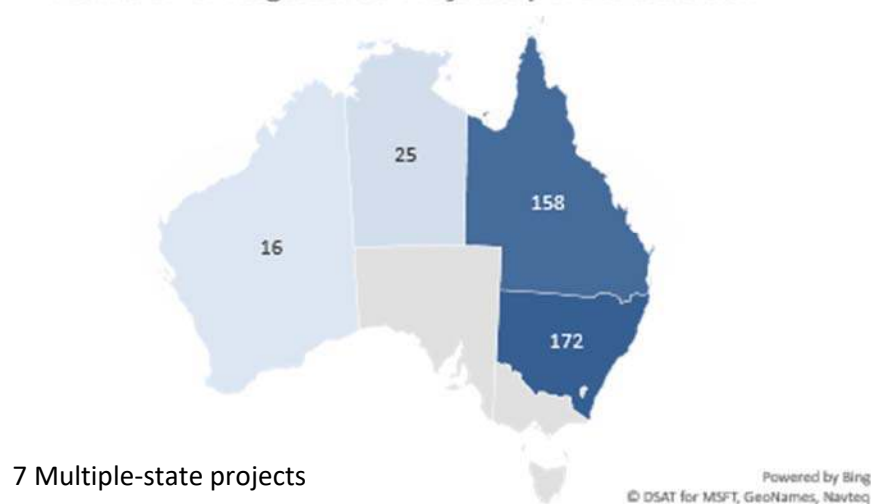
The HIR method (Australian Government 2013) requires landholders to change practices to support the regeneration of native species through in-situ seed sources, where regeneration has been suppressed for a period of at least ten years. This may involve changed fire regimes and the removal of feral and domestic grazing pressure.

The avoided clearance of native forest regrowth method requires landholders to cease clearance of regrowth for grazing or cropping activities. It is only applicable to properties where landholders can demonstrate at least 2 previous clearing events and the intention to undertake further clearance activities.

Since the first ACCUs were issued in 2011, over 214 rangelands projects have generated over 23 million ACCUs through vegetation sequestration projects (19.2 Mt CO<sub>2</sub><sup>e</sup>) and savannah burning projects (4 Mt CO<sub>2</sub><sup>e</sup>). Forward contracts under the ERF have identified the provision of 139.5 million tonnes of abatement over the next 10 years throughout the rangelands, which equates to 73.8% of the total abatement contracted across all sectors.

Participation in the carbon economy is not evenly distributed, with the largest number of projects occurring in Western NSW and South West Qld. This reflects the dominance of vegetation sequestration projects and the jurisdictional policy settings that enabled early participation. Both NSW and Qld are the only jurisdictions to confirm that pastoral leasehold land managers are able to generate and trade ACCU's from sequestration activities, and both jurisdictions had land clearing policy settings that enabled the early uptake of vegetation sequestration methods for the avoided clearance of a native forest or the HIR of a forest. Additionally, the Queensland government had previously developed a specific method to enable the generation of ACCU's from the cessation of the clearance of woody regrowth on country that had been cleared previously.

### Number of Registered Projects per Jurisdiction



### Discussion

The rapid uptake of projects across Western NSW and QLD provide land management challenges for individual property managers as well as jurisdictional based management and policies. There is the potential for conflict between the operation of the ERF and state or regional responsibility in managing

NRM outcomes. The current ERF arrangements recognise jurisdiction based legislation, however they do not consider the varied range of NRM issues that are dealt with at the policy level.

One example of the potential for conflicting policy outcomes at the regional and national level is the management of Invasive Native Species (INS) in Western NSW. These are native species of woody vegetation (within their natural geographic distribution) that regenerate densely following disturbance or invade plant communities where they previously did not occur, resulting in a change in vegetation structure and/or composition (State of NSW, Local Land Services, 2014). Many areas of the semi-arid rangelands of NSW that have a dense understorey of INS, were reportedly grassy plains with a few tall trees and shrubs at the time of European settlement. INS reduce pastoral productivity and increase the cost of managing livestock. They result in reduced cover of perennial grasses and herbage, leading to reduced stock carrying capacity and an increased risk of soil erosion, amplifying the effects of drought. (Jessop, 2009).

Landscape-scale changes in pastoral and ecological values due to thickening and encroachment are widely-documented in rangeland literature. Current management recommendations for INS are targeted at clearing existing areas and preventing further spread, to reinstate a mosaic grassy woodland supporting stable perennial pastures. This is in clear conflict with the desire to preserve and increase INS for carbon storage. Additionally, landholders are liable for losses of carbon stocks through fire. Increased groundcover through the management of total grazing pressure will increase the fire risk for those landholders, possibly leading to reduced carbon stores and reduced INS growth and spread. On the other hand, not all projects involve the proliferation of INS and funded projects provide a once in a generation opportunity for landholders to develop infrastructure to improve property management, or utilise carbon economy income to enable succession planning within family owned operations.

Examples such as some HIR projects in Western NSW, highlight the need for a broader approach to resolving conflicting outcomes. Due to the complex and varied nature of NRM practices (with both positive and negative outcomes), and the overlapping regional state and national policy responsibilities, a process / systems approach is needed that allows emerging issues to be dealt with as they develop.

At the individual property or project level, land managers need to consider the potential risks and opportunities of implementing carbon projects. This, like any enterprise change, requires an understanding of the potential income, costs of production and the impacts on existing income generating activities.

Potential income is often clearly demonstrated through effective carbon project planning. This involves calculating the number of ACCU's generated per hectare per year, which when combined with an understanding of ACCU value and sales contracts, provides for a clear indication of dollars / hectare. The ERF then provides for forward sales contracts of up to 10 years which provide a guaranteed price and volume of purchase, with a commensurate requirement for delivery. If the pastoral enterprise maintains comprehensive records, this can be compared to the dollars/hectare being received through current enterprise activities, however this is not always the case.

The costs of production are much less clear for landholders engaging in a new industry or activity, making it hard to fully understand the potential financial viability of a carbon project. With any project, there are costs involved in undertaking the actual on-ground activities and the additional costs of the administration requirements to generate an ACCU (including auditing, monitoring and reporting). This is further compounded by the need to provide for 'permanence' for sequestration projects, which requires landholders to maintain the sequestered carbon for a period of either 25 or 100 years.

Understanding the financial returns and the risks involved in the current pastoral business and the potential carbon projects, is essential for land managers to make informed decisions and capitalise on the opportunities available.



## Conclusion

The emergence of the carbon economy provides a new income source across the rangelands. The alternative income provides the opportunity to assist family succession, develop infrastructure and improve land management in a pastoral economy dealing with increasing challenges to profitability (climate change, pasture decline, total grazing pressure declining terms of trade).

This new industry brings many challenges for land managers and regulators. Understanding the full cost of production and risks associated with a new industry is difficult and there are potential conflicting outcomes between traditional pastoral practices and carbon sequestration projects. This makes comparing existing pastoral practices with the potential new activities very difficult for land managers to consider.

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