

# Excavations, Surveys and Heritage Management in Victoria

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*Edited by*

Deb Kelly  
David Frankel  
Susan Lawrence  
Caroline Spry  
Elizabeth Foley

*with the assistance of*

Ilya Berelov  
Shaun Canning

*Front cover:*

*Participants at the zoom webinar panel discussion by Traditional Owners at the 2021 Colloquium. Top row: Darren Griffin, Liz Foley, Dave Wandin—Wurundjeri Woiwurrung; bottom row: Racquel Kerr—Dja Dja Wurrung, Tammy Gilson—Wadawurrung, Ben Muir—Wotjobaluk and Jardwadjali. (Screenshot by Caroline Spry)<sup>e</sup>*

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## Editorial note

The papers included in this 10th issue of *Excavations, Surveys and Heritage Management in Victoria* were presented at the annual Victorian Archaeology Colloquium held on-line via zoom webinar between 1 and 4 February 2021. This allowed even more than our usual number of people to register as participants, including some from interstate and overseas: their commitment and involvement testifies to the importance of this fixture within the local archaeological calendar. Many were fortunate to be able to meet in person, under appropriate protocols, for an outdoor boxed lunch at La Trobe University on 5 February.

We have taken the opportunity of celebrating our 10th anniversary by looking back over the last decade, both through a more formal analysis and through a less formal panel discussion of the history of the Colloquium and this publication. Another panel discussion transcript allows space for some Traditional Owners to reflect on particular examples that they feel have been of value in the complex process of cultural revival through a form of experimental (perhaps better experiential) archaeology.

The other papers published here deal with a variety of topics and approaches that span Victoria's Aboriginal and European past. While some papers report on the results of specific research projects others focus on aspects of method, approach, education and the social context of our work and approach. These all demonstrate how our Colloquium continues to be an important opportunity for consultants, academics, managers and Aboriginal community groups to share their common interests in the archaeology and heritage of Victoria.

In addition to the more developed papers, we have continued our practice of publishing the abstracts of other papers presented at the Colloquium, illustrated by a selection of the slides taken from the PowerPoint presentations prepared by participants. These demonstrate the range of work being carried out in Victoria, and we hope that many of these will also form the basis of more complete studies in the future. Previous volumes of *Excavations, Surveys and*

*Heritage Management in Victoria* are freely available through La Trobe University's institutional repository, Research Online <[www.arrow.latrobe.edu.au:8080/vital/access/manager/Repository/latrobe:41999](http://www.arrow.latrobe.edu.au:8080/vital/access/manager/Repository/latrobe:41999)> and through Open at La Trobe (OPAL) <<https://doi.org/10.26181/601a321a11c0d>>. We hope that this will encourage the dissemination of ideas and information in the broader community, both within Australia and internationally. We have also now set up a website for the Colloquium <<https://victorianarchaeologycolloquium.com>>

For the first time we have included an obituary to mark the passing of a member of our community: David Rhodes of Heritage Insight, a long-time supporter of our activities. Here we should also mention that we have also lost Ron Vanderwal who made important contributions to archaeology and the curation of heritage, although he was unable to participate in the Colloquia.

Once again we have been fortunate in the support given to the Colloquium by many sponsors: ACHM, Ochre Imprints, Heritage Insight, Biosis, ArchLink, Christine Williamson Heritage Consultants and Extent, while La Trobe University continued to provide facilities and a home for our activities, even if this year it was a virtual one. We would like to thank them, and all others involved for their generous contributions towards hosting both the event and this publication. Yafit Dahary of 12 Ovens was, as always, responsible for the catering, despite the limitations on her usual spread.

All papers were refereed by the editorial team. This year Deb Kelly managed this process and the sub-editing of this volume. Layout was again undertaken by David Frankel. Preparation of this volume was, like so much else in the last year, undertaken during the severe restrictions imposed because of the COVID-19 pandemic. We hope that 2022 will be a better year for all.

The presenters, editors and authors acknowledge the Traditional Owners of the lands and heritage discussed at the Colloquium and in this volume, and pay their respects to their Elders, past, present and emerging.

# Proximity of Aboriginal Cultural Heritage Places to fresh and salt water in the Bunurong Land Council Aboriginal Corporation Registered Aboriginal Party area: preliminary GIS analysis

David Tutchener<sup>1,2</sup> and Rebekah Kurpiel<sup>3</sup>

## Abstract

*This preliminary analysis assesses the proximity of Aboriginal Cultural Heritage Places to water within the Bunurong Land Council Aboriginal Corporation Registered Aboriginal Party area through the use of GIS analysis. This investigation draws on multiple datasets to demonstrate the proximity of recorded archaeological places to the nearest water sources, both fresh and salt. The proximity of freshwater sources to known Aboriginal Cultural Heritage Places has been previously calculated within the Melbourne metropolitan region by Canning (2003). He notes, that of 1005 Aboriginal Cultural Heritage Places, 79.4% are within 200 metres of a source of freshwater. The current investigation demonstrates that, of 3348 Aboriginal Cultural Heritage Places, 75.4% are within 300m of fresh waterways. The Aboriginal Heritage Regulations 2018 (Vic) specifies that areas of 'cultural heritage sensitivity' are within 200m of a named waterway and within 200m of the high waterline of the Victorian coastline. Consequently, the results of this preliminary analysis suggest that the definitions for legislated areas of 'cultural heritage sensitivity' in proximity to water sources need to be re-evaluated.*

## Introduction

Water is an essential resource and its influence on archaeological site distribution has been identified and/or used to inform site prediction models in numerous global contexts (e.g. Bell and Renouf 2004; Brandt et al 1992; Leathwick 2000; Niknami et al 2013; Nsanziyera et al 2018). Site prediction models are employed in the context of cultural heritage management primarily to assist in the identification of archaeological sites in advance of development activities.

In the State of Victoria, areas of legislated 'cultural

heritage sensitivity' (where Aboriginal Cultural Heritage Places [ACHPs] are considered most likely to be present) have been defined under the Aboriginal Heritage Regulations 2018 (the Regulations) that give effect to the Aboriginal Heritage Act 2006 (the Act). Under the Regulations, legislated areas of cultural heritage sensitivity are applied as part of determining whether an archaeological investigation will be required prior to development activity. A presence/absence approach to mapping Aboriginal cultural heritage sensitivity is an oversimplified method for representing the likelihood that people discarded cultural material, and thus created archaeological places, at particular localities. However, since areas of legislated cultural heritage sensitivity are the only areas of land within which archaeological investigation is mandated prior to development in Victoria, it is essential that these areas are designated on the basis of the most accurate and up to date data and methodological approaches available.

The Regulations set out multiple reasons for an area of land to be a legislated area of cultural heritage sensitivity. Those relating to water are:

- Regulation 26(1): a waterway or land within 200 metres of a waterway is an area of cultural heritage sensitivity.
- Regulation 27(1): a prior waterway or land within 200 metres of a prior waterway is an area of cultural heritage sensitivity.
- Regulation 28(1): an ancient lake or land within 200 metres of an ancient lake is an area of cultural heritage sensitivity.
- Regulation 29(1): a declared Ramsar wetland or land within 200 metres of a declared Ramsar wetland is an area of cultural heritage sensitivity.
- Regulation 31(1): land within 200 metres of the high-water mark of the coastal waters of Victoria or any sea within the limits of Victoria is an area of cultural heritage sensitivity.

The 200m proximity zone specified in the Regulations listed above was largely based on research undertaken by Canning (2003) and, to a lesser extent, Gaughwin (1981) and Sullivan (1981). Canning (2003:256) notes that access to potable water is considered one of the primary environmental factors affecting pre-colonial land-use

<sup>1</sup> College of Humanities and Social Sciences, Flinders University, GPO Box 2100, Adelaide, SA 5001. <david.tutchener@flinders.edu.au>

<sup>2</sup> Bunurong Land Council Aboriginal Corporation, 336-340 Nepean Highway Frankston. Vic. 3199.

<sup>3</sup> Department of Archaeology and History, La Trobe University, Melbourne, Vic. 3086.

decisions. In his analysis of ACHPs (using ArcView 3.2) within a subset of the Melbourne metropolitan area, Canning (2003:124) notes that of 1005 places:

- 62.2% are within 100 metres of a source of fresh water.
- 79.4% are within 200 metres of a source of fresh water.

Since Canning's research was completed, the commencement of the Act has increased the number and scope of archaeological investigations undertaken in the context of heritage management in Victoria, and the number of registered places has grown substantially as a result. Importantly, in 2003, Canning recognised the need to consider additional study areas to confirm whether similar patterns would be observable in other landscape contexts, which is a process this preliminary analysis seeks to begin. In the intervening years there have also been improvements to GPS accuracy and developments in GIS analysis. This paper presents the results of a preliminary GIS analysis of the spatial relationship between registered ACHPs and water on Bunurong Country. The results of this analysis and

further work in this area are likely to have important implications for cultural heritage management in Victoria.

### The Study Area

The current (April 2021) Bunurong Land Council Aboriginal Corporation (BLCAC) Registered Aboriginal Party (RAP) area extends from the south of Melbourne (Figure 1). The current RAP area incorporates Victoria's two largest islands, French Island and Phillip Island, and currently covers a total land area of approximately 5,438 km<sup>2</sup>. This administrative area does not necessarily represent the pre-colonial extent of Bunurong Country.

As of March 2020, within the BLCAC RAP area, there was a total of 3348 recorded ACHPs on the Victorian Aboriginal Heritage Register (VAHR) (Figure 1). Stone artefacts, represented by artefact scatters and low-density artefact distributions (LDADs), are the most common type of cultural material represented, followed by shell middens. It is crucial to note that when comparing the current study area to Canning's (2003) study area (see inset of Figure 1), the BLCAC RAP area

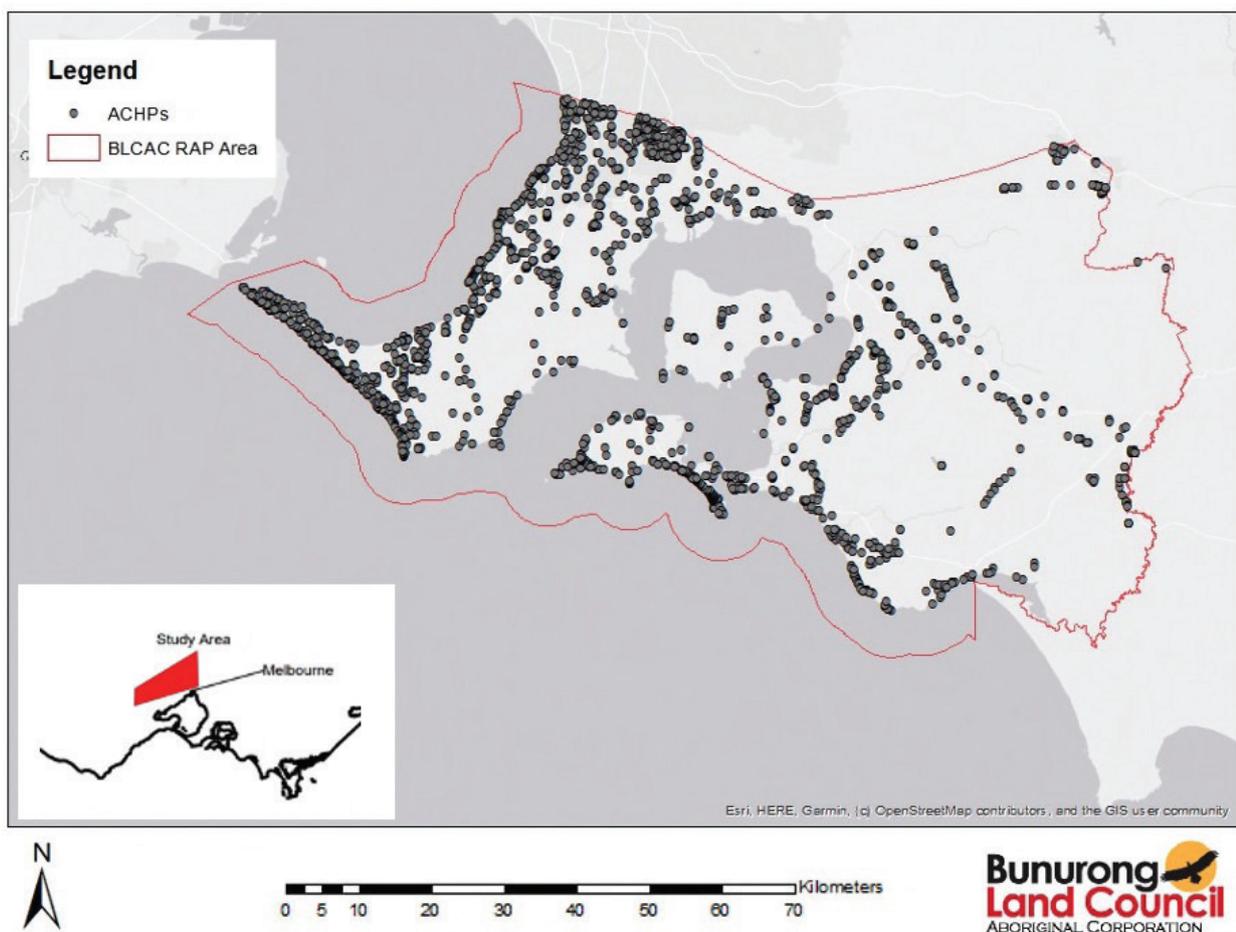


Figure 1. VAHR places within BLCAC RAP area (as of July 2021, this area has increased) (inset is Canning's 2003 study area)

Data Sets	Information
VAHR (Restricted Access)	The Victorian Aboriginal Heritage Register (VAHR) is a restricted-access register that contains all registered information about Aboriginal cultural heritage for the State of Victoria. For this study, the Primary Grid Coordinate (point data) for each registered Aboriginal Cultural Heritage Place was used.
Victorian Coastline 2008	Coastline of Victoria based primarily on zero metre (0m) contour dataset from the Vicmap Elevation Coastal DEM and Contours product derived using LiDAR and reviewing this dataset against the most recent and highest resolution aerial photography available in the DSE CIP image repository. ( <a href="https://services.land.vic.gov.au">https://services.land.vic.gov.au</a> )
Waterways	This layer is part of Vicmap Hydro and contains line features delineating hydrological features. Includes: Watercourses (i.e. channels, rivers & streams) & Connectors. ( <a href="https://services.land.vic.gov.au">https://services.land.vic.gov.au</a> )
Pre-1788 Wetlands	Polygons showing the extent of wetlands in Victoria prior to European settlement. Wetlands are classified into primary categories based on water regimes. The polygon boundaries were derived from digitizing marked up aerial photography interpretation. ( <a href="https://services.land.vic.gov.au">https://services.land.vic.gov.au</a> )
Cultural Heritage Sensitivity Mapping (public)	This version of the areas of the cultural heritage sensitivity dataset does not contain any attribute information. This dataset contains a spatial representation of “Areas of Cultural Heritage Sensitivity” as specified in Division 3, Part 2 of the Aboriginal Heritage Act 2006. ( <a href="https://services.land.vic.gov.au">https://services.land.vic.gov.au</a> )

Table 1. Data sets used in the GIS analysis

provides a useful contrast as it is significantly different in terms of landform and general composition and includes large tracts of coastal land.

## Methods

Multiple spatial datasets were employed in this preliminary analysis (Table 1).

The Near Table Tool in ArcGIS (ArcMap 10.4.1) allows for proximity to be measured between different feature classes or, in this case, water and ACHPs. Rather than simply measuring the proximity of all of one feature type to all of another feature type, which would be meaningless, this approach allows the distance between each ACHP and the nearest water to be measured. For example, if the proximity relationship between the red rectangles and the blue rectangles shown in Figure 2 was required, then measuring the proximity of all red rectangles to all blue rectangles would not (in this case) create any meaningful data. However, if the proximity of each blue rectangle is measured to the closest red rectangle, a more meaningful dataset is created (Tutchener 2018).

The initial feature class used was the VAHR dataset, which represents the primary grid co-ordinate for all the ACHPs in Bunurong Country (equivalent to the blue rectangles in Figure 2). The proximity of the VAHR feature class was then measured to the closest of the following water datasets: the coastline (as measured most recently in 2008), pre-1788 wetlands and any mapped (named or not) waterways (equivalent to the red rectangles in the example described above). The resulting data was then tabulated and a total average and

average distance per feature class calculated, as were the number of ACHPs within 100m, 200m, 300m and over 300m.

## Results

The results of the GIS analysis indicate that a spatial relationship between water and ACHPs exists within the BLCAC RAP area, and that this differs slightly depending on the category of water body (Table 2). On average, registered ACHPs within the BLCAC RAP area have the closest spatial relationship with wetlands, followed by the coastline and then other waterways (e.g. rivers and streams).

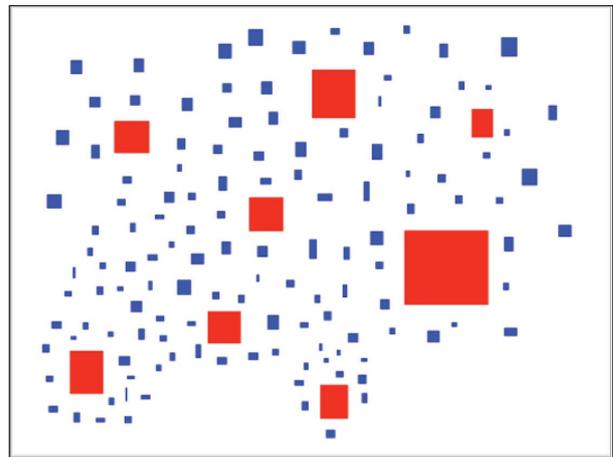


Figure 2. Image demonstrates the spatial relationship between two feature types (Tutchener 2018:Figure 60).

	Proximity to all water categories (m)		Proximity to pre-1788 wetlands (m)		Proximity to waterways (m)		Proximity to coastline (m)	
Mean	218.39		186.6		232.97		203.94	
Maximum	2407.83		2235.68		2407.83		2274.24	
Minimum	0		0		0.17		0.13	
	N	%	N	%	N	%	N	%
ACHPs within 100m	1392	41.6	221	53.3	645	33.7	526	51.6
ACHPs within 200m	2124	63.4	294	70.8	1094	57.2	736	72.2
ACHPs within 300m	2634	78.7	345	83.1	1444	75.4	845	82.9
ACHPs at a distance >300 m	714	21.3	70	16.9	470	24.6	174	17.1
Total ACHPs	3348	100	415	12.4	1914	57.2	1019	30.4

Table 2. Proximity of ACHPs to different categories of water resource determined by GIS analysis

### Discussion

This preliminary analysis demonstrates that there is a close spatial relationship between water and ACHPs that have been registered on the VAHR within the BLCAC RAP area, to the southeast of Melbourne. A similar relationship has been established previously by Canning (2003), to the north of the current study area, and water is also a well-established environmental factor for the prediction of occupation places within cultural landscapes.

The everyday use of water is an essential aspect of how Bunurong people produced their cultural landscape. This is clearly demonstrated in the proximity of archaeological places to water sources, both fresh and salt. For pre-colonial Bunurong people, much time was spent moving between camping locations, in order to exploit various resources and for social purposes (Foreman 2020). It is likely that Bunurong people were not simply moving through the landscape to only use the water at a water place, but also for customary reasons, social gatherings, the harvesting of various plants and the hunting of animals at certain times of the year. Many of these water places may have been seasonal camps used across time, perhaps for multiple generations. There does need to be a distinction made between the proximity to salt-water and fresh-water sources, as it is likely that these had distinct but overlapping functions. Fresh water is a necessity for life and can also provide

various plant and animal food resources. However, salt water, being undrinkable, has a more limited function, but was likely to have provided a greater range of food resources. However, future research may give further depth to this and other landscape-based variables.

Canning’s (2003:124) results are based on 1005 sites within the Melbourne metropolitan region and the current investigation had a larger dataset of 3348. Table 3 demonstrates the difference between Canning’s (2003) work and the present study in relation to the proximity of ACHPs to fresh water.

It is crucial to note that there are significant landscape differences between the two regions investigated as they are not evenly matched in terms of present-day triggers under the Regulations (i.e., there are more triggers in the present study area). There has also been a significant number of ACHPs added to the archaeological record since 2003, many of these recorded due to investigations prompted by the Act and mandatory CHMPs within 200m of named waterways, perhaps skewing the recent data. However, this bias would also suggest that the proportion of sites beyond 200m shown in the results of this preliminary analysis is highly likely to be an underestimation. The increase in total area of sensitivity is also something that should be considered, as there is a significant increase in km<sup>2</sup> between 200m and 300m from a water source, and further work may illustrate that the density of places within these areas potentially vary. It is also useful to note that the current study does not distinguish between named and unnamed waterways as the Regulations currently do, which likely provides a sounder understanding of archaeological sensitivity in relation to freshwater sources. These results demonstrate that the current 200m areas of cultural heritage sensitivity surrounding named waterways is not necessarily adequate to protect ACHPs within the BLCAC RAP area. Canning’s (2003) study area did not include coastal areas, but this study shows that a high

Distance to waterways (m)	Canning(2003) %	Current Study %
100	62.2	33.7
200	79.4	57.2
300		75.4

Table 3: Comparison of proximity analysis of fresh water to ACHPs

proportion of ACHPs (83%) are within 300m of the coastline within the BLCAC RAP area, while only 72% are within 200m.

There are, however, a number of limitations to the current data. For example, as the majority of these places were recorded during the cultural heritage management process it is likely that the data will contain a number of inaccuracies, for example, place types may not be identified correctly, and many older places have less accurate co-ordinates recorded. The data is simply collected during the process, and then the place is destroyed. It should also be noted that there are limitations to the VAHR dataset, as the spatial data for the burials are not included in order to protect these places, and the object collection category was included at this stage even though these are no longer in-situ places.

Crucially, this paper reports the results of a preliminary analysis, and further investigations will involve the analysis of the distribution of place types and their proximity to water sources with greater nuance. It is also probable that different Aboriginal groups used their Country in different ways and that state-wide models for 'cultural heritage sensitivity' will prove inadequate. The policy implications of the results presented here will be better understood following further exploration of the data.

## Conclusion

This investigation indicates that the vast majority of ACHPs within the BLCAC RAP area are within 300m of any water source. This preliminary analysis indicates that the current 200m buffer for cultural sensitivity may be inadequate. However, further GIS modelling work can refine what is outlined here, which is intended to be a broad and general study. It is essential that areas of cultural heritage sensitivity within the regulations are defined on the basis of the most accurate and up to date site prediction modelling possible, to limit the chances of Aboriginal cultural heritage being destroyed by development activities without being identified.

## Acknowledgments

We would like to thank and acknowledge the Bunurong community, Elders and BLCAC staff members. We would also like to thank all the industry and academic partners that we work with for their ongoing support for this and other projects. This project was partially funded through a related DEWLP project.

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