



focus on **NRM** research

River red gums in cotton landscapes

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What are you researching?

Over the past ten years, we have illustrated the value of river red gums in providing a range of ecosystem services, including carbon sequestration and storage, erosion mitigation and biodiversity conservation.

River red gums also capture the hearts and minds of Australians, inspiring art and poetry and playing an important spiritual role for indigenous cultures. As such, river red gums are an easily identifiable icon species and an important focal point for monitoring riparian health and condition.

However, dieback of river red gums in a number of cotton catchments has become a concern for cotton growers and the wider community, with the cause of this dieback remaining uncertain. Tree dieback impacts biodiversity conservation value and carbon sequestration rates. As a result, this project is investigating the causes of river red gum dieback and management strategies to improve tree health to maximise ecosystem service provision.

What have you found?

Our research has shown that well-managed, good condition river red gum ecosystems on cotton farms provide important habitat for threatened and declining woodland birds.

Riparian areas provide biodiverse, structurally complex, well-connected habitat and are therefore home to species that are not found elsewhere on the floodplain. Important species found in riparian

areas on cotton farms include black-chinned honeyeater, crested bellbird, rufous whistler, red-capped and eastern yellow robins, jackie winter and brown treecreeper.

In addition, riparian areas are highly productive and sequester and store large amounts of carbon. We found 300 tonnes of carbon per hectare stored in river red gum woodland near Narrabri, and sequestration rates during La Niña conditions of 2.5 tonnes of carbon per hectare each year.



This carbon stabilises soils and riverbanks, stopping slaking and dispersion of soil aggregates, and reduces sediment yields into river systems.

We are currently measuring tree water use and water potential (stress) under a range of conditions, including different restoration scenarios commonly employed in riparian zones on cotton farms. This investigation will provide information on how trees in different situations respond to environmental conditions (eg. temperature changes, rainfall, river flows, changes in groundwater levels) and determine if restoration has any impact on tree health. We have recently completed a study into circumferential variation in water use rates on different axes of large old trees to get a better handle on overall tree water use.

Why is it important?

Ecosystem services are vital for sustainable agriculture and general well-being of rural communities. Many ecosystem services provided by river red gum vegetation communities contribute directly to agricultural productivity, such as nutrient cycling, water filtration, breakdown of chemicals, natural pest control and pollination.

In addition, cotton growers can illustrate good environmental management and stewardship by conserving biodiversity on farms. Environmentally conscious consumers demand sustainably produced products, and minimising carbon footprints is one way growers can illustrate their commitment to this goal.

How can I apply the research/what should I do about it?

Well-managed, good condition riparian areas are an integral part of healthy catchments and sustainable agricultural landscapes. Growers who can maintain healthy trees, good groundcover, diversity of native plant species, complex habitat structure and connectivity will benefit from the services provided by riparian ecosystems.

Where do I go for more information?

Information and resources to help growers manage their riparian areas can be found at:

- the CottonInfo Natural Resource Management webpage:
www.cottoninfo.com.au/natural-resource-management
- the *myBMP* Natural Assets module:
www.mybmp.com.au
- the Riparian Land Management Guidelines for the Cotton Industry:
www.cottoninfo.com.au/publications/managing-riparian-lands-cotton-industry

Or, contact:

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