CONSERVATION GENOMICS FOR TAXON DELIMITATION AND MANAGEMENT OF RARE AND THREATENED PLANTS

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Conservation of threatened plants requires a range of information to ensure appropriate management strategies. Genetics, and more recently genomics, can provide important information to inform such strategies, such as providing knowledge of genetic diversity and structure, identification of conservation units, assisting in resolution of taxon boundaries among closely related entities, and understanding hybridisation and hybrid taxa. While genetics is now recognised as providing critical information for conservation of threatened species, genomics provides greater analytic power, particularly in the context of resolution of cryptic taxa where the distinction between population level differentiation and species identification can be challenging.

Here we demonstrate the value of genomics in contributing to management of threatened species using several case studies. Genomic analysis of species of *Seringia* in the Kimberley have identified unexpected taxon relationships, identification of a hybrid taxon and evidence to support synonymising a currently recognised threatened species and a common species. Genomic analysis of *Banksia biterax*, a species with populations in three disjunct locations in south western Australia has confirmed significant genetic structure among the locations providing information to support management of two very small isolated populations. Genomic analysis of several related eucalypt species in south western Australia has identified clonality, limited genetic structure across a disjunct distribution of tree and mallee populations, and confirmation of putative parents of a species of hybrid origin.

Dr Margaret Byrne is recognised as a leading conservation scientist who has been at the forefront of applications of genetics and genomics in Australian plants to inform conservation of rare and threatened plants, and biodiversity conservation at landscape scales in relation to pollen dispersal, remnant viability and restoration. She is a member of the National Academy of Sciences Committee on Ecology, Environment and Conservation, and on the advisory boards of numerous state and national science initiatives, including the Western Australian Biodiversity Science Institute, Western Australian Marine Science Institution, Terrestrial Environmental Research Network, and Centre of Excellence in Environmental Decisions.

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