Local provenance and identification of historical refugia in *eucalyptus leucophloia* in the Pilbara David Coates, Bronwyn Macdonald, Shelley McArthur

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Symposium: Seed Sourcing Guidelines for Restoration Success

Traditional approaches to seed collection for restoration that typically advocate a narrow definition of the 'local provenance' for a species may not be appropriate for widespread species in a time of changing climate. The level and extent of underlying genetic diversity can be an indicator of local adaptation and provide information for determination of appropriate seed collection zones. Genetic diversity in Snappy Gum (*Eucalyptus leucophloia*), a widespread species in the Pilbara region of Western Australia, was investigated to determine contemporary and historical patterns. Nuclear genetic diversity was high, typical of that found in other eucalypt species with wide spread distributions. Population differentiation was low with only 6% of variation partitioned between populations. There was little structure across the Pilbara with no clustering of populations based on geographical proximity or in association with obvious topographical, physiogeographical or geological features. Populations towards the edges of the species distribution within the Pilbara showed greater levels of differentiation from populations within the species main range. Analysis of diversity in the chloroplast genome, which provides a perspective on historical influences, showed a signature of high diversity in the Hamersley and Chichester Ranges indicating they have acted as refugia during climatic oscillations in the Pleistocene. Seed collections for restoration of mine sites within the ranges should focus primarily on populations within the ranges as these harbour the reservoir of genetic diversity that has persisted through historical times.

SOCIETY FOR ECOLOGICAL RESTORATION

Society for Ecological Restoration Australasia Conference

Perth, Western Australia, Australia

28–30 November 2012

Program and Conference Abstracts

L. Commander, J. Stevens and K. Dixon (eds.)