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The character and behaviour of flood plain vegetation landscapes

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Abstract Flood plains are an important component of the riverine landscape providing a range of ecosystem goods and services. In dryland environments, flood plains are a refuge for a wide variety of plant and animal species. Flood plain features often appear to display relatively coarse gradients of structure with distance from the main river channel in response to decreasing flow efficiencies and increasing elevation. However, when viewed at smaller scales, flood plains are heterogeneous landforms representing a mosaic of patches embedded within the large flood plain ecotone. This may occur because smaller scale variations in topography may disrupt longitudinal and lateral patterns. Flood plains are dynamic ecosystems and an obvious example of this is changing vegetation patterns overtime, which create a dynamic heterogeneous vegetation environment in flood plains. Complex patterns of change in flood plain landforms and associated vegetation influence the productivity and biodiversity of these systems. Consequently, understanding the character of flood plain vegetation landscapes and the changing nature of vegetation patches over time may be an important tool for managing these ecosystems. This study investigates how the flood plain vegetation-patch character of the lower Murrumbidgee River, Australia, changes over time. A series of vegetation community maps of the flood plain, spanning a period of 40 years, were used to determine the landscape patch character of this fragmented landscape. Patch characteristics such as size, patch number, length and shape complexity were calculated for each vegetation state and subjected to a range of uni- and multivariate statistical analyses to elucidate patterns in the flood plain landscape over time. The influence of changing hydrology on this important flood plain ecosystem is discussed.

Key words flood plain vegetation landscapes; fragmentation; ecotones; patch mosaics