focus on NRM research

Riparian vegetation and land management

Dr Sam Capon & Dr Stephen Balcombe, Griffith University

What are you researching?
We are investigating where, when and how riparian vegetation regeneration occurs across the northern Murray-Darling Basin.

We are examining spatial patterns in plant dispersal, germination, seedling establishment and reproduction at sites across the MacIntyre/ Weir Rivers, the Balonne River and its tributaries, and the Barwon-Darling. Our research aims to identify which factors are important in driving these patterns including hydrology, tree canopy cover, ground cover, grazing etc.

What have you found?
Very few seedlings of river red gum (Eucalyptus camaldulensis), coolibah (E. coolabah) or lignum (Duma florulenta) have been recorded during our surveys. In contrast, river cooba (Acacia stenophylla) seedlings have been abundant and widespread. Significant numbers of whitewood (Atalaya hemiglauca), creek wilga (Eremophila bignoniiflora) and weeping myall (Acacia pendula) seedlings have also been observed.

Our research indicates that soils, surface litter and animal droppings all provide important sources of propagules for vegetation regeneration in these habitats. Litter appears to be a particularly significant source for woody species, including eucalypts. Our experiments highlight canopy cover and litter load as key drivers of local vegetation dynamics.

Shade, for example, appears to enhance the diversity and abundance of understorey vegetation under drier conditions while, under wetter conditions, leaf litter inhibits seedling emergence from riparian soil seed banks that, according to our experiments, are dominated by weed species.

Why is it important?
In comparison to many other ecosystems, riparian systems provide a disproportionately high number of ecosystem functions, goods and services with respect to the area they cover, eg. provision of habitat to terrestrial and aquatic wildlife, riverbank stabilisation, water filtration etc. Our research seeks to inform both water resources management and riparian land management so that these benefits can be best protected and enhanced.

Our results indicate that riparian vegetation in the northern Murray-Darling Basin has the potential to change considerably and may already be undergoing a shift. Relatively narrow bands of taller and more open Eucalypt dominated riparian woodland that fringe many channels in the region, for example, may be encroached upon by shrubby, fast-growing and more terrestrial woody species.

Woody thickening is currently a global phenomenon that has been observed in a wide range of ecosystems, especially in dryland regions, and is often attributed to increasing concentrations of atmospheric carbon dioxide. Our research suggests that the scope for such vegetation change can also be strongly influenced by local factors, particularly canopy and litter cover.

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

Our results indicate that canopy cover and litter loads are particularly significant drivers of riparian vegetation dynamics at local scales. Consequently any land management activities that impact on these, including clearing and grazing, have the potential to affect vegetation regeneration.

Declines in the abundance and diversity of understorey plants, including grasses and forbs, for example, are likely to occur during drier periods as a result of clearing.

Additionally, disruptions to litter, either through clearing or grazing, may promote the establishment of riparian weeds.
Activities associated with grazing, such as the intentional planting or movement of fodder shrubs (and propagules), may also exacerbate any woody thickening of riparian woodlands that may be occurring.

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:

Dr Samantha Capon
Australian Rivers Institute
Griffith University
Ph: 0402 217 899
Em: s.capon@griffith.edu.au

Dr Stephen Balcombe
Australian Rivers Institute
Griffith University
Ph: 07 3735 7308
Em: s.balcombe@griffith.edu.au

Stacey Vogel
Natural Resources Technical Specialist
CottonInfo
Ph: 0428 266 712
Em: staceyvogel.consulting@gmail.com

This project is funded by the Cotton Research and Development Corporation.

Australian Government
Cotton Research and Development Corporation