

Excavations, Surveys and Heritage Management in Victoria

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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)^e

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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> 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.

Collecting, storing and accessing archaeological science data produced during heritage management projects in the State of Victoria, southeast Australia

Rebekah Kurpiel¹

Abstract

The 'open science' movement is delivering a multitude of benefits with respect to sharing and developing knowledge in many disciplines, including archaeology. These days, most archaeological investigations in Victoria are undertaken in the context of heritage management, and specialist analyses are being incorporated into these investigations on a semi-regular basis. As the role of archaeological science in heritage management increases, it is important to consider appropriate approaches to collecting, storing and accessing the archaeological science data that are produced in this context. Heritage management projects do not readily lend themselves to 'open science' because some of the information generated can only be shared with permission, and/or is not suitable for sharing broadly. In cases where there are benefits for sharing information outside our industry, especially with respect to promoting the significance of important places to help protect them, we can work together with Traditional Owners and other stakeholders to ensure this is done appropriately. When sharing broadly is not appropriate, restricted-access registers, such as the Victorian Aboriginal Heritage Register (which holds information about known Aboriginal cultural heritage places and objects within Victoria), are a potential archaeological science data-storage solution, but we need to ensure that complete, correct, consistent and future-proof data are lodged so that today's research can be built upon by future projects.

These days, most archaeological investigations are undertaken in the context of cultural heritage management (also known as cultural resource management or compliance archaeology). Increasingly, heritage management projects are incorporating new research techniques and technologies to generate as much information as possible about the cultural material and landscapes under investigation. Significant amounts of archaeological science data are thus generated by heritage management projects and there is a need to ensure these data are collected and managed in the best way possible.

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Effective management of archaeological science data is important for several reasons. As a starting point, archaeologists have a responsibility to ensure their work is recorded in detail because archaeological excavation is a destructive process and the records produced may comprise the only information available subsequently about that cultural material and the context in which it was identified. Any records that are not published, or otherwise archived, will not be available to the communities, researchers and/or heritage management professionals who will need them in the future. Additionally, some areas of study (e.g. stone and ochre sourcing) involve building up reference datasets over long periods of time. Reference datasets resulting from and used in archaeological science investigations need to comprise complete and standardised data.

Ultimately, all the data collected in the course of heritage management projects, and all the funding that is supplied for specialist analyses, aim to contribute to an understanding of the past, so there is a need to synthesise information and address big-picture questions. Developing broad narratives on the basis of incomplete data is problematic and, even when the data exist, it is difficult to access and compile data stored in separate heritage management project reports, which are usually archived as PDF documents. As an example, Thomas et al. (2020) undertook a lengthy 'validation' process for radiocarbon age determinations in the State of Victoria, southeast Australia, and determined that nearly 40% of these determinations were accompanied by insufficient information to make an assessment of their reliability.

The principles of open science are relevant to determining suitable approaches for collecting, storing and accessing archaeological science data. However, there is a need to recognise the sensitive nature of some of the data that are generated, and to respect Indigenous Data Sovereignty (Walter et al. 2020). The regulatory frameworks that determine the processes for undertaking heritage management projects provide a means by which high-quality, consistent practices can be enforced. In Victoria, there are currently no processes in place to ensure that all archaeological science data are managed in a way that ensures their usefulness in the future. This paper explores some of the issues and possible pathways

for implementing better archaeological science data collection, storage and management practices in heritage management contexts, with a focus on Victoria.

The principles of open science

A systematic review of publications pertaining to open science has led to the following definition: “Open Science is transparent and accessible knowledge that is shared and developed through collaborative networks” (Vicente-Saez and Martinez-Fuentes 2018:428). The principles behind the ‘open science’ movement are that researchers should remain accountable and transparent by making all information about their research methods and results available to others. Making data available for other researchers to re-analyse, re-interpret and build on is a transparent and collaborative way of progressing science. The open science movement also seeks to address issues pertaining to information accessibility, aiming to ensure that research data are accessible to anyone with an interest, rather than restricting access via subscription or other payment arrangements.

To report research in accordance with the principles of open science, it is essential that all raw (i.e. unprocessed) data are provided. Historically, many publications provided only data that had been processed in some way and/or showed results only in summary form. More recently, there has been a trend towards providing supplementary information and/or links to data repositories, and this usually contains the full dataset associated with the results described in the main journal article. It is also necessary to report metadata (i.e. information about the data) so that readers are informed about how the data were collected. Metadata may include information like the type of equipment used to collect data, equipment settings that were used, and/or conditions under which data were collected. The information provided should be sufficiently detailed for another researcher to replicate the study.

Strictly speaking, aligning with the principles of open science also involves making data publicly accessible, but this is not always an appropriate course of action. For example, in Australia, data pertaining to Aboriginal cultural heritage is stored on restricted-access registers to ensure access to that information is only granted to specific people, preferably at the discretion of the relevant Traditional Owner community. Since some data are culturally sensitive and not suitable for sharing broadly, approaches to archaeological science data management must implement the principles of open science thoughtfully, and must respect both Indigenous Data Sovereignty (Walter et al. 2020) and the Australian Institute of Aboriginal and Torres Strait Islander Studies Code of Ethics for Aboriginal and Torres Strait Islander Research (2020).

Open science in Australian archaeology

The need for archaeological data management has long been recognised, and ongoing technological development has underpinned a number of initiatives globally (Davies 2020; Lake 2012; Marwick et al. 2017). In Australia, a repository for historical archaeology reports and images pertaining to sites in the State of New South Wales (NSW Archaeology Online; <<https://nswaol.library.usyd.edu.au/index.jsp?page=home>>) was established in 2009. The project, which was an initiative of the Archaeology of Sydney Research Group in collaboration with University of Sydney Library, aimed to provide open access to ‘grey literature’ reports and other resources, primarily from the 1960s–1990s (Gibbs and Colley 2012). Shortly after, the Federated Archaeological (or Field Acquired) Information Management Systems (FAIMS) project was set up for the purpose of improving efficiency and consistency for recording archaeological data in the field, and also to provide a digital repository for the data that were recorded using the FAIMS application (Ross et al. 2013). The datasets that were developed under the FAIMS initiative have since been migrated to an international archaeological data repository, known as the Digital Archaeological Record (tDAR; <<https://core.tdar.org/>>).

In Victoria, starting in 2012, Josara de Lange and colleagues came together to work on the Victorian Digital Archaeological Data Archive (DADA; De Lange 2013, 2014). One of the main issues this initiative sought to address was that some of the data recorded by heritage practitioners, particularly GIS spatial data and artefact analysis data, were not able to be accessed and used by other heritage practitioners because they were either not lodged or not accessible on heritage registers, leading to duplication of effort and, frequently, an incomplete understanding of previous research. The lack of accessible information was also limiting the extent to which the information from separate heritage investigations could be integrated to build up a meaningful picture of the past at a landscape scale, and this was something that De Lange and colleagues sought to address. Unfortunately, the proposed resource, which was a data archive that could be accessed by those who had contributed to it, was ultimately unable to be developed due to funding constraints.

Cultural heritage management and archaeological science in Victoria

In Victoria, Aboriginal cultural heritage is protected and managed under the *Aboriginal Heritage Act 2006* (Vic.) and subsequent amendments, and historical (including maritime) archaeological values are protected and managed under the *Heritage Act 2017* (Vic.) and subsequent amendments. Most archaeological

investigations undertaken in Victoria are completed as part of the statutory approval process for land development, where the legislation specifies a need for archaeological values to be assessed and an appropriate management plan established before a development activity is permitted to proceed. All archaeological investigations must comply with heritage legislation regardless of whether they are undertaken in a heritage management or pure research context.

Specialist analyses that fall under the banner of archaeological science are incorporated into heritage management projects on a semi-regular basis. Sometimes, specialist analyses are undertaken as part of cultural heritage assessments. An example of this is the use of Ground Penetrating Radar (GPR) to assist with determining the subsurface extent of an Aboriginal or historical archaeological site/place. More commonly, specialist analyses are undertaken during the implementation of management conditions that are outlined in an approved cultural heritage management plan or cultural heritage permit. An example of this is the application of specialist analyses to artefacts excavated during salvage programs. Although it is assumed that specialist reports are appended to each relevant heritage management report, this is not always the case, and the archaeological science data themselves appear to be submitted on rare occasions only. Since heritage legislation determines and enforces appropriate approaches to archaeological investigations in general, it also provides a mechanism for enforcing appropriate processes for managing archaeological science data specifically.

What are the challenges for implementing suitable approaches and how can they be addressed?

There are several challenges associated with implementing suitable approaches to the collection, storage and access of archaeological science data. Most of these challenges are experienced in a range of global contexts. A national approach to addressing this issue would be beneficial in Australia, because although each state and territory has its own set of heritage legislation and processes, a single set of guidelines could be implemented in ways that are appropriate to each jurisdiction. The discussion in this section centres on addressing the challenges in Victoria. The steps that may be involved in progressing these ideas are outlined in **Figure 1**.

Collecting data

An ongoing challenge for archaeological scientists in various areas of specialisation is the requirement for data-collection methods to be consistent between researchers so that results can be compared readily to findings from other studies. Generating consensus on how to approach

data collection can be problematic because it is common for there to be more than one valid perspective on how specific techniques are best applied. Consultation with a range of specialists to incorporate broad perspectives, and a requirement for data collection protocols to be recorded with the data (see below), would go some way towards addressing this issue.

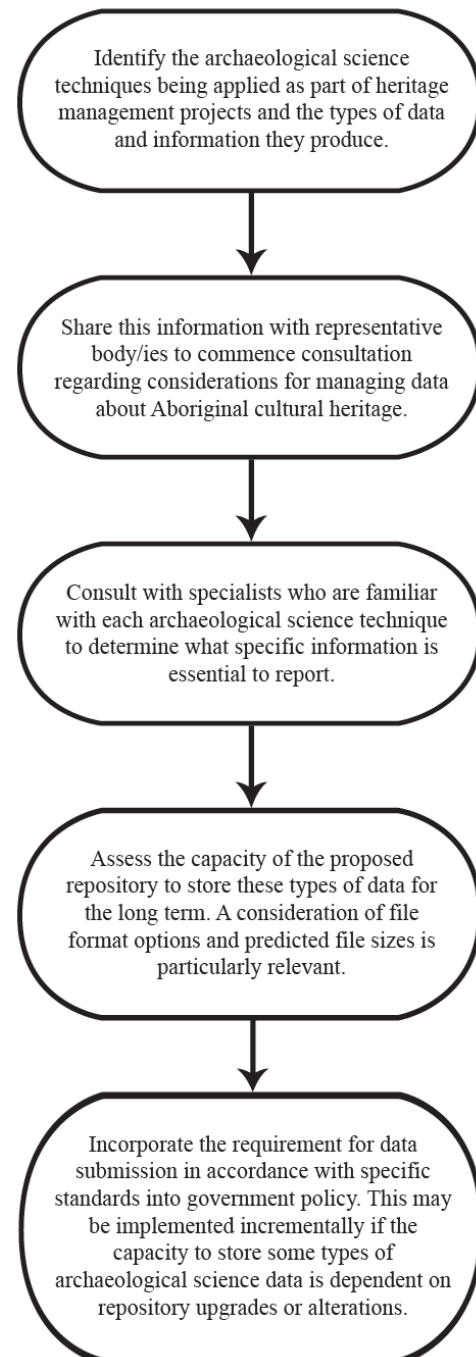


Figure 1. A flow chart outlining the steps that are expected to be necessary for addressing archaeological science data management needs for heritage management projects.

Keeping appropriately detailed fieldwork records is a critical aspect of archaeological science data collection. Interpreting the results of specialist analyses undertaken in the laboratory requires adequate information about the context in which samples and/or artefacts were identified. One of the challenges faced by the Victorian Radiocarbon Dating Visualisation Project was a lack of information about the archaeological context of dated samples, which prevented over one-quarter of the known radiocarbon age determinations from Aboriginal places in Victoria from being verified as relating to Aboriginal cultural heritage (many more were missing laboratory reports) (Kurpiel et al. 2021; Thomas et al. 2020).

Standards for reporting on archaeological places are already in place for both Aboriginal places and historical archaeological sites in Victoria. If specialist analyses are proposed, it may be necessary to record additional information in the field. The standards for this could be developed in consultation with specialists in the relevant techniques and implemented via a legislated requirement to submit specific information to the relevant heritage register/inventory (see below).

Storing data

There is a need for complete, unprocessed datasets to be archived/stored securely. Metadata must also be included so that data can be scrutinised, replicated and used in scientifically appropriate ways in the future. Metadata should provide information about how data were collected, including what specific equipment and equipment settings were used, testing conditions (if relevant) and sampling strategies employed (if relevant). Including specialist reports as appendices in heritage management project reports is insufficient because these do not always include the raw data and/or adequate metadata. It is also difficult to find and extract data from PDF documents even when data are presented in full.

To ensure that archaeological science data are useful in the future, it is necessary to store it in formats that are likely to be usable regardless of whether software becomes obsolete and/or is replaced by new versions. Some archaeological science data are created and used in proprietary formats, which presents a challenge for future compatibility. CSV and TXT file formats are unlikely to be associated with compatibility issues and are therefore good options for long-term data storage.

One of the challenges faced by the Victorian DADA team was that many heritage practitioners were not willing to be involved (De Lange, pers. comm. 2021). Presumably, objections related to the need to invest staff time in preparing datasets for submission, and potentially also concerns about sharing information with competitors. Issues with participation can be addressed by mandating the requirement to submit archaeological science data at the completion of each heritage

management project in a specified format. Other types of project data (e.g. spatial data for test pit locations) are required to be submitted in specific formats, along with a data summary table, and this could be expanded to include archaeological science data.

Digital data archives require ongoing maintenance, which needs resourcing. A number of existing digital repositories (e.g. tDAR) are resourced via a user-pays arrangement, where the person or institution depositing the data pays a fee for doing so. This is a viable way of approaching this challenge, especially if researchers are obliged to archive data (e.g. funding provided is contingent on this occurring), and are building these fees into their project budgets. One way to reduce the impact of resourcing problems is to plug into an existing data repository, which is likely to be possible in Victoria (see below). This may not eliminate resourcing issues entirely, because the existing heritage data repositories do not run themselves, but it would be a much more efficient way of resourcing a repository than developing and maintaining new platforms. Free online data repositories are also available. These may be resourced by selling advertising space on websites, an allocation of public money, crowd funding, volunteer labour, or via other means. There are also university-based repositories, which are typically available to academic researchers at no cost because they are resourced by the institution. Prior to selecting a repository, the functionality and features associated with different options, and the terms and conditions of repository use, should be assessed to ensure they are a suitable storage solution for the data in question.

Accessing and sharing data

Some of the data produced during heritage management projects are culturally sensitive and not suitable for sharing widely (e.g. data pertaining to Aboriginal cultural heritage). In Victoria, a restricted-access register, called the Victorian Aboriginal Heritage Register (VAHR), holds this information. Historical archaeological data are held on the Victorian Heritage Inventory (VHI), which is accessible to the public under Section 121 of the *Heritage Act 2017*. However, the information held on the VHI is not considered to be culturally sensitive.

To maintain appropriate restrictions, it makes sense for archaeological science data to be accessed in the same way as other data pertaining to cultural heritage. Any use of data that are accessed via these registers/inventories must align with legislative requirements and consider stakeholder requirements. In the case of Aboriginal cultural heritage, data must be used only in ways that have been expressly permitted by the relevant Traditional Owner group/s. Indigenous Data Sovereignty and the AIATSIS Code of Ethics must be respected, which may mean that government-controlled heritage registers are not always a suitable choice. Publication of archaeological

science data pertaining to Aboriginal cultural heritage should occur in collaboration with Traditional Owners; co-authorship can help to ensure that the information being published is suitable for the public domain.

Conclusion

Most archaeological investigations in Australia are undertaken in the context of heritage management and it is essential that data generated by these projects are collected, stored and accessed appropriately. In Victoria, there is substantial opportunity for improving archaeological science data management because there are currently no mandated processes in place for much of the data that are produced. The VAHR and VHI are existing data repositories on which it may be possible to store archaeological science data generated by specialist analyses, which are becoming an increasingly common component of heritage management projects. Making use of existing repositories would forego the need to develop and maintain a separate repository for storing archaeological science data, and would ensure that culturally sensitive data are subject to restricted-access protocols, but it is essential that Indigenous Data Sovereignty and the AIATSIS Code of Ethics are respected. In terms of practicality, there may be a need to implement policy incrementally, commencing with types of archaeological science data that can be stored on these repositories without the need for repository upgrades, and working towards policy to cover those that require repository upgrades as a longer-term agenda.

Acknowledgments

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