Biosystematics 2023
Celebrating the past | Planning the future

**Landscape genomics of the Eastern Red Gums (*Eucalyptus* sect. *Exsertaria* subser. *Erythroxylon*) in New South Wales: parapatric speciation or a legacy of population isolation?**

Patrick S. Fahey (Research Centre for Ecosystem Resilience, Botanic Gardens of Sydney and The University of Queensland); Marlien M. van der Merwe (Research Centre for Ecosystem Resilience, Botanic Gardens of Sydney); Patricia M. Hogbin (Research Centre for Ecosystem Resilience, Botanic Gardens of Sydney); Maurizio Rossetto (Research Centre for Ecosystem Resilience, Botanic Gardens of Sydney and The University of Queensland).

As part of the Restore and Renew program, we have developed a large genomic dataset including all members of *Eucalyptus* sect. *Exsertaria* subser. *Erythroxylon* with the goal of developing genetically informed ecological restoration guidelines for the individual species. However, our approach of focussing on a phylogenetically constrained group has led to the discovery of complex, cross-species genetic patterns, where morphological species show limited genetic divergence and ongoing geneflow. Indeed, in some regions, we show there is no way to assign large and ecologically dominant populations to a single taxon, both morphologically and genetically. This is hypothesised to be due to historic distribution shifts in response to climatic changes, leading to divergence of lineages that have subsequently established secondary contact zones. These findings suggest that the conceptualisation of species as discrete, distinct and objective entities may be insufficient to allow for appropriate study, management, and restoration of natural populations, and may even be holding these practical outcomes back.

Patrick Fahey: patrick.fahey@botanicgardens.nsw.gov.au