

Australian Centre for Biodiversity

Past, present and future health of river red gum along the Victorian Murray River floodplain

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The project is designed to assess present and past health, and to predict future health of river red gum populations in northern Victoria. This will cover populations across the Murray floodplain, and the lower Ovens and lower Goulburn Rivers. This is a three-year ARC Linkage project involving the Department of Sustainability and Environment, North East CMA, Goulburn-Broken CMA, North Central CMA and Mallee CMA. The project involves four phases:

1. Assessment of present patterns of river red gum health

The present health of populations has been mapped through a combination of field surveys and remote sensing. A condition index was devised among the industry partners (DSE, CMAs) and researchers based on indicators such as crown vigour, crown density and epicormic growth. This condition index was used to assess the condition of a range of sites across the region. The condition of these populations was then modelled against environmental and remotely sensed variables. This allowed the condition of river red gum populations to be mapped across the whole region. The condition assessment determined from this mapping exercise was validated by ground-truthing a subset of sites that covered a range of predicted condition.

2. Determine past rates of decline in river red gum health

Historical aerial images have been collected for areas along the Murray River floodplain to determine the rate of tree decline over time. An image classification procedure has been designed to estimate changes in canopy cover over time. These rates of decline will then be interpreted with respect to past management regimes.



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3. Environmental drivers of tree health

Sites will be chosen to cover a range of stand condition. Environmental variables such as flooding, rainfall and groundwater history, geology, and topography will be collected. Stand measurements will include stand structure (tree height, dbh, demography), physiological measures (shoot growth, chlorophyll fluorescence, xylem pressure potential) and the condition index. Multivariate analyses of these environmental variables and tree measurements will be used to assess factors contributing to the health of river red gum populations.

4. Development of a model that predicts the future health of river red gum populations

A spatial explicit model will be built to predict the likely health of river red gum populations 5, 10 and 50 years into the future. This will incorporate findings on the current health of populations (Phase 1), effects of past management regimes on the rate of tree decline (Phase 2) and environmental drivers of tree decline (Phase 3). Such a model will allow land managers to define areas of high priority for environmental water allocations and to determine appropriate flooding regimes.

Research Partners



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