AIATSIS SUMMIT | 05–09 JUNE 2023

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South West Aboriginal Land and Sea Council Aboriginal Corporation

Kalloora Bidiwah

Emu Plum Pathways

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Undalup Association Inc.

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A pathway to re-embed a Wadandi Bloodline as a conservation corridor in a socially and ecologically fragmented landscape

Our project centered on the integration of cultural knowledge systems into current and future land management. The project itself, and its outcomes, provide a practical, collaborative case study for a pathway to integrated land management.

This project progressed through a series of community workshops, field mapping with the Wadandi Cultural Conservation Corps, and integrated phylogeographic research; incorporated into the aim of re-embedding a Wadandi Bloodline as a conservation corridor.

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Wadandi cultural landscapes reflect ecological connectivity and biodiversity management

These landscapes integrate spiritual, social, and ecological networks, manifested in Bloodlines

Re-embedding Bloodlines into land management is imperative to reconnecting a fragmented landscape for social and ecological health

Wadandi country connectivity. Photo: Andy McGregor

We tell our stories, of our connection to country, and how the country works and how it all goes hand in hand

Emu Plum Pathways

Kalloora bidiwah describes a cultural corridor – *bidiwah* or pathway - reflecting aspects of a Bloodline related to the connection between Waitj (emu) and Kalloora (emu plum, *Podocarpus drouynianus*).

The Bloodline brings together ecosystems and associated species as part of a symbiotic network, manifest in cultural protocols, stories, and knowledge systems.

Uncle Wayne Wonitji Webb and *kalloora*

Kalloora fruit and waitj goona. Photo: Stephen Hopper

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Emu Plum Pathways

Kalloora, endemic to Wadandi country, are highly adapted to the fire-prone environments

After a burn, this plant produces large purple fruit, favoured by the emu, which disperses its large seed throughout the Jarrah-Marri forests in southwestern Australia

Culturally embedded maintenance of *kalloora*, encompasses practical (fire), spiritual (Songlines), and social realms (harvest)

Ripe *kalloora* fruit (purple) and seed

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Phylogeography

The study of plant genetics in a geographical context

Determines a species evolutionary history

Provides insight to the biogeographical factors contributing to genetic resilience and persistence

Patterns of genetic divergence illuminate aspects of species gene flow and adaptation to historical and contemporary influences

Kalloora in open Jarrah-Marri country

Bradbury *et al.*, 2019
Byrne, 2007
Mellick *et al.*, 2011

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Wadandi landscapes are understood as interconnected – places are managed as a collective within ecological systems

The landscape-level perspective considered in phylogeography offers an appropriate scale to consider long-term, broad patterns in species genetic health and adaptative traits – aligning with Wadandi management methods

Uniting the two provides an ideal foundation to inform a spectrum of conservation practices

Wooditjup Bilya. Photo: Andy McGregor

Mother nature, we need her. We gotta let her do her job.

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Project fieldwork

- Sampled across Wadandi Country
- Wadandi Cultural Conservation Corps
- WA Herbarium and Genetics Lab

These plants are our moort, our family

WCCC recording *kalloora*

WA Herbarium *kalloora* samples

Uncle Wayne holding DNA

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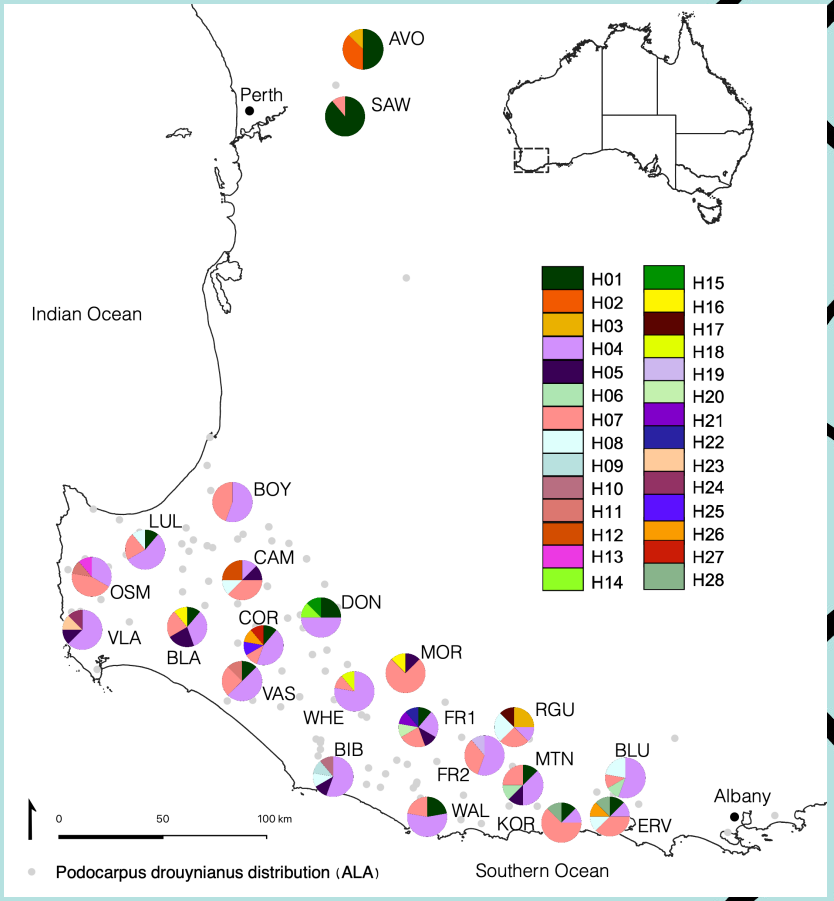
Genetics

Haplotypes are sequenced in the lab and analysed in a biogeographical context

The DNA demonstrates:

- Long-term persistence in the landscape
  - High intraspecific diversity
  - Gondwanan ancestry
- Reliance on long-distance seed dispersal
  - Homogeneity of diversity across distribution
  - Emus and *kalloora*
- Genetic health depends on landscape connectivity



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Cultural Corridors

The adaptive strength and vulnerability of *kalloora* lies in its dependence on long-distance seed dispersal through the landscape

Broken Songlines
- Habitat fragmentation
- Disruption of emu movements
- Altered land management strategies

Critical need to integrate methodologies under Wadandi leadership and guidance

DNA is a bridge between two knowledge systems

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Wadandi Bloodlines

Wadandi have a sustained interaction with this landscape and its evolving biome for millennia of generations

The imperative is acknowledging and recognizing these complex, transgenerational knowledge systems

Healthy biomes, healthy people

Key to *kalloora* genetic viability is landscape connectivity - Wadandi Bloodlines

Guilfoyle *et al.*, 2015
Wehi *et al.*, 2017

References

- Bradbury, D., Binks, R. M., Coates, D. J., & Byrne, M. (2019). Conservation genomics of range disjunction in a global biodiversity hotspot: A case study of Banksia biterax (Proteaceae) in southwestern Australia. *Biological Journal of the Linnean Society*, 127(2), 390–406. https://doi.org/10.1093/biolinnean/blz050
- Byrne, M. (2007). Phylogeography provides an evolutionary context for the conservation of a diverse and ancient flora. *Australian Journal of Botany*, *55*(3), 316–325. https://doi.org/10.1071/BT06072
- Guilfoyle D. R., Mitchell M. B. & Webb W. (2015) Identity and culturally defined methods of adaptation amongst the Wadandi people of southwestern Australia. In *Identity and Heritage* (pp. 85-96). Springer, Cham.
- Mellick, R., Lowe, A., & Rossetto, M. (2011). Consequences of long- and short-term fragmentation on the genetic diversity and differentiation of a late successional rainforest conifer. *Australian Journal of Botany*, 59(4), 351–362. https://doi.org/10.1071/BT10291
- Wehi, P. M., & Lord, J. M. (2017). Importance of including cultural practices in ecological restoration. *Conservation biology*, *31*(5), 1109-1118.

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