Margaret Byrne

Biography

Dr Margaret Byrne undertakes plant conservation and evolutionary genetics research with a current focus on climate adaptation, and is responsible for science and conservation policy as Executive Director, Science and Conservation, Western Australian Department of Biodiversity, Conservation and Attractions.

EcoTAS abstract

SYMPOSIUM: Assisted migration under climate change

Wednesday, November 29, 2017

4:00 PM - 6:00 PM

Brokenback Room

Oral presentation

Byrne M [1] , Hopley T [1]

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Analysis in a wide range of species and habitat contexts is needed to determine the extent of climate adaptation in plant species. One habitat context that has not been investigated to date is riparian systems, that often traverse climate gradients. We used genotyping by sequencing to investigate signals of adaptation to environmental variables in two species along the Warren River that have differing distribution and different patterns of genetic structure, gene flow and connectivity. We found no signals of adaptation to climatic gradients in Astartea leptophylla that is restricted to the banks of the main river where there is less reliance on rainfall for moisture availability, decoupling of local and regional climatic features, and high levels of gene flow. High gene flow allows maintenance of standing genetic diversity providing a basis for plastic response to changing environments without need for gene migration among distance populations. In contrast, the more widely distributed Callistachys lanceolata showed a strong signal of adaptation to bioclimatic variables, particularly precipitation variables associated with extreme time-periods. Low gene flow and high genetic differentiation in this species provide conditions for development of local adaptation across a climatic gradient since genome mixing is restricted. Assisted gene migration/climate-adjusted provenancing would be a climate adaptation strategy that would mimic historical gene flow and maintain genetic diversity required for adaptation to changing climates. Our study found interacting facets of environment, gene flow and genetic structure influence development of adaptation in these riparian species.

Effects of gene flow and connectivity on signals of adaptation in two riparian plants

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Kiri (Reihana) Spraggs

EcoTAS abstract

The widespread degradation of water quality and quantity and its state of mauri, is a significant issue for Māori. This issue is represented by widespread degradation of

Open session (1)

Monday, November 27, 2017

3:45 PM - 5:45 PM

Sugarloaf Room

Oral presentation