

Prospecting for earth rings on Wurundjeri Woi-wurrung Country, Victoria using airborne LiDAR

AUTHORS AND AFFILIATIONS

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INTRODUCTION

Archaeological sites with potential ceremonial associations can help Traditional Custodians to reconnect with places that were once lost due to European invasion, and to learn more about their past. Moreover, the need to identify and conserve these places and their broader cultural landscapes is critical in increasingly urbanised environments. On Wurundjeri Woi-wurrung Country, Victoria (**Figure 1**), current knowledge about ceremonial sites is centred on the archaeological evidence from five earth rings in Sunbury. This study investigates the potential for identifying similar earth rings elsewhere on Wurundjeri Woi-wurrung Country through archaeological remote sensing.



Figure 1 Wurundjeri Woi-wurrung Country, Victoria



Do more earth rings exist along the **biik wurrdha (Jacksons Creek)** corridor or elsewhere on **Wurundjeri Woi-wurrung Country**? If so, what are the implications for our **broader understanding** of earth rings and their distribution and how they are **protected and cared for**?



Figure 2 Reservoir Road 1 (VAHR 7822-0492) circa 1991. Image courtesy of David Frankel

THE SUNBURY EARTH RINGS



- Located in Sunbury and along **biik wurrdha (Jacksons Creek)**, and of great significance to the Wurundjeri Woi-wurrung people
- First published about by Frankel (1982)
- Circular, ephemeral earth features with slightly raised edges, between 15-25 metres in diameter (**Figure 2**)
- Assessed as being of Aboriginal cultural origin during excavation of Sunbury Ring G (Frankel 1982:95–96)
- Share some similarities to the Aboriginal bora rings of New South Wales and Queensland, which are understood to have ceremonial and social functions (Bashta 2016:100)

METHODS

High-resolution (1m and 30cm/pixel) airborne LiDAR-derived digital elevation models (DEMs) of Greater Melbourne were processed with the Visualization of Archaeological Topography (VAT) relief visualisation technique by Kokalj & Somrak (2019) and used to systematically and visually prospect for potential earth rings on Wurundjeri Woi-wurrung Country over two phases in QGIS.

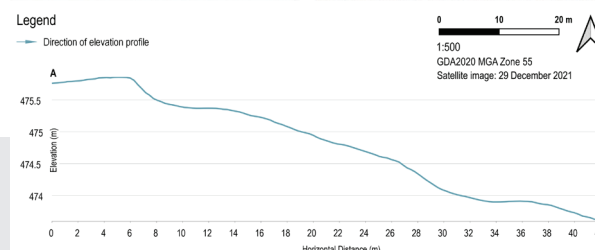
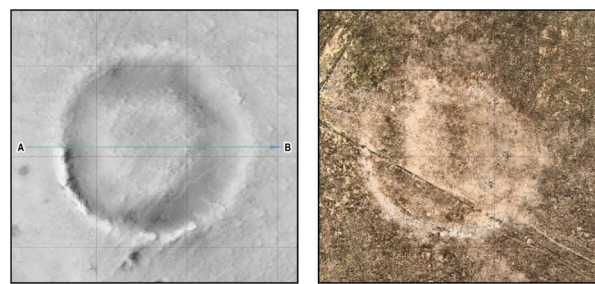


Figure 3 A potential earth ring feature – detailed orthographic view (VAT [30cm/pixel resolution] and satellite image [Nearmap 2023]), and elevation profile

RESULTS

In an Australian archaeology first, **28 potential Aboriginal earth ring features** were identified across various landforms and environments on Wurundjeri Woi-wurrung Country using LiDAR DEMs with VAT. Most share characteristics with previously recorded rings – a signature circular structure with a cleared centre and raised edges (**Figure 3**). Eight features were determined to be highly likely of Aboriginal cultural origin, based on predefined criteria. Twelve were rated of medium likelihood, and the remainder of low likelihood. It is acknowledged that some features may have been missed during prospection, or some may be of European origin. Additional non-invasive archaeological investigation of these features will further refine these results.

CONCLUSIONS

Potential earth ring features appear to be distributed on Wurundjeri Woi-wurrung Country more broadly than previously thought, highlighting the need to consider these, and all Aboriginal places, as components of a cultural landscape synonymous with the concept of Country. This data contributes to the Wurundjeri Woi-wurrung peoples' understanding of their past, present and future. Furthermore, these methods could be used in other parts of Australia to identify ephemeral earth features, and possibly on bora rings and bora grounds. Next steps include collaborating with the Wurundjeri Woi-wurrung Heritage Unit Elders to publish and expand on this research.