

## THE BINALONG CARBON PROJECT : CARBON CYCLING AND STORAGE IN A GRAZING LANDSCAPE ON THE SOUTH-WEST SLOPES OF NSW

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The Binalong Carbon Project analyses the carbon dynamics of the Binalong farming area against the background of the natural carbon dynamics. It focuses on the region's potential to minimise local emissions while boosting its capacity to contribute to the global effort to restore and maintain the overall carbon balance.

The project supports the idea that land managers are central to the climate debate. They provide essential food and clothing, protect vital eco-system services, and are in the best position to manage vegetation to restore and, in due course, maintain the carbon balance. The project therefore addresses some of the conference themes: sustainable agriculture and sustaining and improving the physical environment.

The project was based on a 1997 management plan that the NSW Department of Land and Water Conservation developed for the 41k hectares in the Binalong region. This plan documented the vegetation cover and productive capacity of the region at that time. Further stimulus came from a 2009/10 'snapshot' audit of greenhouse gas emissions, flows and stores in the mixed grazing area of the Lower Apsley River Landcare. Using the data from these two projects and employing the freely available Landsat data for 1997 and 2011, 40 distinct classes were mapped and gradually reduced to 7 broad vegetative classes that were easily recognisable by landholders. These classes were validated by superimposing the Landsat data onto Google Earth images for the area and verified with the ten local landholders who took an active role in the project by providing details of their farm management strategies and practices.

The project highlighted the need for a region to be seen as an interacting atmosphere/biosphere system in which any change can have long term effects. The "woody weed" regrowth that was controlled by Aboriginal people through their systematic management of fire now has to be controlled by grazing management and/or occasional tillage. The results of the project also indicate that the 2006 drought had a much more significant effect than might have been expected: extensive plantings undertaken after 1997 to remedy excessive salinity and erosion appear to have had little effect on the carbon balance (many of the plantings died); native grassland in the area has increased by 15%, while exotic grasses declined by 27%; old remnant trees have decreased in number, and overall soil carbon has decreased slightly. The largest stores of carbon have been found in heavily wooded areas, especially on gravelly ridge tops with no competing grasses. Consequently the poorest stores of carbon are in grassland areas, possibly the result of overgrazing in the past.

Sustainable farming practices work to enhance natural systems while economically producing the food and fibre people need. From a carbon point of view this is best achieved through farming methods which maximise photosynthesis (to increase biomass) while minimising disturbance to avoid the loss of stores biomass and soil carbon.