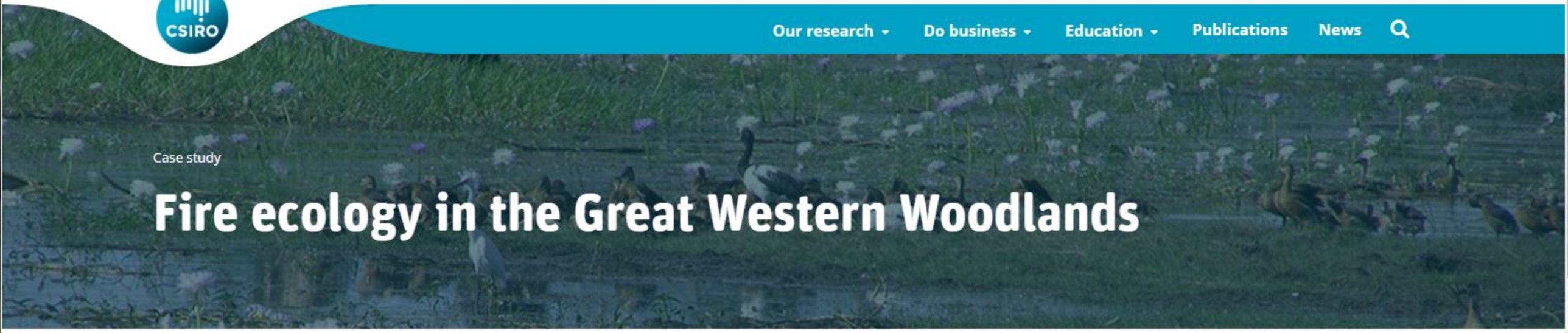

Case study

Fire ecology in the Great Western Woodlands

Last updated: 6 December 2016

The study of eucalypt communities in the Great Western Woodlands is helping us to understand how they persist in a fire-prone landscape and assisting future fire management.

The challenge

A fire sensitive but slowly maturing community

The Great Western Woodlands in Western Australia feature stands of highly fire-sensitive eucalypts in an extremely arid climate.

Unlike most other Mediterranean-climate ecosystems, mature woodlands in the Great Western Woodlands rarely burn due to their open canopy structure and patchy distribution of fuel.

Fires that do occur are typically stand-replacing, that is, they kill off the overstorey. Woodland composition and structure takes hundreds of years to recover.

However, in recent decades there have been a seemingly unusually high number of wildfires that collectively have burnt a large proportion of the Great Western Woodlands.

Understanding how the landscape changes following a fire, and the time frame over which these changes occur, is crucial for biodiversity conservation. This knowledge is also important to help assess the long-term threat posed by recent fires to the natural and cultural values of mature woodlands.

Mature gimlet woodland ©

Recently burnt gimlet woodland ©

Our response

The gimlet fire chronosequence

In collaboration with the Western Australia Department of Parks and Wildlife and the **Terrestrial Ecosystem Research Network (TERN)**, we are studying the responses of the gimlet (*Eucalyptus salubris*) woodlands to stand replacement wildfires. Gimlet is a tree killed by fire and is a dominant canopy species across the Great Western Woodlands.

A key component of the research has been the development of methods to estimate the time since fire of long-unburnt vegetation. Using satellite imagery and tree size and age relationships, we have established a fire chronosequence of 76 sites with a range of three to 400 years since fire.

We have assessed changes in plant and animal species composition and function, vegetation structure and flammable fuel at these sites, and are embarking on quantifying changes in woodland carbon stocks.

This method of ageing gimlets is also being applied more widely across the Great Western Woodlands to determine if the recent frequency of fires is unprecedented over the period in which existing woodland stands developed.

Taking a core from a gimlet for the development of methods to estimate the age of trees. ©

The results

Understanding the threat of large and frequent fires

Gimlets are very slow growing, with important changes in plant and animal community composition, function, vegetation and fuel structure occurring over many centuries.

Following fire, regenerating woodlands pass through a period of higher cover and connectivity of key litter and canopy fuel layers before they develop into less flammable mature woodlands. This means that, while more mature woodlands are more resistant to fire, it can take 100 years plus for the tree community to reach this stage.

Any increase in the frequency of fires would lead to losses of woodlands and their cultural and natural values, and pose a threat to the long-term persistence of mature woodlands in the Great Western Woodlands.

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Find out more

- Dr Suzanne Prober
- Dr Carl Gosper
- Dr Colin Yates (WA Department of Parks and Wildlife)