Whole of Paddock Rehabilitation - Novel approachs enhancing eucalypt density within paddocks in south-eastern Australia

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The ongoing loss of native trees across paddocks in south-east Australia is accelerating, and is a challenge to reverse due to the high cost and vast scale. Whole of Paddock Rehabilitation (WOPR), is an agri-environment scheme that is supported by the Australian Government and facilitated by Greening Australia, an environmental non-government organisation. WOPR seeks to establish native vegetation at the scale of the commercial paddock in order to provide a range of ecosystem services including agricultural production and conservation. Our study set out to assess the success of WOPR by quantifying the density of eucalypt trees directly sown from seed and by gauging farmers' thoughts on the program to date. Nine study sites were chosen from the Southern Tablelands of New South Wales that were sown with native vegetation. A complete census of eucalypts was mapped in every paddock (16,000 individuals in total). The average WOPR site in the study was five years old (as of spring 2015), was 22±20 ha in size, and contained 1,731±1607 WOPR eucalypts at an average density of 99±172/ha. Distribution of eucalypts within and between the paddocks was highly variable (e.g. 159-665 per sown row). Eucalypt density was strongly associated ($p<0.01$) with rainfall in the year seeded and belts' proximity to blocks of older trees (shelter). The vast majority of eucalypts had a diameter at breast height of ≤ 5cm; grazing history was strongly associated with tree size. There was no correlation between the amount of eucalypt seed sown and the number of eucalypts/km of seeding. Using just seed cost, the average WOPR eucalypt costs $0.76 each. Participating farmers were pleased with their WOPR paddocks, identified a diversity of production, cultural, and ecosystem services provided by the WOPR paddocks, and held Greening Australia in high regard. They identified knowledge gaps and areas for further research.