




Harnessing Genomics to Restore Resilience in East Gippsland's Threatened Flora

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Summary

Over 100 plant species in East Gippsland, Victoria, are listed as vulnerable or endangered. Many exist as small and/or localised populations and, in most cases, their known distributions were severely burnt in the 2019/20 bushfires. The post-fire recovery and establishment of risk mitigation plans for a number of these species are the focus of this collaborative work. Together, Envite Environment, La Trobe University, the Friends of Mallacoota and partners have embarked on an initiative to secure the future of range-restricted flora in East Gippsland through:


-  (1) **Surveys** to assess the post-bushfires status and distribution of 10 key species in the wild;
-  (2) Assessment of the **genomic diversity** (Box 1) of surviving resprouting or emerging plants to aid practical management recommendations for six species;
-  (3) Propagation of seed and cuttings to serve as **insurance populations** in case of future environmental catastrophes.



Progress to date

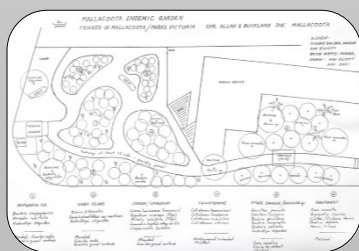
 **Surveys** have expanded known locations for one species: *Spyridium cinereum*, which, along with *Mirbelia rubrifolia*, has flourished post-fire with increased numbers of plants having regenerating from seed. Others (*Callistemon kenmorrisonii*, *C. nyallingensis*, *Banksia croajingolensis* and *Eupomatia laurina*) have resprouted from lignotubers, but evidence of post-fire seedling establishment is non-existent. Persistence of *Acacia caerulescens* is being assisted through revegetation plantings, which were a focus of our surveys to complement existing work.


Survey findings have already been used to inform management to safeguard four species, including through: (a) modification of slashing regimes and roadside developments to protect populations of *S. cinereum*, *M. rubrifolia* and *E. laurina*, and (b) control of invasive weeds threatening *E. laurina* and *C. kenmorrisonii*.

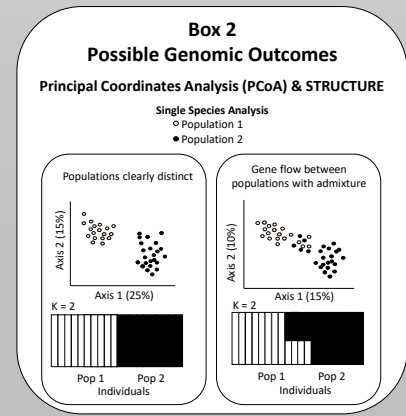
 **Genomics:** Over 650 samples were collected and sent for DArTseq analysis. This SNP-based approach is currently underway (Box 2).

Box 1

Many of the taxa are narrow endemics with hybrid origins postulated for some. Aside from **hybridisation**, genomic concerns include possible **clonality**, risk of **inbreeding**, **low diversity** and **reduced gene flow**.



 **Insurance populations:** The Friends of Mallacoota have built a nursery complex with seedlings now growing for most taxa, including from seed sourced through the Victorian Conservation Seedbank housed at RBGV. Design plans are in place to install a display garden in Mallacoota to showcase local threatened plants.



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