A Grave Responsibility to Honour Our Ancestors:

A National Guide for Aboriginal and Torres Strait Islander Communities to Identify and Protect Unmarked Graves and Cemeteries.

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About the Artist

My name is Chris Wajung Gray and I am proud Goori Man from Bundjalung Nation.

My journey as an artists started a few years ago living on Wulgurukaba Country where I started my connection with art and how I can tell a story. As I developed my skill and learning from other artists, I found a true love with my art. I had found this to be very therapeutic after leaving the Army as I was trying to find my way after many years with the Defence Force.

Once I began to paint and learn my craft of dot art, I really wanted to challenge myself in doing custom art for people and this is where my journey really begins. I found a way to connect with people all over the country and learn each other's journey in life. Making these connections with people is how I develop a lifelong piece of art which has a significant meaning to the person and their families. Every single piece I have done provides me with deeper understanding about art and how the piece tells a story.

This art piece that I have provided for this book tells a story of connection. The 5 circles that are in the middle represents the resting place for our people that have returned back to the land. The bigger circles with the connection of white dots represent the connection between tribes and that they travel from over country to country.

Thank you

Foreword

Under the NSW Aboriginal Land Rights Act, Tweed Byron LALC have responsibilities and a statutory role to: (a) Take action to protect the culture and heritage of Aboriginal persons in the council's area, subject to any other law; and (b) Promote awareness in the community of the culture and heritage of Aboriginal persons in the council's area.

Preceding this statutory function is our Lore, our Cultural Responsibility to protect Country and the sacred resting places of our ancestors. We have strict instructions by our old people, those who are gone and those still with us to continue this very important work, keeping in line with Cultural Protocols.

Tweed Byron LALC along with our other local Goori organisations (TSC – Aboriginal Advisory Committee) worked in partnership with Tweed Shire Council to create the Aboriginal Cultural Heritage Management Plan which was adopted in 2018. The ACHMP is a tool which is utilised to further strengthen local Council protocols in protecting Culture and Heritage within the Shire and now the Tweed Byron LALC have the Cultural Heritage Unit (CHU) which further identifies and registers sites such as burial sites.

This Toolkit is an extension to the ACHMP plan and a culmination of work carried out by our Senior Sites Officers and CHU Staff, and inspired by conversations and cultural exchange with Aunty Maria Pitt, Aunty Dianne Nicholls-Pitt and Jason Jia from the Mapoon Community. In these conversations we discussed how we could jointly create a document and a tool to strengthen the work our communities do every day and share with other Aboriginal communities in helping them protect the resting places of their ancestors.

We are under no illusion that we can do this alone, given the changed landscape of this continent after Invasion & Colonisation, we have western laws and different land tenures that at times impedes us carrying out our Cultural Lore to protect these resting places/burial grounds/massacre sites. We have learned from some of the best practitioners in the westernised Cultural Heritage space and combined their knowledge and experience with our knowledge holders and Lore men and women chosen by our old people to carry out this important work in this time and in this space.

We hope this toolkit is something that other communities feel they can utilise to help them in their journey to protect and honour their ancestors in their final resting places on Country.

Uncle Des Williams
Chairperson and Senior Cultural Sites Officer
Tweed-Byron LALC
and
Leweena Williams
CEO, Tweed-Byron LALC
Tweed Heads, NSW
26 September 2021

Firstly, I pay my respect to all Aboriginal people and honour our Elders, past, present and emerging. The resting places of many of our ancestors who were buried in Mission times and pre-Mission times have been lost. Mostly due to poor record keeping and missionaries denying cultural practices to be continued. They need to be found and the sites protected. The Mapoon community, with the support of the Mapoon Aboriginal Shire Council, recently went through a process of locating and identifying gravesites, not only in our old cemeteries, but also in remote areas, with many being buried before European Invasion. This took place after extensive consultation with community, with significant input from Elders. We could not do this on our own, so we sought the services of professionals who had the knowledge and tools, and together we developed a process which started with a Scope of Works and ended with a Cultural Heritage Management Plan document for long term protection and management of our gravesites. During the project, we located over 1,000 grave sites using local labour. What a great outcome. The process we used is identical to that outlined in this National Guide for Aboriginal and Torres Strait Communities to Identify and Protect Unmarked Graves and Cemeteries. Therefore, I have no hesitation in recommending this National Guide, for it is a great tool to use in our desire to locate and protect our lost ancestors. I hope by sharing our knowledge and journey we can help other communities look after the resting places of their old people.

With respect,

Peter Guivarra
Former Mayor and Deputy Mayor
Mapoon Aboriginal Shire Council
Mapoon, Cape York Queensland
7th September 2021

Our ancestors were amazing land managers, they knew how to care for country, what seasons to hunt certain animals and when to burn. Our ancestors left this country to us, and it is our responsibility to care for it and protect it just as they did, so that the next generation knows how it feels to walk on country and to see its beauty. When we walk on country we are walking with our ancestors. Protecting their resting places is not just about protecting their graves, it is about protecting our country because our heritage, our history and our cultural values are all connected to it. The land, the sea, the animals, the plants, the people and our cultural sites are all connected. Our country is everything to us, just as it was to our ancestors. As Traditional Owners it is our responsibility to save our country, but we need to use the right approach to protect the lands and ecosystems that are under threat from climate change and development. We can see how quickly our country is being impacted. Every year, every day, we lose more land to sea level rise and big tides. Our sites are eroding into the sea. Our seasons are changing. Our turtles have to travel further and further inland to safely lay their eggs. We can feel the land suffering. We must use our knowledge, the knowledge of specialists, and the scientific data to monitor these changes and to put practices in place to protect our country. Part of that process is bringing awareness of these problems, especially within our own communities, to educate our people and to show them how to care for country, and the resting places of our ancestors. This document is a first step, and we want to share this with communities everywhere. Now we need to pull together to take care of our land, and to keep our history alive, because the country is what gives us our identity, and the ability to take care of our country is within us. Now is the time.

Aunty Maria Pitt and Aunty Diane Nicholls-Pitt
Tjungundji Traditional Owners
Mapoon, Cape York, Queensland
7 September 2021

Aunty Maria Pitt

Aunty Diane Nicholls-Pitt

Preface

This guide was developed for, and with, Aboriginal and Torres Strait Islander communities to address the national issue of lost and desecrated graves and resting places of their ancestors and families, the deep hurt that comes from these losses, and the solemn responsibility communities have to find and protect these final resting places.

This guide is for all those Aboriginal and Torres Strait Islander communities and individuals who have seen the vital and increasingly urgent need to identify and protect the lost and unmarked graves of their families and ancestors.

Devastatingly, after the European invasion many of these final resting places were destroyed, knowledge of their location lost or not recorded, and access to them denied due to the new land tenure restrictions. Historically Aboriginal and Torres Strait Islander cemeteries were not recognised or recorded until 1967, and institutional racism means that government funding and support for proper management has not been made available in the same way it has for other public cemeteries. With increasing land use and abuse, and the impacts of climate change, we are seeing more and more communities reaching out for help to protect at risk burials, graves and cemeteries.

The importance of finding and protecting these resting places has been re-told over and again by Aboriginal and Torres Strait Islander communities throughout Australia. This resource is a direct result of listening to these concerns and collaborating with communities and specialists. The information compiled here aims to provide a useful guide to finding and protecting unmarked graves and is derived from the lessons we have learned from our experiences working with communities in Cape York Peninsula, Queensland and Northern Coastal New South Wales. However, the methods, resources, case studies and advice provided here aims to help communities nationally. The importance of sharing concerns and advice within the national Indigenous community has never been more critical.

This guide is broken into chapters which address the different steps in identifying and managing unmarked graves. The importance of Indigenous leadership, knowledge and history is always at the forefront of this publication.

Chapter 1 provides information and resources on how to conduct oral his-

tory and archival research for locating marked and unmarked graves. It includes tips on researching online and a list of archival sources to investigate depending on your state.
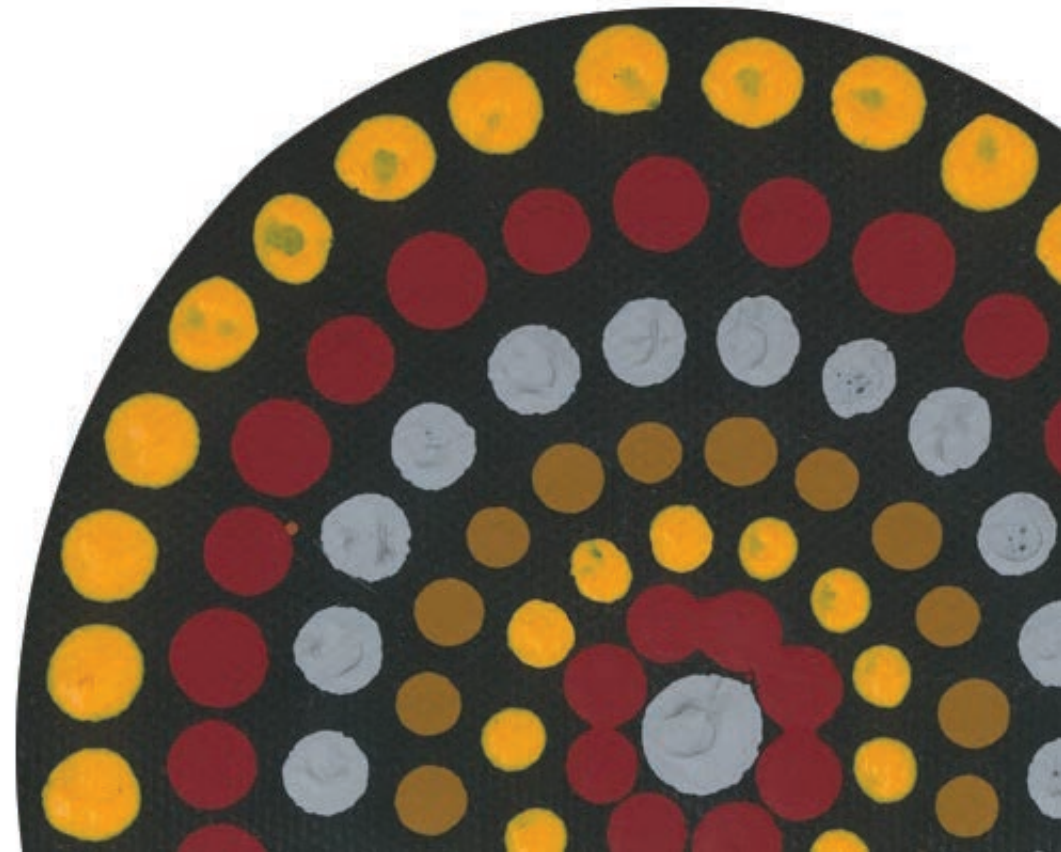
Chapter 2 examines the role of archaeology, geomorphology and pedology (soil science) provides in assisting the identification of lost graves and burial sites. It includes an explanation of different burial practices and what the remaining evidence of these might look like in the archaeological record. It also includes a discussion of the types of landscapes and soils that burials are likely to be found in and how to identify them, and what influence these different environments have on the preservation of burials. This section also includes useful links to mapping resources.

Chapter 3 provides a clear description of some of the types of non-invasive scientific tools that can be used to identify unmarked graves, with a focus on ground-penetrating radar (GPR). This chapter provides brief descriptions of how the methods work, what kind of information they can provide, and an explanation of their limitations.

Chapter 4 presents key information for the management and protection of unmarked graves including the importance of context, understanding the responsibilities of land tenure, assessing the risks to graves, and identifying local culturally appropriate ways to manage graves and protect them in the future.

Appendices attached to this document include a list of the relevant Commonwealth and State legislation relating to heritage, the treatment of human remains and cemeteries, as well as links to useful contacts, funding sources and an example of an inspection checklist for grave sites and protocols for finding graves.

We hope that this document provides Aboriginal and Torres Strait Islander communities across Australia with enough information to begin the process of identifying and caring for the resting places of their ancestors and families and promotes the importance of community leadership in these endeavours.

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Do you know where a cemetery, burial ground or grave is located, or do you want to find out?

2

Historical Research and Oral History Interviews
Chapter 1

3

Archaeology and Geomorphology Research
Chapter 2

4

Non-invasive and Geophysical Surveys
Chapter 3

5

Develop a Management Plan and Seek Assistance
Chapter 4, Appendices B, C, D, E and F

The exact location of resting places may be known
or
a general location only known from memories and stories

Step 2 can provide more information such as names and locations of individuals, or extent of cemetery boundaries, or narrow down the location of unmarked graves

Step 3 can help to assess the condition, boundaries and features of the burial sites as well as the suitability for further investigation

Step 4 can help to identify the location, extent and possibly condition of burials where no surface evidence remains

What are the key threats and risks? How do we manage these threats and risks? Who can assist in Government? Where can we find funding?

A Step by Step Guide for

Identifying and Protecting Unmarked Graves

CHAPTER ONE

ORAL HISTORY AND ARCHIVAL RESEARCH

Finding out about the final resting places of families and ancestors

One of the biggest challenges faced by Aboriginal and Torres Strait Islander families across Australia, is the lack of formal records about cemeteries that contain their old people as well as unmarked graves including massacre sites and traditional burial grounds. This absence of formal records and gazettal of Aboriginal and Torres Strait Islander cemeteries prior to 1967 is due to historical and institutional racism. Before the 1967 referendum, Aboriginal and Torres Strait Islander people were not recognised under the Constitution, so that like all other Australians, they would be counted as part of the population[1]. Therefore, this lack of recognition, of not being counted in life, also extended to not being counted in death, as the Commonwealth and States predominantly before 1967 did not formally record or manage burials, unmarked graves or cemeteries.

This chapter aims to answer common questions that Aboriginal and Torres Strait Islander individuals and communities may have when attempting to identify and protect the resting places of their families and old people, including:

- What resources exist to assist Aboriginal and Torres Strait Islander individuals and communities to research the final resting places of their families and ancestors, and how old people looked after their ancestors?
- What are the main archives and databases to assist Aboriginal and Torres Strait Islander families with identifying cemetery and unmarked grave records?
- What are some tips to assist with piecing together the names of the old people for naming grave markers or tombstones?

- What are some tips for Aboriginal and Torres Strait Islander families to assist in recording the oral history of their Elders?

Tjungundji Elder and Chief, Mamoose (centre of the photograph), performing a traditional dance at Cullen Point, near the former Mapoon Mission Cemetery site. Mamoose's grandchildren (Aunty Diane and Aunty Maria) and Traditional Owners continue to care for country and were involved in the cemetery and burial investigations at Mapoon, QLD. (Source: Norman F. Nelson Collection, Fryer Library, University of Queensland, 1937).

Resources for Research

Post-contact cemeteries (formal burial grounds, many with grave markers) were associated with Christian traditions and missionaries. In Australia, missionary records (including collections of photographs and plans, and sometimes old films, Births, Deaths and Marriage Books, Annual reports, correspondence files and diaries) as well as Aboriginal Protectorate Board/State records (particularly Social History Cards) from reserves and stations are the key records for finding these places. Death notices, funeral notices, obituaries, and in memoriam notices published in newspapers, and wills and probate records may also be found through tools such as online search engines and collections of newspapers on websites such as Trove, or in old missionary records or State archives.

Traditional burial grounds and unmarked graves (including burial mounds or middens) are also not formally recorded or mapped due to the great antiquity of Aboriginal and Torres Strait Islander communities. Historical photographs, early explorer and ethnographer records, surveyor's sketch books, portion plans, parish maps and personal journals or diaries are some of the critical records that may document such places.

Missionary records as outlined above for Cemeteries may also record mention of these burial grounds and areas of unmarked graves (such as burial mounds or middens). Middens were often used for multiple purposes including interring human remains and cremations. As the Protectors and missionaries and agents of the State at reserves, were enforcing legislation to stop Aboriginal and Torres Strait Islander communities practising their cultural traditions, including mortuary practices, historical photographs may often have the details of burial mounds or middens in the background of photographs and landscapes. Traditional burial practices and unmarked graves may not be 'officially' documented as this would have indicated in reports to their superiors that they were failing at missionizing or enforcing State control to change cultural practices.

Massacre sites are also not usually formally documented, as they are often hidden histories, places of deep trauma for Aboriginal and Torres Strait Islander communities, and secrets sometimes held by perpetrators and their families. This information may be passed down through generations in stories and oral tradition. If a massacre were perpetrated and publicly well-known and the perpetrators trialled, then historical court documents and newspapers on Trove would be important places to locate this information.

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MYALL CREEK MASSACRE

The Myall Creek massacre memorial.

https://blakandblack.com/2013/06/04/myall-creek-an-unlikely-symbol-of-reconciliation/

The general locality of massacre sites may be known but as the actual event was usually dispersed over a wide area, specific locations may be much more difficult to identify. Further we generally have very little information about what happened to the dead after the event and in some cases there may not even have been any burials. In the case of the Myall Creek massacre in NSW (1838), it is known that the perpetrators attempted to dispose of the evidence by fire. Despite the intensity of such a fire this action will have left an archaeological trace that could potentially be identified in the soil. At Myall Creek today, a commemorative ceremony is held annually and a substantial memorial was erected in 2000, upgraded in 2021, and approval has been obtained for construction of a cultural facility at that site.

Memorialisation of Aboriginal sites in this way is not always consistent with Aboriginal values but it can be an important form of reconciliation and education. It can also serve to raise awareness of the reality of Aboriginal history in the broader Australian community. These values suggest that memorialisation of important events and sites that can be shared should be given consideration. The biggest difficulty is funding. There is no reason why Aboriginal and Torres Strait Islander communities should have to bear the costs of such developments.

Main Archives and Databases

There are several key archives nationally that have records which can assist with identifying cemetery and unmarked grave records:

Trove is an online database administered by the National Library of Australia that contains hundreds of thousands of records from collections from Australian libraries, universities, museums, galleries and archives. It is free and available online all day, every day using the internet, at the following link https://trove.nla.gov.au/. Trove includes very, old historical photographs, plans, books, newspaper articles, oral histories, films and audio that can be searched by keyword. Trove may also have death notices within it or old newspapers which can assist with the location of where someone is buried, not just whom they are. Trove is a great first step when you start researching as you can find many things quickly without cost and download them to your computer or phone to read without stepping foot outside your home. Keywords in Trove results can be used to follow up in other sources.

AIATSIS (Australian Institute of Aboriginal and Torres Strait Islander Studies) is the national institute, based in Canberra, ACT, which focuses on the promotion and preservation of Aboriginal and Torres Strait Islander cultures. The institute contains numerous records and collections of oral histories of Elders and families, community studies, photographs and cultural information. The Mura Catalogue is a search engine within the AIATSIS web site used to find relevant research materials. https://aiatsis.gov.au/collection/search-collection

The AIATSIS Family History Unit can help people researching their Indigenous family history. The AIATSIS Finding Your Family website is an online resource with a focus on helping people to learn how to do Indigenous family history research. The Aboriginal and Torres Strait Islander Biographical Index enables you to do an online name search of some of the material in the collection. https://aiatsis.gov.au/family-history/where-get-help/new-south-wales. AIATSIS also provide many search guides and resources for research, including a family history research tool kit https://aiatsis.gov.au/sites/default/files/2021-02/aiatsis-family-history-kit-feb-2021.pdf

Link-Up services are geographically based by State and Territory (although there is no Link-Up in Tasmania or the ACT) and assist Aboriginal and Torres Strait Islander people of the Stolen Generations (those who were fostered, adopted or raised in institutions under government policies of the time). Link-Up helps members of the Stolen Generations trace their families and be reunited with them (or their gravesites, country or kin). In Tasmania, **Find and Connect** can help in tracing stolen generations through orphanages and other homes.

National Archives of Australia contain Commonwealth records as well as donated collections of records. There are equivalent archive services in each State and Territory. The online search feature which includes photographs and historical manuscripts, is accessible online https://recordsearch.naa.gov.au/SearchNRetrieve/Interface/SearchScreens/BasicSearch.aspx

National Library of Australia has records and archives of national significance. It holds books, manuscripts, newspapers, photographs and oral his-

tories that could be useful in researching cemeteries and family history. Some of these resources, such as photographs and newspapers, can be viewed online via Trove. Other material, such as some oral histories can be accessed via the Library website or within their family history collection www.nla.gov.au/research-guides/family-history and www.nla.gov.au/what-we-collect/indigenous

There is a detailed guide of resources on Aboriginal and Torres Strait Islander communities within the NLA called Mura Gardi, which provides details of manuscripts, photographs, plans and oral histories.

https://webarchive.nla.gov.au/awa/20120609104232/http://pandora.nla.gov.au/pan/134560/20120609-0000/www.nla.gov.au/muragadi/introduction.html

Each State also has a main State library collecting records pertaining to that State and several Universities have specialised in acquiring more local material. Often this is duplicate material to that held by the National Library, but it can also include primary sources not held elsewhere. Examples are:

The State Library of New South Wales (Including the Mitchell Library) https://www.sl.nsw.gov.au

The Noel Butlin Archives Centre at the Australian National University https://archives.anu.edu.au/collections/noel-butlin-archives-centre

The University of Newcastle operates a database of historical materials relating to the Aborigines of the Newcastle – Lake Macquarie region. https://downloads.newcastle.edu.au/library/cultural%20collections/awaba/history/index.html

Further details are also provided in the table below.

Australian War Memorial has military records on Aboriginal and Torres Strait Islander people who served in every military conflict that Australia has been involved in since the Boer War (1899–1902). Military records are a rich source of information about the men and women who served in the armed forces and this information can assist with memorials and tombstones for unmarked graves within communities. These records and a guide to researching Aboriginal and Torres Strait Islander members of the defence force can be found at the following links:

https://www.awm.gov.au/articles/indigenous-service/researching

https://www.awm.gov.au/articles/encyclopedia/indigenous

https://www.awm.gov.au/collection/understanding-the-memorials-collectio…

Other archives and sources

Each State and Territory also has a government agency (see Appendix B) which administers heritage within their jurisdiction. These agencies have databases and libraries which contain information on Aboriginal burial sites, cemeteries and traditional burial grounds, as well as massacre sites. These databases are not complete and are sometime inaccurate, but they also provide reports, site cards and heritage listings that can assist with research.

The table here provides a summary of the key archives by each State and Territory and the kinds of records within these archives that may assist with research on unmarked graves, massacre sites, traditional burial grounds and cemeteries.

Local Aboriginal Land Councils and Native Title Corporations have libraries and collections of reports, site cards and cultural materials that may assist like the agency collections. Similarly, local historical societies also contain primary and second source material that may assist with relevant family research, particularly with massacre sites and understanding where Aboriginal people lived and post-contact settlement patterns (for example, pastoral stations and towns). Many archives listed in Table 1 contain information from Church records that were missions, however, there are also international Church archives such as the London Missionary Society and Moravian mission archives, Hernhutt, Germany (for the western Cape York missions of Aurukun, Mornington Island, Mapoon and Weipa) and national Church archives (Presbyterian, Uniting, Catholic, Anglican and Seventh Day Adventist Church) that contain relevant records, particularly those of first contact.

RESEARCH TIPS
KEYWORD SEARCHES

Keywords are the words we use to search on the internet in a search engine such as Google or on a website such as Trove for what we are looking to research. For example, if you wanted to find out about burial mounds in Mapoon, your keyword search may be Mapoon burial mounds.

When researching online archives, catalogues and online search engines, key word searches can be specific or broad. Using advanced search option or filter on a search you can tick boxes to ensure the keywords used are all included and not removed from the search results. When undertaking research, it is important to keep a copy of the results of your keyword search and to make a record of the keywords used in searches (so you do not double up researching or miss something), writing it down somewhere in a notebook is helpful.

New South Wales

Archive Name	Archive Link	Description of Records that could Assist
State Library of NSW (including the Mitchell and Dixson Collections)	Deaths and burials http://guides.sl.nsw.gov.au/c.php?g=671850&p=4729307 https://collection.sl.nsw.gov.au/search?search=anglican%20board%20of%20missions%20records	The Mitchell Library contains collections of the Anglican Board of Missions dating back to the mid nineteenth century including Aboriginal missions such as Yarrabah. There are also collections of the missions of the Australian Presbyterian Board of Missions and the Uniting Church. These records include Births, Deaths and Marriage Books, personal correspondence, annual reports, historical photographs, plans and diaries. The Library also contains historical aerial photographs, oral histories and ethnographies and early books by missionaries and Aboriginal and Torres Strait Islander authors.
Royal Australian Historical Society	https://www.rahs.org.au/	Australia's oldest historical organisation founded in Sydney in 1901, promotes the study of Australian history. The Society organises events, produces publications and provides research advice and support to its membership network of individuals and local historical societies, with a particular focus on New South Wales local and community history. The library contains a valuable research collection of more than 60,000 items on Australian history, including early local histories for areas across Australia and monographs of local areas. These early histories include potential information on Aboriginal burials, unmarked graves, massacre sites and cemeteries.

New South Wales (continued)

Archive Name	Archive Link	Description of Records that could Assist
NSW State Records and Archives	https://www.records.nsw.gov.au/archives/collections-and-research	NSW State Records and Archives hold the records of the NSW government from 1788 to date. These records include those of the Aborigines Protection Board and later agencies such as the Aborigines Welfare Board that controlled Aboriginal people, blanket returns which relate to Aboriginal people, 1832-1835 and 1837-1844. The 19th century 'blanket returns' are lists of Aboriginal people who received blankets from the Colonial authorities. The records are broadly arranged by locality and include both Indigenous and European names for each person as well as their age. Returns also detailed information about individuals and their movements. The State subsidised missionary activity among the Aboriginal people, including that of the London Missionary Society in the 1820s and 1830s; the Reverend L.E. Threlkeld's Mission at Lake Macquarie being notable, and these records also include the establishment of the Mounted Police and the Native Police, which are also interconnected to narratives of conflict and massacres. Original parish maps, survey plans, portion plans and charts are also included in this archive. These plans and maps often show the location of traditional Aboriginal camp sites, burial grounds and settlements.

Queensland

Archive Name	Archive Link	Description of Records that could Assist
Community and Personal Histories, Queensland State Archives (QSA)	https://www.datsip.qld.gov.au/people-communities/aboriginal-torres-strait-islander-family-history	QSA contains detailed documentation and records of Aboriginal and Torres Strait Islander communities due to the control past Queensland governments had over Aboriginal and Torres Strait Islander people's lives. Administration of the 'Protection Acts', such as the Aboriginals and Protection and the Restriction of Sale of Opium Act 1897, led to a high volume of records being created up until the mid-1980s. The Community and Personal Histories' team can help Aboriginal and Torres Strait Islander communities use these records to research your family and personal history. They may be able to help you with other information, such as proving your birth date. These records include missions, reserves, settlements and all government institutions, including Peel Island leprosarium and gaols.
Queensland Museum	https://www.qm.qld.gov.au/Explore/Collections/Cultures+and+Histories+Collections	Queensland Museum Network has a legislated responsibility, as defined by the Queensland Museum Act 1970, to collect, research and promote Queensland's natural, cultural and technological heritage. The collection includes a rich diversity of cultural objects including significant Aboriginal and Torres Strait Islander collections. These records include photographs dating back to the late nineteenth century of Aboriginal missions, camps, settlements and reserves, including cemeteries and traditional burials. These records also include annual protector's reports by Roth and some of the early ethnologists.

Queensland (continued)

Archive Name	Archive Link	Description of Records that could Assist
John Oxley Library, State Library, Queensland	https://www.slq.qld.gov.au/research-collections/aboriginal-and-torres-strait-islander-collections	The John Oxley Library Collection includes photographs such as copies of glass plate negatives of Aboriginal and Torres Strait Islander Communities. This rare collection of glass plate negatives of Aboriginal and Torres Strait Islander people and communities includes images of Barambah, Darnley Island, Mapoon, Saibai Island, Taroom, Yam Island, Yarrabah and York Island. Many of the glass plate negatives are unidentified [Reference: Acc 30020] but show details such as traditional camps at the early days of contact with missionaries and 'Protectors', as well as missions and reserves. There are also more modern reference collections such as the 2280 Craig Holmes Kowanyama photographs, dating from 1974 to 1990 and includes as many as 200 of the photographs are digitised and available online [Reference: Acc 32280]. Some other image collections include the Bloomfield River and District Photographs 1880-1888. This collection includes images of the Bloomfield River, local people and industry established from 1880 – 1886 in the district. As well as the Reverend James Tait Scott Torres Strait Islands Papers 1870s-1890s, including an album which contains approximately 52 letters by Eliza and the Reverend James Tait Scott to Eliza's parents, Mr and Mrs Mitchell. They were sent from various locations including Murray Island, Thursday Island, Darnley Island, Cooktown and more [Reference: Acc 29018]. Norman Tindale was an anthropologist who recorded genealogies of Aboriginal people, mainly in the 1930s. From 1928 he began visiting Aboriginal people living on missions and government stations around Australia. By the end of the 1960s he had photographed thousands of Aboriginal people and recorded many genealogies (family trees). His research is now known as the Tindale Genealogical Collection, parts of which are held at State Library of Queensland. This collection includes genealogies of Aboriginal families for up to three generations.

Queensland (continued)

Archive Name	Archive Link	Description of Records that could Assist
John Oxley Library, State Library, Queensland (continued)		State Library of Queensland has copies of genealogies and photographs for the Aboriginal communities: - Cherbourg (QLD) - Mona Mona (QLD) - Palm Island (QLD) - Woorabinda (QLD) - Bentinck Island (QLD) - Doomadgee (QLD) - Mornington Island (QLD) - Yarrabah (QLD) - Boggabilla (NSW) - Woodenbong (NSW). These records may assist with burial practice information, unmarked graves, cemeteries and information on other types of mortuary traditions and information.
University of Queensland, Fryer Library	https://web.library.uq.edu.au/blog/locations/fryer-library	Fryer Library contains photographs and manuscripts, in particular the Norman F. Nelson collections which contains photos of the Cape York and Torres Strait Islander, missions and reserves from 1936 including Aurukun, Mornington Island, Weipa, Mapoon and Thursday Island. The albums are beautiful portraits and contain annotations as well as plans of the missions and settlements in 1936 and detailed floor plans, as well as a description of the trip. This information may assist with burials and cemeteries as it includes photographs of these places as well as potential burial mounds.

Victoria

Archive Name	Archive Link	Description of Records that could Assist
Public Record Office Victoria	https://prov.vic.gov.au/koorie-services walata tyamateetj: A guide to government records about Aboriginal people in Victoria: https://prov.vic.gov.au/walata-tyamateetj-research-guide Finding your mob: Researching Aboriginal family history at the Victorian Archives Centre: https://prov.vic.gov.au/finding-your-mob	The Koorie Records Unit provides a culturally sensitive Koorie Reference Service to provide support and advice to Aboriginal people wishing to access records relevant to their personal and community histories develops resources, programs and initiatives that increase the knowledge, accessibility and use of Victoria's unique collection of government records relating to Aboriginal people. The Koorie index of names is a database which can be searched to locate references to Victorian Aboriginal people who are mentioned in some archival records that relate to Aboriginal affairs (1839-1946). This database is not accessible online and is only searchable on-site at the Victorian Archives Centre in North Melbourne. The index is not a dossier of Aboriginal people, groups and places in Victoria. The information may assist with identifying unmarked graves and where markers or tombstones cannot be made out to identify graves. The Public Record Office also includes information from the State and any other agencies on the graves, cemeteries and unmarked greaves within the missions, reserves and settlements of Victoria for Aboriginal communities. This information includes historical plans, photographs and correspondence.
Culture Victoria	https://cv.vic.gov.au/stories/aboriginal-culture/ https://web.archive.org/web/20040831012400/http://www.abc.net.au/missionvoices/	The Mission Voices web site which has now been archived (but still accessible at the link shown), contains background information, stories, timelines and maps on Victorian missions and reserves, including Ebenezer, Lake Tyers, Coranderrk, Cummeragunja, Framlingham and Lake Condah Missions.

Victoria (continued)

State Library of Victoria (SLoV)	https://guides.slv.vic.gov.au/aboriginalfamilyhistory	State Library of Victoria has records, resources, record repositories and basic research strategies associated with Aboriginal and Torres Strait Islander communities, mostly relating to the Victorian Aboriginal mission experience to date. Resources include other published guides and websites for relevant government agencies such as libraries and archives. These websites provide in-depth information about available records, facilities and services provided by each agency. Photographs dating back to the late nineteenth century of Aboriginal missions, camps, settlements and reserves, including cemeteries and traditional burials and records from some of the early ethnologists are kept in collections with the SLoV. Information which can assist with identifying unmarked graves, understanding mortuary practices and cemetery history.
Museums Victoria	https://museumsvictoria.com.au/bunjilaka/	Museums Victoria contains oral histories and cultural objects, including possum skin cloaks that have a history connected to Aboriginal people in Victoria dating back to the 19th century. These collections include records which may assist with identifying family members in cemeteries and unmarked graves and understanding the history of mortuary practices.

South Australia

Archive Name	Archive Link	Description of Records that could Assist
State Library of South Australia	https://guides.slsa.sa.gov.au/Mountford https://www.catalog.slsa.sa.gov.au/record=b1627444	In July 2005, the State Library hosted the launching of the resource **Finding your own way**, SA Link-Up's 'self-help' guide to tracing Aboriginal families and individual histories. Compiled by historian Dr Karen George, and staff from State Records and SA Link-up, this resource contains details of the institutions in South Australia that have been custodians of Aboriginal children, including how to find and access their records. The **Find and Connect Website**, launched in 2011 for Forgotten Australians and Former Child Migrants, drew on the resources in Finding your own way to bring together historical resources relating to institutional 'care' in South Australia. You can use this website to find information about policies, public figures and legislation. The library contains several finding guides which would be useful for identifying information for Aboriginal and Torres Strait Islander histories, missions and reserves including: https://guides.slsa.sa.gov.au/sb.php?subject_id=81789. The Mountford Sheard collection contains the records of Charles Pearcy Mountford (1890-1976) was a South Australian ethnologist and ethnographer who advanced from amateur status to become an important figure in the field of anthropology in Australia. His archival collection (PRG 1218) contains photographs, field notes, diaries, artworks and correspondence, which may assist with understanding early recordings of mortuary practices, burials and unmarked graves.

South Australia (continued)

Archive Name	Archive Link	Description of Records that could Assist
State Records of South Australia	https://archives.sa.gov.au/finding-information/discover-our-collection/aboriginalfamilies/aboriginal-access-services	State Records of SA hold many of the records relating to Aboriginal people that were created by the Aborigines Office, the Aborigines Department and the Department of Aboriginal Affairs. The government agency reference for these authorities in their catalogue is GRG52. The information in records were created by: ■ The Chief (formerly Colonial) Secretary's Office ■ Lands Department ■ Education Department and schools ■ Department of Correctional Services ■ Police Department ■ Government Resident of the Northern Territory ■ South Australian Museum ■ Public hospitals They also have a searchable database of names of Aboriginal people identified in key series within their collection, known as the Aboriginal Information Management System (AIMS). The database is an important resource for Aboriginal people researching their personal, family and community histories. The database comprises more than 140,000 entries and include: ■ tribal names ■ nicknames ■ age ■ sex ■ location ■ description of record ■ State Records reference number.

South Australia (continued)

Archive Name	Archive Link	Description of Records that could Assist
State Records of South Australia (continued)		The earliest South Australian record references in AIMS date from 1836. AIMS also identifies relevant references in Northern Territory Records to 1911. This information may be useful in reconstructing names of people for headstone or unmarked graves.
South Australian Museum	https://www.samuseum.sa.gov.au/collection/archives/search	South Australian Museum includes archival records for Aboriginal and Torres Strait Islander communities, including the Norman Tindale collection, missionaries such as Pastor Albrecht, records of the Aboriginal Affairs and Reconciliation Division, Aboriginal and Historic Relics Unit, and Anthropological Society of South Australia, as well as portraits, plans and additional manuscripts relevant to Aboriginal people within South Australia, which may assist with unmarked graves, cemeteries and mortuary practices.

Western Australia

Archive Name	Archive Link	Description of Records that could Assist
State Library of Western Australia	https://encore.slwa.wa.gov.au/ https://www.slwa.wa.gov.au/wa-story/indigenous-stories	The State Library of Western Australia contains records including historical photographs, plans and diaries, and cultural information such as oral histories, as well as ethnographies and early books by missionaries and Aboriginal and Torres Strait Islander authors. This information may assist with researching unmarked graves, cemeteries, massacre sites and understanding traditional mortuary practices.
State Records Office of Western Australia	https://www.wa.gov.au/organisation/state-records-office-of-western-australia https://www.wa.gov.au/service/aboriginal-affairs/aboriginal-cultural-heritage	State Records Office of WA includes records such as Aboriginal oral histories, genealogies and languages including cultural resource collections. Access the Storylines Aboriginal history database as well as access to information on Aboriginal sites, other heritage places and Aboriginal Heritage Surveys is available via the Aboriginal Heritage Inquiry System (AHIS) that is administered by the Department of Planning, Lands and Heritage. This information can assist with understanding traditional burial sites locations, mortuary practices, cemeteries and unmarked graves.
Department of Communities, Child Protection and Family Support	Looking west: A guide to Aboriginal records in WA www.dcp.wa.gov.au/SupportingIndividualsAndFamilies/Documents/LookingWest.pdf Signposts: A guide for children and young people in care in WA from 1920 signposts.cpfs.wa.gov.au	The Department has put together a guide which documents where all State and Church government records on Aboriginal and Torres Strait Islander families are within Western Australia that are relevant to the Stolen Generations and institutionalisation of Aboriginal and Torres Strait Islander people. These records include primary and secondary sources for missions, reserves, settlements and government institutions. This information can be of assistance to identify traditional burial sites locations, understanding mortuary practices and identifying cemeteries and unmarked graves.

Australian Capital Territory

Archive Name	Archive Link	Description of Records that could Assist
ArchivesACT	www.archives.act.gov.au	ArchivesACT provides access to ACT government records, including records about divorce, child welfare, cemeteries, schools and housing for Aboriginal people. Records relating to the area that is now the ACT are also held by State Records NSW and by the National Archives of Australia. These records may assist with the piecing together information on Aboriginal people and cemeteries in the ACT.
ACT Office of Aboriginal and Torres Strait Island Affairs	www.communityservices.act.gov.au/atsia	The ACT Government undertook an extensive genealogy project with the ACT Aboriginal community during 2010-2012 to compile a comprehensive genealogical database. This project was called the Our Kin, Our Country genealogy project, The database documents more than 5000 individuals and includes a collection of some 2000 primary source records. This information can assist with identifying individuals in unmarked graves and cemeteries and is a useful resource.

Northern Territory

Archive Name	Archive Link	Description of Records that could Assist
Genealogical Society of Northern Territory Inc	http://www.gsnt.org.au/sites/default/files/Cemeteries%20of%20the%20Northern %20Territory.pdf	This group formed in 1981 focuses on family history and contains list of remote graves and grave plaques in the Northern Territory. This information can assist with identifying cemeteries and is a useful resource.
The Northern Territory Archives Service Library and Archives NT	https://nt.gov.au/leisure/arts-culture-heritage/libraries-and-records/search-the-nt-archives https://ntl.nt.gov.au/search-tools	The Northern Territory Archives Service holds Northern Territory Government archives created since the government's establishment in 1978, as well as inherited records from the periods of administration by the South Australian Government (1863-1910) and the Australian Government (1911-1978). It also preserves community archives such as oral histories, personal papers, photographs and organisation records. The Northern Territory Archives Service is the designated first point of contact for Stolen Generations researchers seeking access to Northern Territory Government records. Primary sources such as historical photographs, plans and correspondence are held in this collection and they can assist with identifying individuals in unmarked graves and cemeteries and is a useful resource.

Tasmania

Archive Name	Archive Link	Description of Records that could Assist
Tasmanian Archives + Heritage	https://libraries.tas.gov.au/archive-heritage/Pages/default.aspx https://libraries.tas.gov.au/archive-heritage/guides-records/Pages/Aboriginal.aspx	Tasmania set up Australia's first library in 1825 and was the first state in Australia to deliver an integrated library and archive network. Tasmanian archives include records not only for Tasmania but for the three islands—King, Flinders and Bruny. Archival records, books, photographs and plans of Aboriginal people within Tasmania, from 1825 to date. Although there was no agency with specific responsibility for Tasmanian Aboriginal people between 1833 and the 1970s, there are many different records that exist detailed at this archive, including records such as Lands Department records for Cape Barren Island, Department of Education records and Orphan School records etc.

RESEARCH TIPS
NAMING HEADSTONES

There are several key resources/records to draw upon that may assist Aboriginal and Torres Strait Islander communities who wish to attempt to name headstones in cemeteries with unmarked graves or areas of unmarked graves.

Electoral rolls are lists of people who registered to vote in state, territory or federal elections. They are updated before every election and may provide information such as:

- Names and family members
- Address
- Occupation
- Age
- Annotations when someone is deceased and where they are buried.

Most census records do not contain details of Aboriginal and Torres Strait Islander people on electoral records until after 1967, however in Central Australia and Northern Territory there are records dating to the 1950s. By cross referencing these details, with known grave markers and talking them through with Elders it may be possible to reconstruct the names of unmarked graves for tombstones.

Blanket returns and ration books

Early Protectors reports include the names of Aboriginal people, their approximate age and their location and language group/clan name and the years they received blankets or rations. These records are often called blanket returns and rations books.

Birth, Deaths and Marriage Books

Missionaries maintained birth, deaths and marriage books, which detailed names, birth dates, family and location as well age and cause of death. These books are not totally reliable, as there are many traditional camps and settlements missed in these records who were living outside of the mission. Similarly, these records often don't include Aboriginal and Torres Strait Islander people who were not baptized or Christianized but they can assist piecing together information for unmarked graves.

Station Journals

In outback areas cattle stations with Aboriginal workers usually kept business records in the form of a journal and these may help to identify individuals. Such records may still be held on large properties or have found their way into larger libraries. The largest central repository being The Noel Butlin Archives Centre at the Australian National University which is partly searchable online. Local History Groups may also have old photographs worth investigating.

Unmarked grave identified with GPR between two marked graves at Mapoon Cemetery. This person's grave was known to exist, however the exact location of their burial was forgotten, and through identification with GPR, is now able to be commemorated appropriately (Source: E. St Pierre).

Recording Elders Stories

One of the most powerful and important things we can do to protect our old people's knowledge and cherish their stories for future generations, is to take the time to record it, if culturally appropriate. Here is some information to assist if you have family members who are willing and able to be recorded:

a) First do some preparation, think about what you would like to ask, what kind of venue (being on country or at home?) would be best to do the interview and make it comfortable for the person being interviewed and best for sound, and make sure whatever device you are using to record the interview is charged or you have extra batteries.

b) Think about what kind of prompts may help with the interview, for example a photograph album, old plans or maps, a sibling – things that can help generate memories.

c) Make sure you have consent from other family members or guardians and document it on a form if needed, and think about where this information may be stored long term.

d) Try asking open questions that encourage discussion, not concise questions that lead to a yes or no answer. Do not ask leading questions, let the person tell their story.

Some resources to help with oral history include:

▪ Oral History Australia branches have a list of resources that may help and tips, as well as training: https://www.oralhistoryaustralia.org.au/

▪ FamilySearch – Creating oral histories: https://www.familysearch.org/wiki/en/Creating_Oral_Histories

▪ Smithsonian Institution – Folklife and oral history interviewing guide: https://folklife.si.edu/the-smithsonian-folklife-and-oral-history-interviewingguide/smithsonian

▪ Oral History Association (USA) Web guides to doing oral history: http://www.oralhistory.org/web-guides-to-doing-oral-history/

▪ Oral History in the Digital Age: http://ohda.matrix.msu.edu/

▪ Thomas MacEntee, Preserving your family's oral history and stories, Unlock the Past, 2014 – available online and in many libraries, see it listed with the National Library of Australia for example: https://catalogue.nla.gov.au/Record/6451194

▪ Penny Taylor & AIATSIS, Telling it like it is: A guide to making Aboriginal and Torres Strait Islander history, Aboriginal Studies Press, 1996

▪ Beth M Robertson, Oral History Handbook, Oral History Association of Australia, SA branch, Fifth Edition 2006 – available from Oral History Australia SANT: http://oralhistoryaustraliasant.org.au/publications/

Elders and rangers from Mapoon, Queensland, discussing their memories of the locations of the burial places of their family and ancestors (Source: M.Sutton).

TRAUMA, RACISM AND TRUTH

Researching and finding out information about loved ones and ancestors can be exciting, enlightening and incredibly rewarding but it can also be saddening, and sometimes traumatic. Historical records since invasion are seen through the lens of colonial bias, prejudice and racism, and just because something is written down, does not mean it is true or factual. There are many accounts written by missionaries, the State and early ethnographers that are inaccurate and can tell us more about the person writing the account then the people the account is being written about. Reading this information can cause trauma and sadness and sometimes feelings of anger and despair. Similarly, not being able to find information about an ancestor to help identify their grave can also provoke these negative feelings.

Just like today, cultural knowledge can be sacred and secret and early Europeans who interacted with Aboriginal and Torres Strait Islander communities were not shown or shared this knowledge, particularly as they could be punished, killed or harmed if they practiced their traditional culture, language or burial customs. Many early records were also written by men (male missionaries, male Protectors, male anthropologists/ethnographers and surveyors, etc) and knowledge of women's cultural knowledge and traditions, particularly in areas of mortuary practice and burials, is often missing from their accounts.

Researching can also lead to increased feelings of responsibility. Finding out information about our Elders and ancestors, may lead to answers or information arising not known to our parents or siblings and cousins that are still here today. Sometimes this information (as often in non-Indigenous Australian communities) can lead to a new understanding (for example, on parentage of family members or for native title), that is not always welcome knowledge about who we think we are.

When researching, it is important to be aware of these positives and negatives and to have emotional support from a friend, family member or colleague to talk to if these feelings arise. Some sources for mental and emotional support or if you are feeling anxious include organisations such as Beyond Blue, 1300 22 4636 https://www.beyondblue.org.au/about-us/contact-us The Trauma and Grief Network http://tgn.anu.edu.au/resource/indigenous/ and Lifeline 13 11 14 https://www.lifeline.org.au/ are some resources to assist.

CHAPTER TWO

ARCHAEOLOGY, GEOMORPHOLOGY, PEDOLOGY

and their role in identifying and interpreting unmarked graves and burials

Archaeology is the study of the human past through the analysis of material culture including artefacts, occupation sites and human remains. Excavation is a frequently used method to investigate buried sites. These methods are destructive and may not align with the cultural values of Aboriginal and Torres Strait Islander people, and the way they would like to see their sites investigated. However, archaeologists can also employ non-invasive methods (meaning methods that will not impact on the burial or cemetery) which will be discussed in Chapter 4. Geomorphology is the study of landforms and the processes of landform evolution. It is mainly descriptive and does not often deal with landscapes at the scale of a single site but more often sets out to explain the nature and history of an entire hillside, river catchment or mountain range, for example. Pedology is a term that means 'soil science' and focuses on understanding how soils are formed and distributed in the landscape. Many Aboriginal and Torres Strait Islander archaeological sites leave no evidence remaining on the surface. These 'invisible' sites are a challenge to find, however, at sites where human activity disturbed the soil, an archaeological trace is left that can be identified at a later time. Geomorphology and pedology play an important role in identifying these types of sites.

Most recent blown sand

Buried soil or flood drape

Eroding late Pleistocene clayey sand
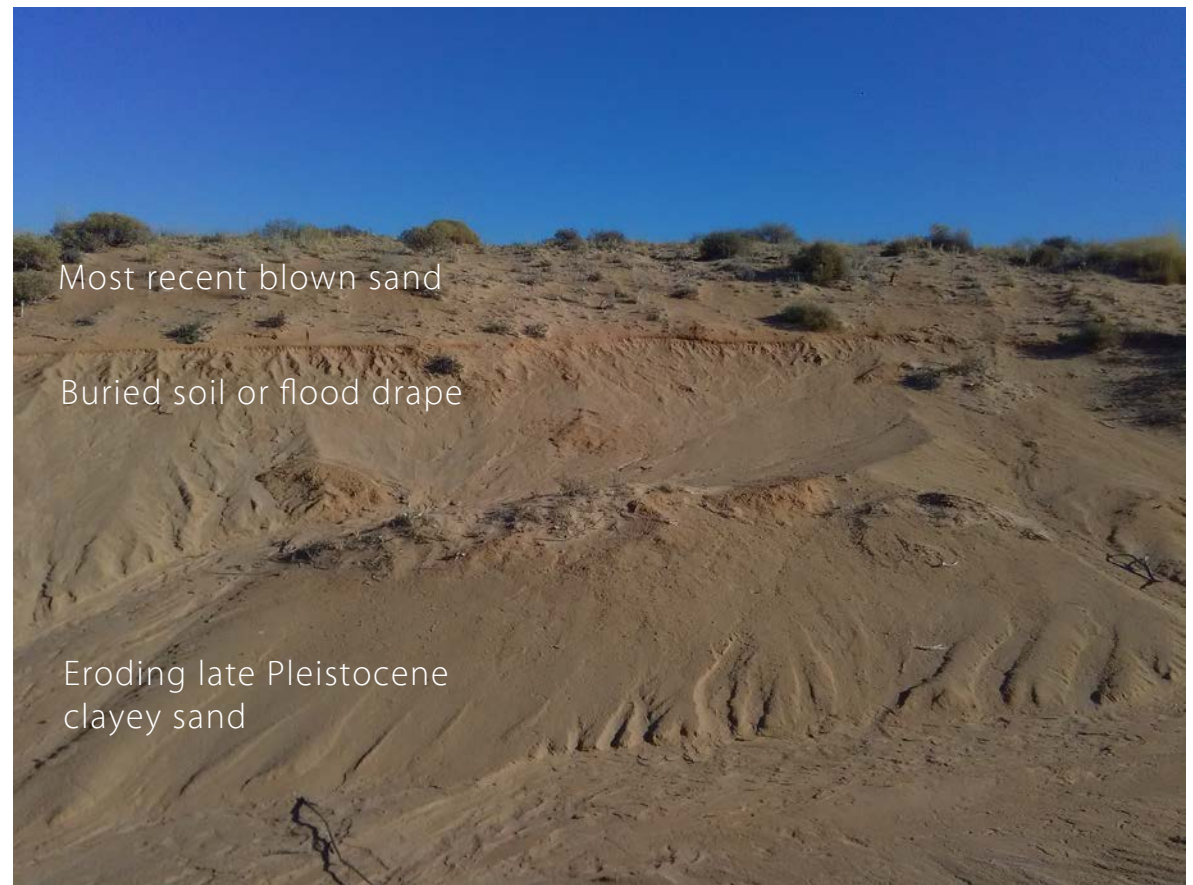
Eroding bank of a channel of Eyre Creek in the Simpson desert. The top of the bank is capped by recent (post European) sand which will not contain Aboriginal material and the basal clayey sand may be too old. Only the thin brown line of clayey sediment is worth closer inspection as it is either a buried soil layer or a drape of mud deposited by a large flood. In either case it may seal Aboriginal sites (Source: P. Mitchell).

Burial and Grave Sites

Burials and graves are some of the most important 'invisible' archaeological sites because of their cultural significance. The burial practices (also known as mortuary practices) of Aboriginal and Torres Strait Islander people differed over time and place. Different types of burial practices left different types of archaeological evidence, and this evidence can be used to help identify the location of a burial. Consider some examples of different mortuary practices found throughout Australia (and also seen in many places around the world) prior to the European invasion and into the contact period:

- Human remains may have been buried in prostrate, flexed, crouched, or bundled positions. They may be entire corpse or just skeletal remains bundled and wrapped in bark, animal skin, or blanket. These forms all required different grave shapes and dimensions which may be identified by grave cuts, even where the human remains have disappeared.

- Bundled burials may be placed in crevices in rock outcrops, hollow trees, or even within hollow logs that have been prepared and decorated for use as 'coffins' or grave markers. The best-known examples of these are the pukumani poles of the Tiwi people. Preparation of the remains for eventual burial in or adjacent to these poles usually involved an initial platform burial with subsequent washing and painting of the skeletal remains.

- Burials of cremated remains are known from all over Australia, in fact, one of the oldest cremations in the world is from Australia and cremated remains have been known to survive to great antiquity.

- Burials could include the placement of grave goods and/or personal items of clothing, adornment or other items which may or may not have survived over time.

- Human remains may have been laid on a layer of grass or twigs, wrapped or covered by sheets of bark, and perhaps painted/dusted in ochre. Although the associated plant materials do not often survive, organic materials can leave microscopic evidence such as pollen and phytoliths; and ochre residues within soils, which can still be identified even after tens of thousands of years.

- Burials and cremations were sometimes mounded, with the mound built up with soil, sand, branches, logs and/or large stones. They varied considerably in size and shape and have been found throughout many parts of Australia. For example, in western NSW mounds were as much as 3m in diameter and over 1m high and in northern Queensland mounds have

Burial and Grave Sites (continued)

been recorded up to 3m high. Over time mounds frequently deflate (flatten and spread out) as the grave contents decay, the fill consolidates, and the mound erodes. A careful examination of the soil of these sites may still reveal a grave location.

- In some parts of the country burials were concentrated in what may loosely be described as cemeteries. This was especially common along the Murray River valley, and less frequently along the eastern coast, such as the cemeteries at Broadbeach in southern Queensland and Fingal in northern NSW. We know little about grave orientation or the arrangement of cemeteries, but they appear to be more randomly organised than in modern European cemeteries.

- Both cremated and uncremated burials were sometimes associated with middens and other types of archaeological sites. A surprising number of burials near Sydney have been found in shell middens and rock shelters. It is unclear if this was a traditional practice but there is evidence that many of these were not deliberate burials but were of people who died from smallpox or another introduced disease at a time when there were few people present and able to conduct the normal ceremony. This may be an example of how burial practices changed over time and as a consequence of the European invasion.

Aboriginal tombs near Menindee, NSW Drawn by Major Thomas Mitchell. The scale seems exaggerated, but compare with the Victorian photograph below.

(Source: https://www.wikiwand.com/en/Thomas_Mitchell_(explorer))

Aboriginal grave in Victoria. The photograph is undated and the site not located, it appears to be in northern Victoria and is probably late Nineteenth Century. When the logs are consumed by termites or burnt in a bushfire the soil mound will degrade to nearly the same level as the sandplain and the grave will lose almost all surface visibility. Very similar graves are also recorded in South Australia.

(Source: https://www.slv.vic.gov.au/pictoria/gid/slv-pic-aab65024/1/a13421).

CASE STUDY
Narrabeen Man

In 2005, one of the most remarkable 'burials' from anywhere in the world was excavated from an urban street in Narrabeen, NSW. This individual became known as Narrabeen Man. He was killed by a ritual death spear 3,700 years ago and his body lay near the crest of a coastal dune lying on his side with one arm over his head. His remains were buried, not by human practices, but as a result of natural process where the body was covered by drifting sand. This site could not have been predicted using any geomorphic approach and it is unlikely that these remains would be detected by GPR survey. It was chance that he died there, and it was chance that his remains were ever found. Further information about Narrabeen Man can be found at:

https://www.northernbeaches.nsw.gov.au/library/your-library/news/story-narrabeen-man

https://www.abc.net.au/catalyst/narrabeen-man/11010512

WARNING – THIS VIDEO CONTENT CONTAINS IMAGES OF HUMAN REMAINS

SITE LOCATION
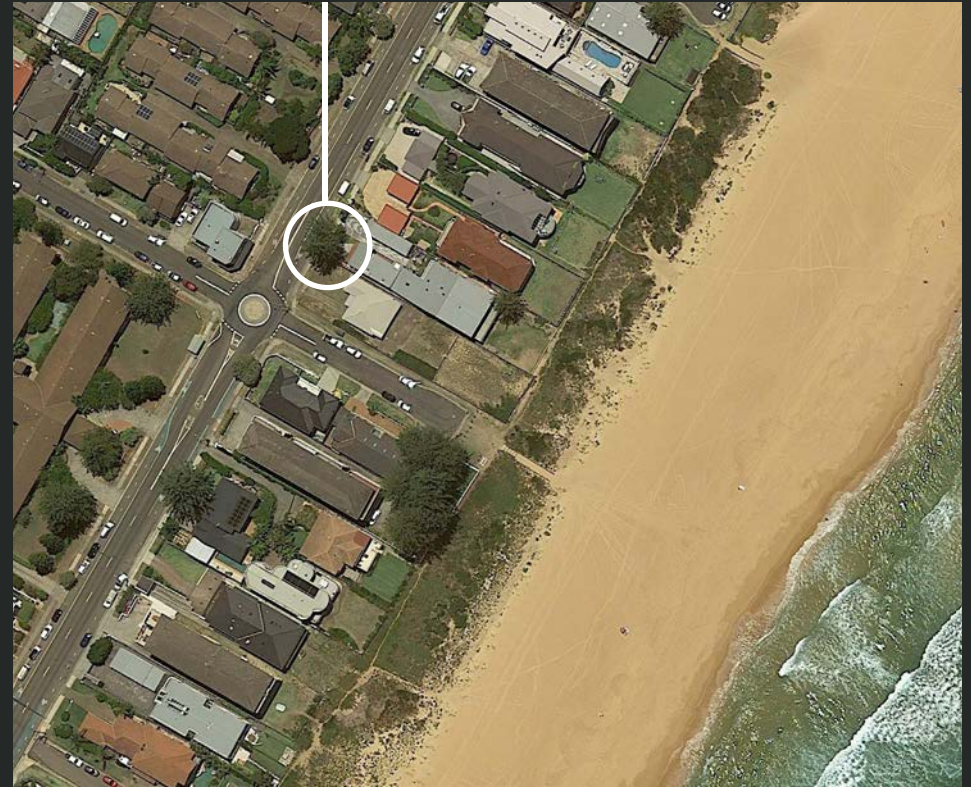
(Source: Google Earth)

How to Find Burial and Grave Sites

By far the best guide to locating lost graves is a record or community memory of burials being in a particular place. However, where this information is unavailable, there are also some more general indicators that may help. We can identify features and places where Aboriginal and Torres Strait Islander burials are unlikely to be located at a scale of a tens to hundreds of metres. Equally, we can identify signs of features and places that are generally known to be associated with burials, at a scale less than ten metres. When considering these signs and places, we must keep in mind that Australian landscapes have changed dramatically over tens of thousands of years as a consequence of climate change, rising and falling sea levels, shifting river patterns, changes in vegetation and processes such as erosion, therefore knowing the landscape history is important in determining the sensitivity of a place, as these may have changed over time. Below are the types of landscapes and other signs where burials are more or less likely to be found:

Landscapes with low sensitivity for burials

- Shallow and /or stony soils.

- Heavy clay soils that are difficult to dig.

- Steep slopes.

- Rocky outcrops (unless rockshelters are present).

- Flooded or saturated ground.

- Places of active regular erosion such as beaches (unless the coast is retreating and burials in former dunes are exposed).

- Anywhere that soil disturbance by European activities has been so extreme that the landforms have been reshaped, and the soil has been removed, or mixed. But be aware that even in these locations it is possible for burials and other sites to survive below the depth of disturbance.

Landscapes with high sensitivity for burials

- Deeper sandy soils that are easy to dig with simple tools.

- Subtle changes in micro-topography (depressions or mounds) that may be detected by LiDAR or simple aerial photography.

- Changes in vegetation growth in wet or dry seasons that reflect different soil nutrient or moisture conditions, identifiable during environmental surveys. These may only be visible under certain conditions and therefore repeated visits to a suspected site is desirable.

- Identifiable soil profile disturbance in an excavated pit, i.e. grave cuts. However, graves in a uniform sand will show little profile disturbance after a fairly short time and may be indistinguishable from adjacent undisturbed soil.

- The presence of surface markers such as free-standing stones, carved trees, plantings of special tree species, cairns and other grave markers such as coral or shells. Post European invasion grave markers included more diverse materials such as; remnants of fencing, simple headstones (usually timber), coloured bottles and heat shattered glass, ceramics, metal, and presence of ornamental plants such as rambling rose.

- The presence of grave goods such as stone axes and other artefacts, including stain traces of caskets and intact coffin hardware including nails, screws, handles and name plates in more recent graves.

N

Linear sand dunes

Lunette

Lake Tandou

Darling River

0 2 4 6

km
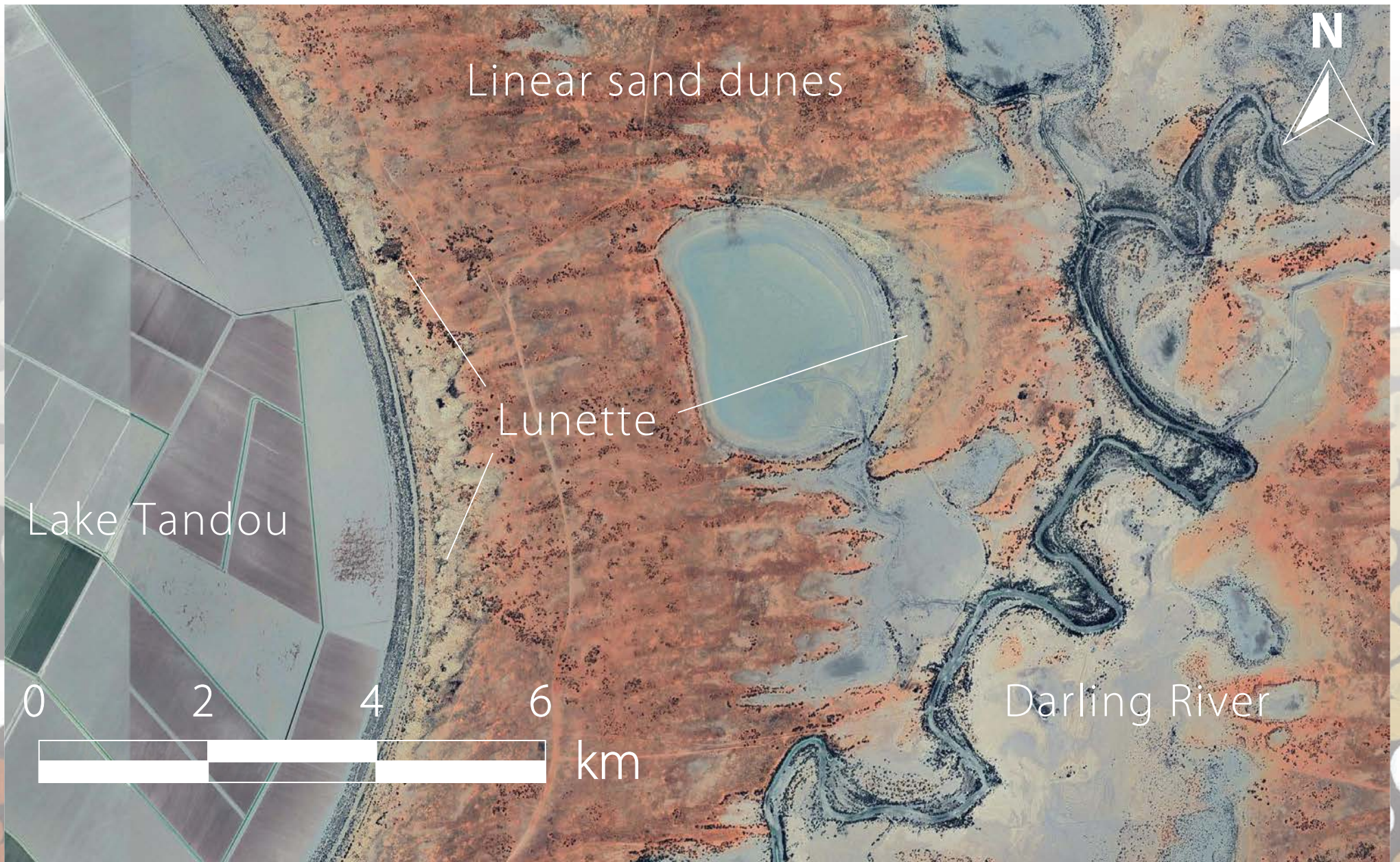
Lake Tandou, western NSW. Plenty of easy digging sand but burials are only found in the lunettes on the downwind side of the lakes and sometimes in small sand deposits on the eastern bank of the river. The grey soil is too hard to dig and the linear dunes were not favoured (Source: Google Earth).

Soil <40 cm

A very thin stony soil profile on steeply dipping quartzose sandstone and slate in southern NSW. Burials are most unlikely as the soil mantle is so thin and stony (Source: P.Mitchell).

A deep sand with characteristic iron pan developed in a podzol soil profile on a sand deposit near the Nepean River in Sydney. Digging is easy to a depth of 60-80 cm and burials are possible. However, the acid soil will quickly destroy bone and the rate of soil mixing in the single grain sand is so rapid that little trace of any grave cut may remain in only a few thousand years and OSL dating is challenging (Source: P.Mitchell).

In many parts of central NSW, carved trees were often used to mark the grave sites, particularly those of important individuals. Such trees may survive several centuries but are very susceptible to fungal or termite attack, fire, land clearing and museum collecting. Consequently, very few remain intact and these are usually the most recent examples that were carved with metal tools. A considerable number are held in museums but often with little information about where they came from. Carved trees were not only used to indicate graves, but were also associated with bora grounds. The tree shown here is one of three that are believed to surround a grave in midwestern NSW. In the 1980s a professional aborist cut a 'window' into the living wood to reveal the carving at the request of the NSW National Parks and Wildlife Service. In 2021, the Central Tablelands Local Land Services and La Trobe University planned to undertake a GPR survey of the site. Results have not yet become available.

An example of a carved tree, NSW (Source: P.Mitchell).

Many of the surface indicators can also be associated with other forms of ground disturbance which need to be eliminated, such as:

- Land clearing patterns.

- Treefall pits and stump mounds.

- Charcoal burning pits etc.

- Traces of prospecting and mining.

- Small excavations for removal of sand/soil/clay etc.

- Surveyor's marks.

- Old tracks, fence lines, or stock yards.

- Vehicle bog holes.

- Old or collapsed animal burrows or bird mounds.
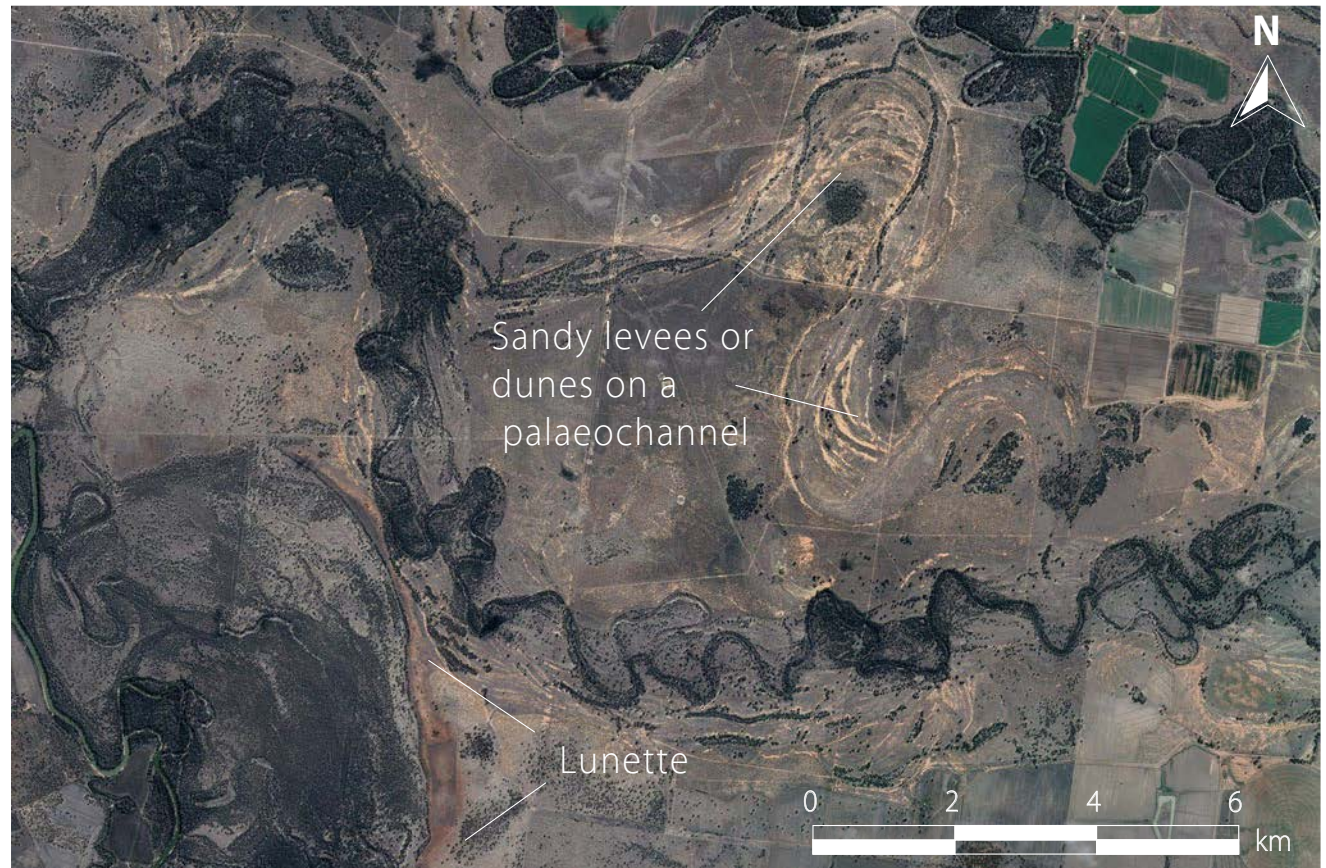
Distributary channels of the Wakool River in the NSW Riverina. Mostly grey clay country with a sandy lunette on the margin of a fossil lake and sandy bars or low dunes parallel to a larger palaeochannel. These sandy areas have much higher prospects of containing burials then the rest of the landscape (Source: Google Earth).

CASE STUDY

Lismore Region Soils Map

After considering the positive and negative indicators of potential burial and grave sites we can use the available mapping to screen out landscapes that are less promising. As an example, consider the Lismore Quaternary Geology map. This map depicts 52 units (including eight anthropogenic or sub-aqueous units – types of descriptions of soil units) and five different bedrock types. The likelihood of any one of the 39 other units containing Aboriginal burials can be judged to some extent on the nature of the land surface and the associated soils.

For example, intact burials would not be expected in certain soils (anthropogenic units) all created in the last 200 years by European development activities. Burials may have previously existed in these locations and some trace of them could still exist in disturbed soil, however the likelihood is low given the destructive nature of European development activities. The sub-aqueous units are defined on the basis of present water level and active sedimentation, and these too can be excluded. The classification of the bedrock areas was not included in this analysis as their description provided little information about the nature of the landscape. Within the other mapped areas, the likelihood of burials can be judged to be very low in those landscapes that are regularly inundated by tidal water, wet and swampy, made up of coarse sediments (gravel and boulders), composed of saline mud and clay, or are short lived and active landforms such as alluvial channel bars and beaches. Where the landscape is better drained, the soils are dominated by sands, and the landform has some longer-term stability, then burials are more likely.

Using a simple five step judgement scale from None to High, each of the Quaternary units on the Lismore map can be scored for its possibility of retaining burials. At first sight this data does not seem to be of much assistance in the search for burials but when you realise that only four map units are rated as having moderate possibility and 33 are rated as having very low to none, it does focus attention on a few locations and effectively rules out a large number of areas.

A salt marsh, reed swamp environment with scattered mangroves on a tidal stream near Sydney. The soil is organic sand but the whole profile is saturated, probably has an acidic pH, and burials are unlikely (Source: P.Mitchell).

CASE STUDY
Lismore Region Soils Map (continued)

Landscape unit code and description	Likelihood of burials	Comment
Qhap Holocene floodplain	Very Low	Zone of active flooding
Qhal Holocene levee	Moderate	Better drained, lighter soil, adjacent to river
Qhas Holocene backswamp	None	Permanently wet
Qhaa Holocene palaeochannel	Very Low	May have a levee
Qhab Holocene channel bar	None	Very active landform, i.e. too young
Qpat Pleistocene terrace	Low	Higher ground
Qpa Pleistocene alluvial plain	Very Low	Poorly described
Qap Quaternary floodplain	Very Low	
Qavf Quaternary alluvial/colluvial fan	None	
Qav Quaternary valley fill	Very Low	Poorly described
TQpat Tertiary to Pleistocene high level terrace	Low	Higher ground
Qhbb Holocene sandy beach	None	Very active landform
Qhbbg Holocene gravel beach	None	Very active landform
Qhbf Holocene backbarrier flat	Very Low	Extensive with few distinguishing features
Qhbd Holocene dune	Moderate	Well drained sand

CASE STUDY
Lismore Region Soils Map (continued)

Landscape unit code and description	Likelihood of burials	Comment
Qhbr Holocene beach ridge	Low	Moderately extensive with few distinguishing features
Qpbd Pleistocene dune	Moderate	Well drained sand, but generally acid soil
Qpbdr Pleistocene bedrock mantling dune	Moderate	Well drained sand, but often shallow, and with an acid pH
Qpbr, Qpbr1, Qpbr2 Pleistocene beach ridge and strandplain	Very Low	Extensive with few distinguishing features
Qpbw Pleistocene beach ridge swale and deflation hollow	Very Low	Erosion of large areas may reveal isolated burials
Qbf Pleistocene backbarrier flat	Very Low	Extensive with few distinguishing features
Qpb Pleistocene undifferentiated barrier	Very Low	Poorly described
Qhek Holocene coastal lagoon	None	Permanently wet
Qhei Holocene interbarrier creek	None	Active wet landform
Qhes Holocene saline swamp	None	Active wet landform, generally acid soil
Qhef Holocene tidal delta flat	None	Active wet landform, often acid soil
Qher Holocene estuarine shore	None	Active wet landform, often acid soil
Qhem Holocene estuarine basin and bay	None	Permanently wet, generally acid soil
Qheb Holocene estuarine in channel bar and beach	None	Very active landform

CASE STUDY
Lismore Region Soils Map (continued)

Landscape unit code and description	Likelihood of burials	Comment
Qhea Holocene palaeochannel fill	None	May have a levee
Qpe Pleistocene estuarine plain	Very Low	Moderately extensive with few distinguishing features
Qpef Pleistocene tidal delta flat	None	Wet
Qhs Holocene freshwater swamp	None	Wet
Qpu Pleistocene undifferentiated	Very Low	Poorly described
Qhac Holocene alluvial channel	None	Very active landform
Qhec Holocene estuarine channel	None	Very active landform, often acidic sediment
Qhekw Holocene coastal lagoon	None	Wet
Qhbkw Holocene barrier lake	None	Wet
Qmi, Qmw Anthropogenic	None	Totally disturbed, but may retain burials below disturbance base.

Losses and Threats to Burial and Grave Sites

Not only can the location of graves be 'lost' but the survival of grave contents is very dependent on the depth of burial, nature of the soil, and time. In saturated anerobic (no free oxygen) soils even soft human tissue and other organic material can be preserved. But most graves are located in free draining sands, which very often have an acid pH. With the passage of moisture through the soil soft tissues decompose within a couple years and in acid soil bones can dissolve within a few decades (however, teeth last longer). Deeper burial, lower temperatures, and aridity, slow the decay processes but in time only the most durable grave goods and teeth may remain. These soil conditions are measurable and we have enough data about the preservation of human remains that the condition of grave contents can be predicted with some reliability. In alkaline soils and particularly in clays, bones can accumulate a thick coating of carbonate or dark manganese/iron staining. The intensity of such staining or encrustation is related to the time since burial but is not a reliable age indicator.

Aboriginal grave eroding from a coastal dune in Tasmania. Note the large sandstone clast on the surface and several rounded pebbles. It is not known what significance these have (Source: https://www.aboriginalheritage.tas.gov.au/cultural-heritage/aboriginal-burials**).**

Graves can also be lost to natural erosion processes and this is particularly important where graves are located on or near river banks, in eroding lunettes (e.g. Lake Mungo), and in dunes close to a river or the coast where erosion is active. These processes are likely to increase under a changing climate. For example; on the coast of NSW and southern Queensland recurrent storms driven by east coast lows or degraded tropical cyclones cause serious beach erosion on about a decadal cycle. With sea level gradually rising this process is shifting the coastline landwards and any graves formerly in the foredune are under threat. Additionally, graves and other sites higher in the outer barrier dunes can be breached and scattered wherever the dunes have lost vegetation and are subject to blowouts. Similar risks apply in northern Australia driven by tropical cyclones but in that region the effects may be more frequent and rising sea level may advance further inland as the coastal dune sequence is often flatter and the coastline may retreat more quickly.

The application of geomorphic and pedologic knowledge in the search for Aboriginal and Torres Strait Islander burials can assist in identifying areas which are more likely than others to retain them. This approach can also assist in understanding such sites when they are located and may provide insights into site history. On their own however, no amount of geomorphic or pedologic work will have greater value than reliable historic data or community memory. Alone we are limited but together we can be much stronger.

Prof. Conyers and Dr St Pierre looking for unmarked graves using GPR at Mapoon Cemetery, QLD (Source: J. Travaglia).

The Lost Graves of Bennelong, Bungaree and Flinders

In the first decades of white settlement in Sydney Cove three names stand out in the history books. These people were known to one another and interacted positively to improve knowledge and understanding of the strange situation that both Aboriginal people and the invaders found themselves in at the end of the 18th Century. These men were Woollarwarre Bennelong, a Wangal man, Bungaree, a man from the region of Broken Bay (who was probably Wannangini), and an Englishman Mathew Flinders. Ask any High School student and you will probably be told some story about them, but it isn't always accurate as history has a habit of twisting facts to fit the story. However, they are remembered.

Both Bennelong and Bungaree played important ambassadorial roles with the officers of the First Fleet and international visitors. Bennelong so impressed Governor Phillip with his knowledge and wisdom that Phillip took him to Britain, ostensibly to meet King George III. No official meeting ever took place although most history books claim otherwise. Bennelong returned to Port Jackson on HMS Reliance in 1795. Fellow passengers were Governor Hunter, ship's surgeon George Bass, and future navigator and cartographer Matthew Flinders. During the voyage Bennelong continued his role as an educator to the extent that Bass believed that he had learnt enough of the Aboriginal language to take him anywhere in the colony. Flinders later adopted Bennelong's recommendation to take an Aboriginal person with him to establish communication with local clans during his explorations. Nanbarry went first, Bungaree followed and became the first Australian to circumnavigate the continent.

Death united these three in a strange way. Bennelong died in 1813 and was buried on the land of emancipist brewer, James Squire. This grave site is shared with his wife Boorong, and Nanbarry, both of whom were members of the first stolen generation. No contemporary account of Bennelong's burial has been found and in time the location of the grave was 'lost' and a suburb grew over it. Flinders died in London in 1814 and was interred at St James's Church, Piccadilly. The cemetery was closed in 1853 and even then the location of his grave was 'lost'. The land became an urban park, then part of Euston Railway Station and more recently was required for construction of the high-speed rail. Bungaree died at Garden Island in 1830. Newspapers reported his death and promised an account of his funeral in Rose Bay in the next edition, but it was never printed and his grave site too was 'lost'.

United in life and united in death through 'lost' graves. However, in each case there was a faint paper trail and corrupted communal memory of where the graves were located. The paper trail included false leads but there was just enough in scattered records to narrow the sites down. Thanks to a surveyed map of Squire's property held by the State Library, a Letter to Editor

The Lost Graves of Bennelong, Bungaree and Flinders (cont.)

of the Sydney Morning Herald, found on Trove, and an early 20th Century snapshot of Bennelong's alleged grave, his final resting place was identified with some confidence in 2011. Two survey methods were used and both produced the same result. A preliminary GPR survey showed reflections consistent with a burial but no other investigations were undertaken. The news held international attention for a few days and was then bumped by other stories. In 2018, the property came on the market and the State was persuaded to buy it with the expectation that it would eventually become an interpreted memorial site. This too made news but to date nothing more has happened.

Construction of the high-speed rail in London involved exhumation of graves in what was left of St James's Gardens. Without knowing where Mathew Flinders lay there was a faint hope that he might be identified by coffin hardware and to the world's amazement this actually happened in January 2019, when a well-preserved lead coffin plate provided certain identification. Again, the news flew around the world, but this time it also triggered construction of a number of impressive memorials. A copy of one was installed at Flinders University in Adelaide.

That leaves Bungaree and the search for his resting place has yet to be undertaken. Community memory points to a particular part of Rose Bay and

it is very likely that he is not alone. There is almost certainly an archival record that could focus this search and there is another uncomfortable twist to the story. In 1857, the Australian Museum published a list of recent donations. It included "… a two-headed duck, portion of a mummy cloth …, numerous shells and minerals, a cast of the head of an idiot, and the Skull of King Bungaree, an Aboriginal of NSW". Today the Museum says "We haven't got it and don't know where it went".

In 1919, another chapter was written in the Daily Telegraph; two boys playing on the beach at Rose Bay unearthed a wooden box containing a skull in poor condition. It was found close to where we think Bungaree's grave is and some accounts say the box was packed with a copy of Bungaree's obituary – that has not been confirmed. How did this skull get to the Museum? Was it really Bungaree? How did it get into a box? What happened to it after the coroner apparently decided it was Aboriginal? Who was responsible for these disrespectful actions? Whatever the truth, the story is macabre, but unfortunately quite consistent with white-fella behaviour in the mid-nineteenth century. Very poor treatment of a great Australian whom Flinders praised so highly.

The grave sites of two of the three famous men have been located, only one, and he happens to be the white fella, has been sensitively memorialised. Isn't it time the others were shown the respect they deserve?

RESOURCES

Useful Mapping and GIS Links

No true geomorphic maps exist but general landscape and soil information is available. The best examples of such maps in NSW are the Quaternary Coastal Geology maps [1] or the Soil Landscape maps which depict landforms and their associated soils at scales which are just fine enough to begin to be useful. Interpretation of these is something of an 'art form'. None of the available maps provide specific information for any given location as all such maps are not a depiction of reality but an expression of a landscape model that was held in the mind of the map maker(s). Additionally, the maps are printed at a scale that is too coarse for site survey. Users should appreciate that map boundaries are not lines on the ground but simply mark the place where the map maker believed one unit could be differentiated from another. These points are important limits to the usefulness of maps that regrettably are not always understood by users and which can cause endless pointless argument, even in the Law Courts. The following links provide useful online National and State mapping and GIS resources and tools for geology, soils, vegetation, historical imagery and databases, among others.

National:

National Map https://nationalmap.gov.au/

Native title vision https://nntt.maps.arcgis.com/apps/webappviewer/index.html?id=d7aec94e0e204c48af7ef93b96160ba5

Elevation Data – Elvis https://elevation.fsdf.org.au/

Range of Interactive maps from Geoscience Australia http://maps.ga.gov.au/interactive-maps/#/

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1   Hashimoto T.R & Troedson A.L. 2008. Port Macquarie 1:100 000 and 1:25 000, Coastal Quaternary Geology Map Series. Geological Survey of New South Wales, Maitland.

RESOURCES

Useful Mapping and GIS Links (cont.)

New South Wales:

NSW Zoning/LGA data – ePlanning Spatial Viewer https://www.planningportal.nsw.gov.au/spatialviewer/#/find-a-property/address

NSW Environmental Data – SEED Spatial Portal https://geo.seed.nsw.gov.au/Public_Viewer/index.html?viewer=Public_Viewer&locale=en-AU

LGA Online mapping tools/Intramaps

Minview https://minview.geoscience.nsw.gov.au/#/?lon=148.5&lat=-32.50000&z=7&l=

eSPADE https://www.environment.nsw.gov.au/eSpade2Webapp

NSW Historical Imagery – Historical Imagery Viewer https://portal.spatial.nsw.gov.au/portal/apps/webappviewer/index.html?id=f7c215b873864d-44bccddda8075238cb

Interactive LALC map https://portal.spatial.nsw.gov.au/portal/apps/webappviewer/index.html?id=614b5c7afbbf473e83502e0be10e7228

Spatial viewer https://portal.spatial.nsw.gov.au/portal/apps/webappviewer/index.html?id=44e72c6c7ccf498cb1c822b740c647d3

Historic Lands Records viewer https://hlrv.nswlrs.com.au/

State Heritage Inventory https://www.hms.heritage.nsw.gov.au/App/Item/SearchHeritageItems?_ga=2.246634503.2091505574.1625708987-811974281.1588991214

RESOURCES

Useful Mapping and GIS Links (cont.)

Queensland:

Queensland Globe https://qldglobe.information.qld.gov.au/

Cultural heritage database https://culturalheritage.datsip.qld.gov.au/achris/public/public-registry/home

QImagery https://qimagery.information.qld.gov.au/

Spatial Data Portal https://qldspatial.information.qld.gov.au/catalogue/custom/index.page

Northern Territory:

NR Maps https://nrmaps.nt.gov.au/nrmaps.html

https://depws.nt.gov.au/land-resource-management/info-systems/natural-resource-maps/spatial-data-requests

RESOURCES

Useful Mapping and GIS Links (cont.)

South Australia:

Spatial Data Portal https://location.sa.gov.au/viewer/

SA Resources information gateway https://map.sarig.sa.gov.au/

Nature Maps http://spatialwebapps.environment.sa.gov.au/naturemaps/?locale=en-us&viewer=naturemaps

Plan SA https://sappa.plan.sa.gov.au/

Western Australia:

Spatial Data Portal https://data.wa.gov.au/

SLIP WA https://maps.slip.wa.gov.au/landgate/locate/

Plan WA https://espatial.dplh.wa.gov.au/PlanWA/Index.html?viewer=PlanWA

RESOURCES

Useful Mapping and GIS Links (cont.)

Aboriginal Heritage Inquiry System https://espatial.dplh.wa.gov.au/AHIS/index.html?viewer=AHIS

Victoria:

Mapshare - https://mapshare.vic.gov.au/mapsharevic/

Interactive Mapping - https://www.land.vic.gov.au/maps-and-spatial/maps/interactive-mapping-tools

Spatial Data Portal - https://www.land.vic.gov.au/maps-and-spatial

ACHRIS - https://achris.vic.gov.au/#/onlinemap

Tasmania:

Spatial Data Portal - https://maps.thelist.tas.gov.au/listmap/app/list/map and https://www.thelist.tas.gov.au/app/content/data/index#

CHAPTER THREE

GROUND-PENETRATING RADAR

and other non-invasive scientific tools for identify unmarked graves

There are several remote sensing (non-invasive) scientific methods available to community for identifying unmarked graves and cemeteries in a culturally appropriate way. Methods that you may commonly hear discussed include ground-penetrating radar (GPR), magnetometry (of which there are many and varied types), electromagnetic (EM) conductivity and electrical resistance survey. LiDAR (light detection and ranging) and drone imaging provide a way of mapping and sometimes identifying burial sites, and these methods are becoming cheaper and more accessible. With so many options, it can sometimes be difficult to know what the best method is to use for your circumstances. It is important to know that each method will be able to tell you something different and a method that may be suitable in one context, may not be suitable in another. Here we will focus on ground-penetrating radar (GPR) as the most used and useful tool in our remote sensing toolkit for the identification of unmarked graves, because it can be used on a wide variety of ground conditions and produces accurate and precise three-dimensional images of what is buried in the upper 2-3 meters of the soil.

Computer control unit

Distance measuring wheel

400 MHz antennas

Ground-penetrating radar system, this one is a GSSI SIR-3000 system with 400 MHz antennas mounted on the "baby jogger" cart being used at Coraki Cemetery, on Bandjalang country, NSW (Source: Virtus Heritage).

Ground-penetrating Radar (GPR)

Ground-penetrating radar (GPR) transmits radar waves from surface antennas into the ground that reflect off buried features. In only a very few unusual cases has GPR been able to detect actual human remains. What usually indicates the presence of burials are faint differences in the natural stratigraphy of the ground where a grave shaft has been dug, and the burial goods, coffins or caskets associated with burials. If the burials are very old, the ground disturbance and/or faint reflections from burial goods may be the only direct indication of a burial.

GPR surveys can find burials and associated features at depths from a few tens of centimetres up to 2-3 meters in depth with the right ground conditions. GPR results are most reliable when there are nearby known graves (perhaps with surface markers in a cemetery) that can be used as "models" for what burials look like in the local ground. However, even if there are no known burials nearby, they can be identified by their predicted size and shape, which is dependant on the burial position (e.g. extended, flexed, sitting or bundled – all of which were used in Australia), and size of the human (adult, child or infant). This is when information from relevant archaeological investigations, historical and ethnohistorical accounts and/or oral history from the region can provide useful context for interpretation. Careful analysis of GPR data in three-dimensions can identify these burials with confidence when they are the size and shape of human burials, and cultural contextual information plays an important role in this.

The site context including soil and sediment mineralogy, clay content, ground moisture, surface topography, vegetation and of course the depth and condition of the burial, influence our interpretation of GPR data. For example, within sites where the ground is predominantly sand, such as dunes, the sediment surrounding burials will effectively be invisible, and any reflections identified with GPR will be from buried objects or features. It is the specialist's job to work out whether the reflections are from natural features or whether they represent cultural features, such as burials. In sites with more complex stratigraphy (soil layers), such as river terraces, the interpretation of GPR data can be complicated by the large number of reflections from these natural layers, which may mask important cultural reflections. Even with this complexity, the size and shape of human burials will still be visible and can be differentiated from the natural layering.

HOW DOES GPR WORK?

Ground-penetrating radar (GPR) is an active method that transmits electromagnetic pulses (radar waves) from surface antennas into the ground, and then measures the time elapsed until the pulses are received back at the surface. Radar travel times are measured in nanoseconds, which are billionths of a second.

GPR data are collected as reflections of the transmitted radar waves off buried features (including the boundary between two different materials) in a similar way that radar is used to detect airplanes in the sky, except that GPR energy is transmitted into the ground. Some reflected radar waves will travel back to the ground surface and receiving antenna, while the remaining energy continues to spread downward and outward and can be reflected again and again from additional buried features until all the energy finally disperses with depth (called attenuation). Only the reflected energy that travels back to the surface antenna is recorded and can be interpreted.

The amplitude (that is the strength) of the reflected radar waves are also important because their relative variations are directly related to changes in the physical and chemical properties of different materials in the ground. The velocity (speed) of traveling radar waves will also vary, depending on the physical and chemical properties of the materials in the ground. Accurate depths of buried features can be calculated by the measured travel times of reflections and velocities of the radar energy transmission in the ground.
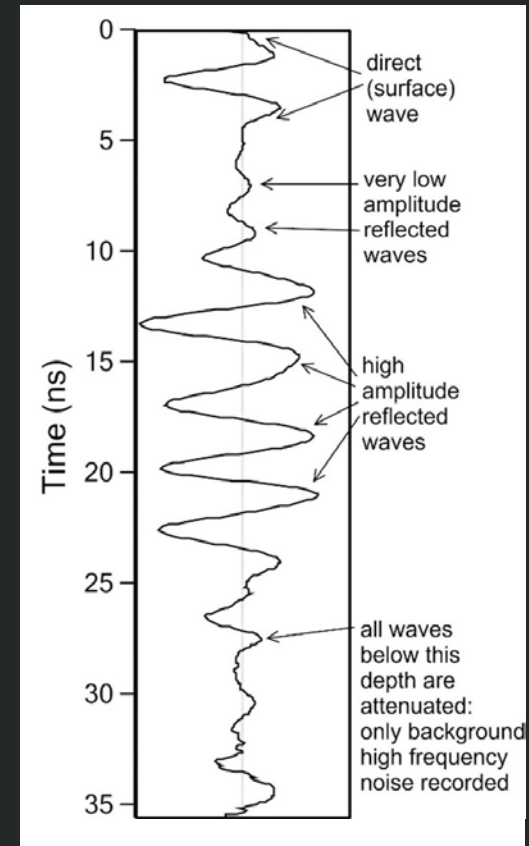
One reflection trace collected over a 35 nanosecond time window showing reflections from one spot on the ground surface.

The GPR antennas are typically moved along lines (called survey transects) within a survey grid so that the exact location of where the reflected data were collected is known and can be plotted on a map. Distance along transects is measured using a survey wheel attached to the antennas. As the antennas are moved along the ground surface, individual reflections are recorded about every 2 to 10 cm along each parallel survey transect (normally spaced between 25-50cm apart). The structure of each reflected radar wave (called a waveform) that is received by the GPR computer system are digitised into what is called a reflection trace, which is a series of waves reflected back to one surface location from many depths in the ground.

When many traces are stacked next to each other sequentially, a two-dimensional vertical profile is produced along the survey transect which produces two-dimensional images, just like viewing layers in a vertical road-cut or excavation section. When many two-dimensional reflection profiles (each of which contain thousands of reflection traces) are collected within a grid, we can use these data to produce a variety of both two and three-dimensional images that allow us to interpret objects and features in the ground using various software. One of the main image types that GPR specialists produce are called amplitude maps, which are two-dimensional maps of the grid showing the different strength (amplitudes) of reflections at a variety of chosen horizontal depths. Amplitude maps are just one step in helping interpret GPR data.
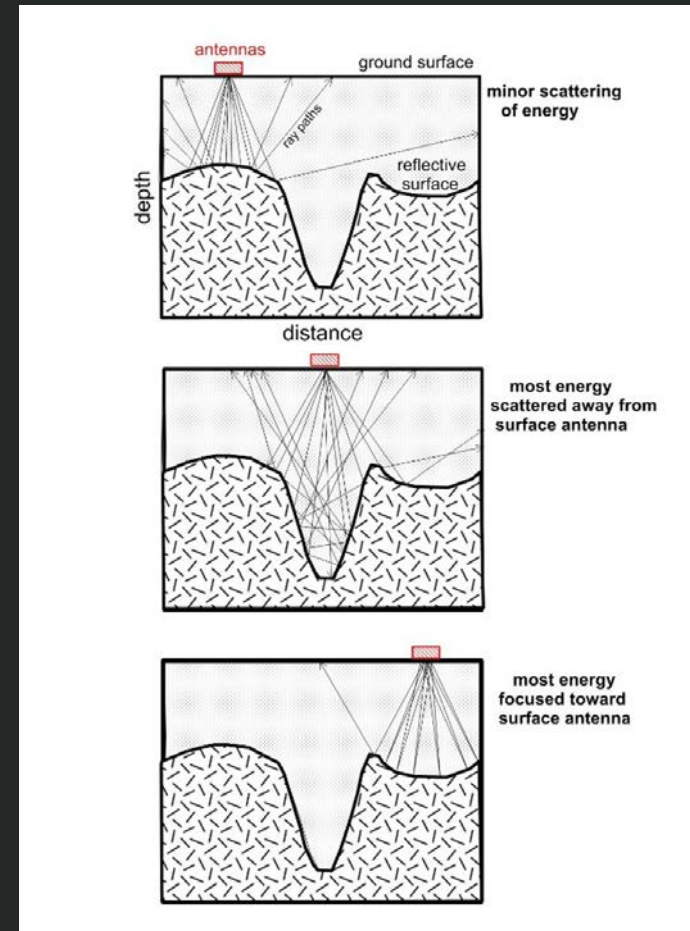
These images show how radar waves are reflected off a buried discontinuity where they are scattered, focused or just lost, depending on the geometry of that surface.
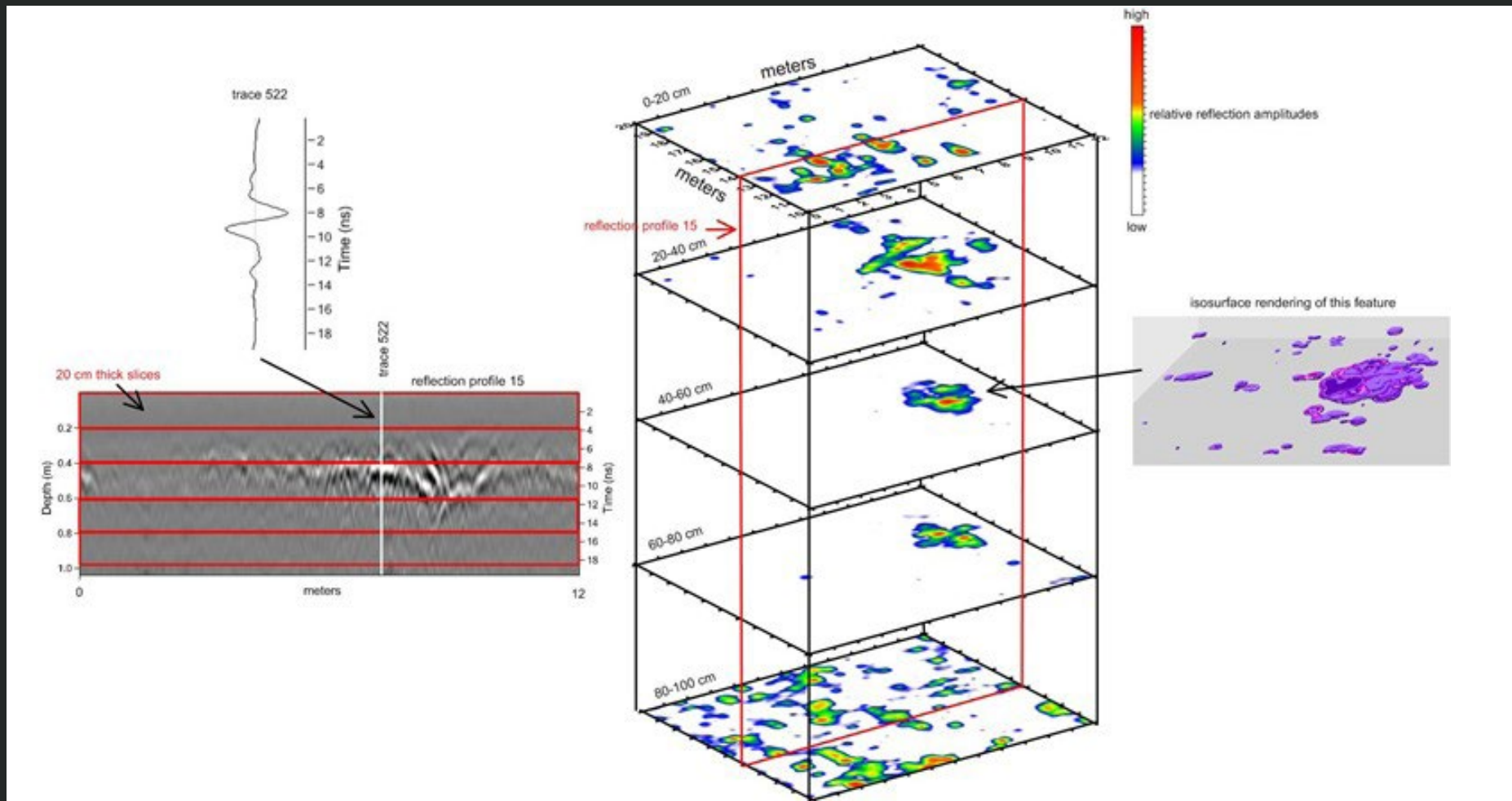
Many traces are compiled into one reflection profile, and then many profiles in a grid are sliced into discrete layers (shown in red on the left). The relative reflection amplitudes are then gridded and displayed into horizontal layers (in this case every 20 cm depth) where features can be viewed. The three-dimensional isosurface (model) of the larger feature is then shown in purple on the right as an additional display.

GPR and the Identification of Burial Types

As we have already discussed, Aboriginal and Torres Strait Islander burials can be found in many different contexts including cremated and uncremated remains in "formal" post-contact/historic cemeteries, "informal" traditional cemeteries or burial grounds, mounds and middens, massacre sites and mass graves, isolated burials, and burials associated with other sites such as rockshelters and trees. Importantly, formal cemeteries can be found in places where Aboriginal and Torres Strait Islander people also traditionally buried their families, and where traditional and European-style burial practices can be found in the same place. Also, traditional burial practices sometimes continued to be used in the post-contact period. This reflects cultural resilience and the continuity of cultural practices in the way that Aboriginal and Torres Strait Islander people buried their ancestors and/or returned to traditional burial grounds, even after European invasion. GPR can assist in identifying a variety of traditional and European-style burials within a number of ground types, which are discussed below.

Sites may need to be cleared of some vegetation prior to GPR survey (Source: C. Jennings).

Formal (historic) Cemeteries

Aboriginal and Torres Strait Islander graves are sometimes found in formal cemeteries dedicated solely to these communities, or sometimes in reserved sections within larger cemeteries that contain burials from many different communities and religions. The collection of GPR data from formal cemeteries is normally relatively easy as the ground is often flat and generally mown and gardens well maintained and burials with coffins or caskets, are generally easy to identify with GPR. The trade off in some formal cemeteries is that headstones, monuments, fences, and a variety of other obstructions at or near the ground surface can complicate collection procedures where antennas must be moved around these obstacles. Other challenges include the variation in burial types, which can be small "targets" for GPR (particularly in the case of cremated remains), relative to soil layers they are found in. Additionally, not all burial plots will contain the expected interment and the great age of some of the burials (that leads to decomposition), means they cannot be easily identified with GPR, if there is no coffin, casket or associated burial goods, an issue that is commonly encountered within all burial contexts.


At Baryulgil Aboriginal Cemetery NSW multiple GPR grids were established to avoid the surface gravestones, fences and ornaments, typical of historic cemeteries (Source: E. St Pierre).

Particularly noteworthy is that contrary to what you might think, the depth of burials in formal cemeteries can vary greatly. Depending on the time of year, grave diggers might have expended more (or less) labour in digging a burial shaft. Children or infants were often not buried as deeply as adults, and sometimes, sadly, are found as "stacked" graves where two or more individuals were buried in the same shaft to save time, money or space. Typically, grave shafts in European-style burials were supposed to have been dug to a depth of 6 feet (about 2 meters) but after caskets were placed in the shafts, the upper surface of the casket that reflects most of the transmitted GPR energy is often seen at between 1.2-1.5 meters below the ground surface, or even shallower, depending on the excavator and ground conditions.
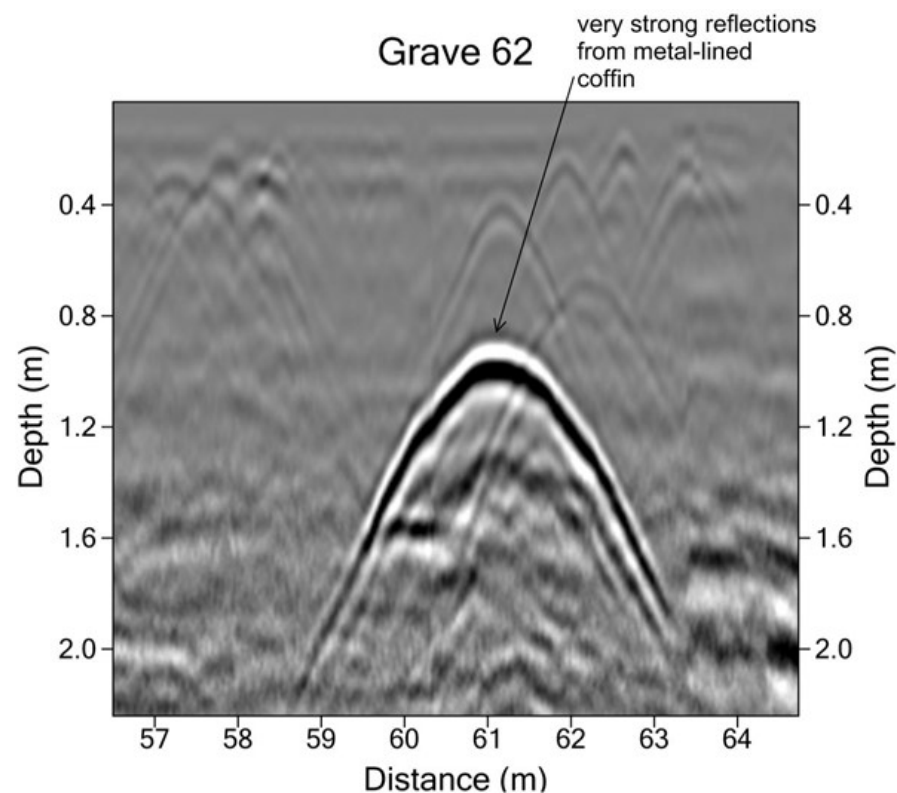
A 2-dimensional vertical reflection profile. The hyperbola (arch shapes seen in this image) are the energy waves reflecting of objects in the ground. This hyperbola shows very high amplitude reflections generated from a metal coffin, or a coffin that is lined with metal. No human remains have generated reflections here.
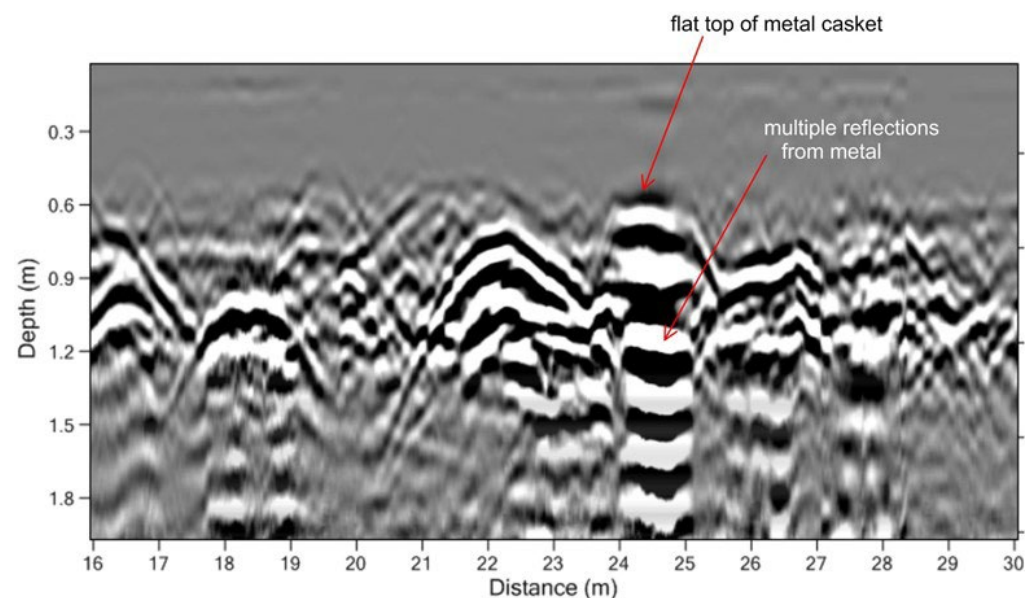

A metal casket that shows multiple reflections that "ring" through the reflection profile because metal is a perfect radar reflection surface. The waves that hit the metal have generated an electrical field in the ground, which then resonates waves back to the surface to be recorded, producing this type of distinct reflection feature. No human remains have generated reflections here.

You might wonder why GPR within a formal cemetery is required. Sometimes cemetery owners have lost records of burials and are unsure of where new graves can be excavated so that they can inter the recently deceased. In the case of Aboriginal and Torres Strait Islander cemeteries, as we have seen, these were predominantly not gazetted prior to 1967 and records are frequently missing entirely. In other cases, graves were intentionally positioned in out of the way places, with little documentation, usually because of a lack of funds for proper burials of the unfortunate people who had no family to bury them or wealth to provide more elaborate burials. Sometimes graves that may have had head stones and other surface markers, have been re/moved due to erosion, vandalism and general neglect. Additionally, some Aboriginal and Torres Strait Islander cemeteries are located in traditional burial grounds with no markers or records to indicate traditional burials. GPR, therefore provides a useful way of identifying the exact location of these unmarked graves without having to excavate, which is a time consuming and destructive method, and can be traumatising for family members and communities.

GPR can also tell us a good deal about different burial practices, which in turn can help determine the relative age of a burial. Casket or coffin burials that have not weathered and collapsed will retain void spaces and those air pockets can often be identified in reflection profiles by studying the polarity of the radar waves. Recently buried caskets that still contain void spaces can often be differentiated from those that have collapsed and filled with sediment. Metal, which reflects all radar energy, produces multiple strong reflections, and caskets that are lined with metal (such as older lead-lined caskets) or those that are composed of entirely of metal, produce distinctive reflections.

Older cemeteries where caskets have collapsed, and human remains are mostly decomposed, present a number of challenges with GPR. Sometimes very low amplitude (weak) reflections are visible from these very old remains. If all human remains and burial goods have decomposed the only features still present are the vertical shafts and sometimes the subtle settling of the surface soils into the shafts. This type of burial feature is very common in historic cemeteries around the world where simple wooden coffins were used and then collapsed and deteriorated soon after burial.
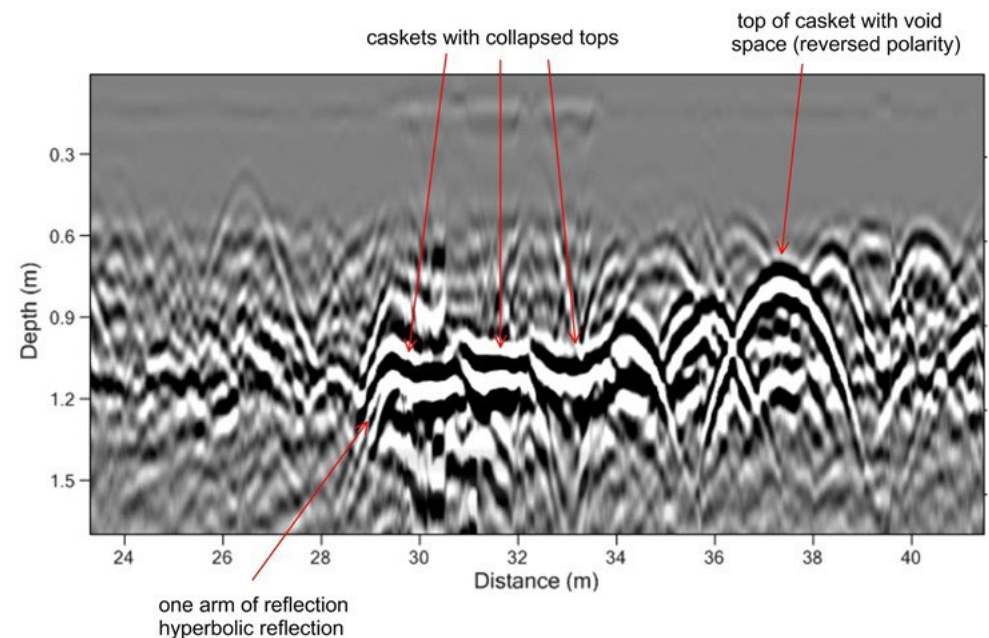
A reflection profile showing the sagging tops of partially collapsed coffins, with an intact coffin on the right. The coffin on the right displays a black reflection first (reversed polarity) that indicates it contains a void space. Those clustered between 28 and 35 meters are collapsed and likely filled with sediment, and have no void spaces within them. No human remains have generated reflections here.

Grave 39

top and bottom both reflective
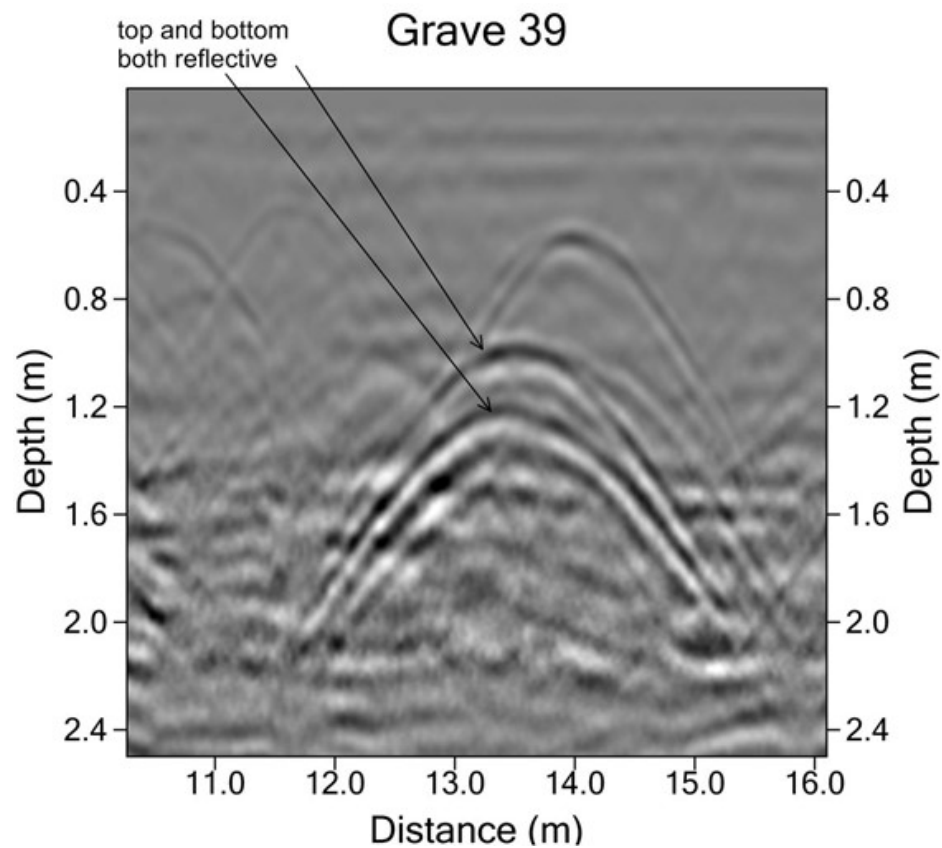
A casket that displays reflections from both the top and the bottom. The slight depressions that remain on the surface as a result of subsidence may be detectable with Lidar, and even drone imagery in some cases. No human remains have generated reflections here.

settled surface soils due to casket collapse

150 year old burials: collapsed coffin tops
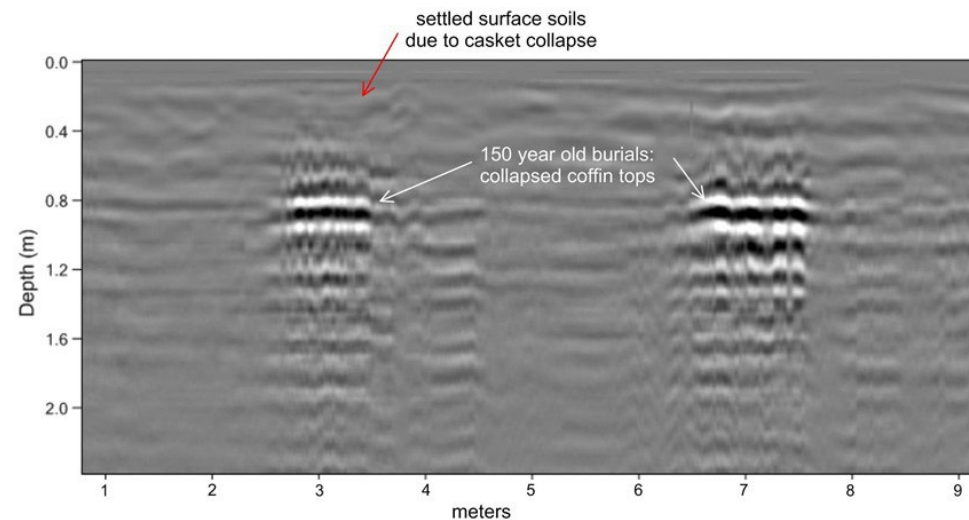
Collapsed wooden coffins in this profile show only a flat layer in the ground. No human remains have generated reflections here.
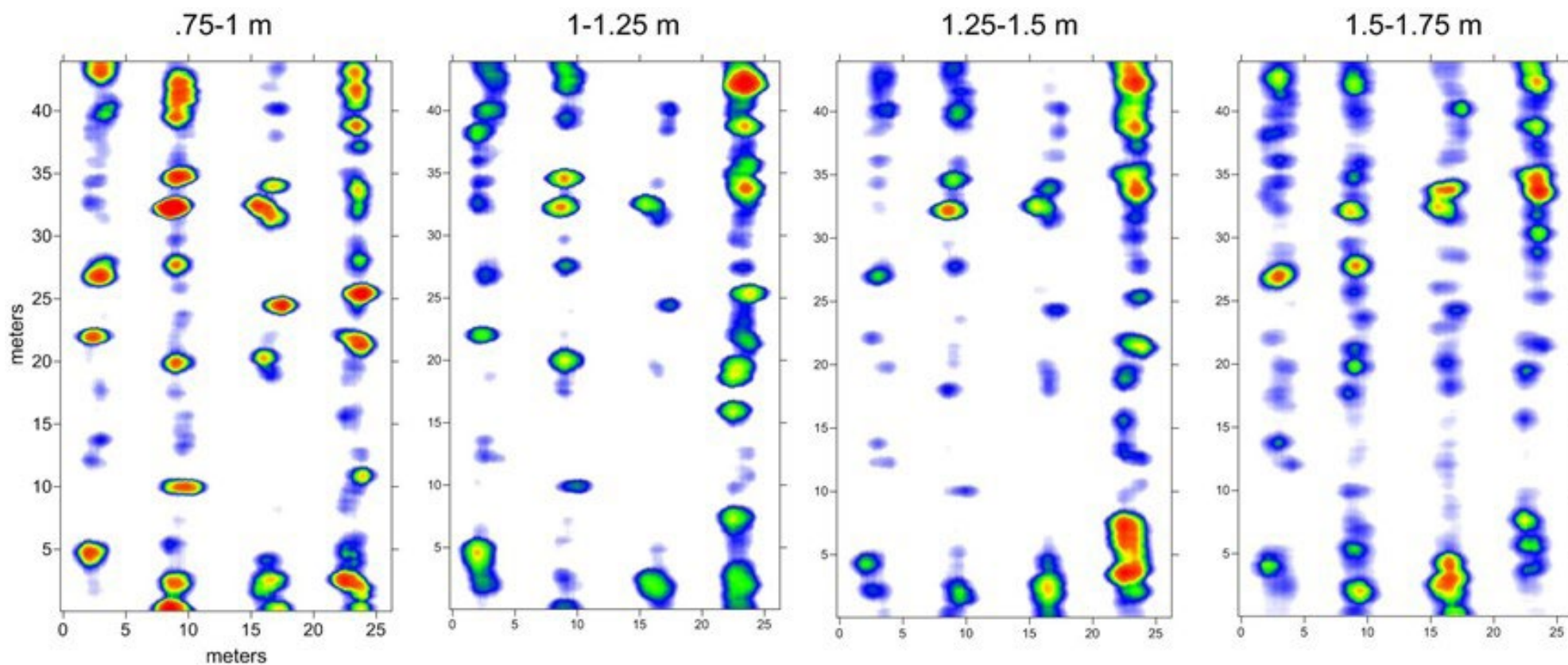
Formal cemetery with rows of graves show distinct reflections from various depths in a very orderly image. No human remains have generated reflections here.

CASE STUDY
Fingal Cemetery, NSW

Fingal and its headland on the north coast of NSW, is not only beautiful coastal country of the Bundjalung Nation, but also a highly significant cultural landscape with important archaeological sites and dreaming stories. The Aboriginal and South Sea Islander Cemetery at Fingal was used historically to bury family members from these communities. However, the site is also well known to have been used traditionally by Bundjalung families as a burial ground prior to European invasion. A number of headstones and grave markers are present at the site. In 2015, a GPR survey showed that many more graves were present within the burial ground than were marked, just as oral history had already indicated, and some of these appeared to be traditional burials[1].

The GPR survey also showed that several burials were located along the fence line bordering the cemetery and the adjoining caravan park.

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1   Conyers, L. 2015. Short Report on Ground-penetrating Radar Mapping, Fingal Aboriginal Cemetery, New South Wales, Australia. Unpublished report to Virtus Heritage Pty Limited and Tweed-Byron LALC.

CASE STUDY

Fingal Cemetery, NSW (cont.)

Part of the Fingal area was historically mined for mineral sand, and the development of the caravan park and associated infrastructure such as water pipes (which could also be identified with GPR within the cemetery), has greatly impacted the area. It is undoubtable that the cemetery shows continuity of cultural use as a burial place from the beforetime. Not only do the burial grounds extend beyond the current arbitrary boundaries of the cemetery, but it is likely that many graves have been damaged or destroyed because of historical impacts including sand mining and the construction of the caravan park. The Fingal Aboriginal and South Sea Islander cemetery is an example of how historical Aboriginal and Torres Strait Islander cemeteries may be found on traditional burial grounds, demonstrating continuity of cultural practices and returning to place. The cemetery is also an example of how inappropriate development and land tenure have real consequences for the protection or destruction of the resting places of Aboriginal and Torres Strait Islander ancestors, with little regard for the impact this has on surviving family members and community, and their responsibility to those gone before.

# Traditional Burial Grounds and Isolated Burials

Older traditional Aboriginal and Torres Strait Islander burials can be very difficult to identify with GPR. Generally, very little evidence remains of these burials, and we need to carefully examine reflection profiles to look for changes in horizontal layering of the ground that might indicate a burial shaft or pits, or weak (low amplitude) reflections associated with burial goods (or in very rare cases human remains). Traditional burials have been identified within historic cemeteries as clusters of reflection hyperbolas, which denote the location of buried objects. When these single reflections are visible, it is never a good idea to place "x marks the spot" unless similar reflections are visible in adjacent profiles that can delineate the total size and orientation of these objects. In this way only the objects that are the dimensions of human burials (which can vary depending on the burial type), at the appropriate depth in the ground, and which can be examined in a variety of imaging procedures, should be identified as potential burials. Surface markers of these traditional burials are often lacking or relatively ephemeral (small stones, shells, coral or other items) and can be scattered by animals or general neglect over many years. Due to the difficulty in positively identifying traditional burials, where other evidence is not present (e.g. oral history, burial markers etc.) it is prudent to identify these buried objects as potential burials only, even when they appear to fit the criteria for a human burial.

Sometimes very old informal burials are marked with surface stones, pieces of coral or other items, such as the burial here at Mapoon Mission Cemetery, QLD (Source: M.Sutton).

Mass Graves and Massacre Sites

To date no Aboriginal and Torres Strait Islander mass graves and massacre sites have been identified with GPR in Australia. This is because knowledge of the exact locations of these sites have frequently remained hidden or have been lost. Where the general locality of massacre sites may be known, rarely does evidence of the actual event remain, and we generally have very little information about what happened to the deceased after the event. There are reports that GPR has been used to identify mass graves from more recent conflict zones such as in El Salvador, Bosnia and Iraq. These have not been published, but the scientists who conducted these surveys have indicated that much of what can be seen in GPR reflection profiles are large pits, sometimes with point source hyperbolic reflections from objects within them. The point source reflections were generated by human remains or artefacts of various sorts that were associated with the remains or thrown in the pits, such as personal items.
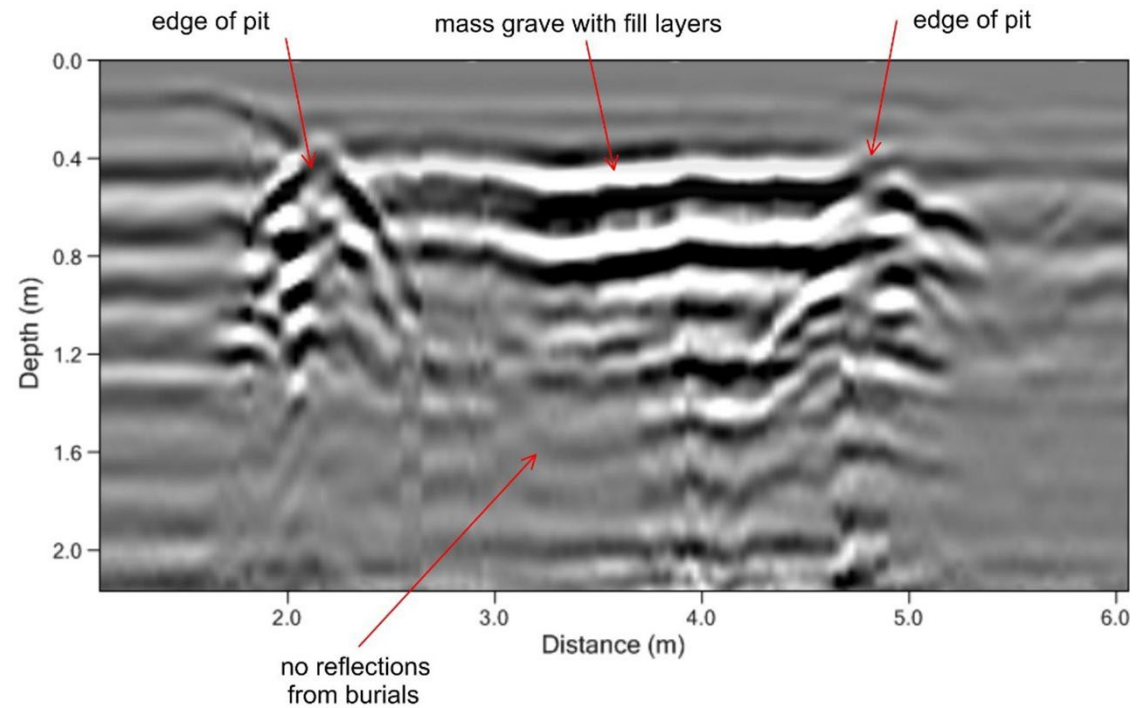
A GPR reflection profile of a mass grave cut, showing distinct pit edges and layers that filled in the incision.

Mounds and Middens

Burials are known to be found in mounds and middens, both at coastal and inland sites. Sometimes these burials are cremated remains. Burial mounds come in various sizes (some very low to be almost unnoticeable in the landscape, to mounds up to 3 m high), and shapes (round, oval, semi-circular or crescent), and are known from across the entire Australian continent. GPR has been successfully used to identify both traditional and casket burials within mounds, in the same way they have been within cemeteries and burial grounds. Sand mounds in Mapoon, Northern Queensland containing burials from the contact period as well as traditional burials are a good example of this. In these types of sites, topographical corrections for the changes in elevation of the mound are done by using traditional surveying methods (such as a theodolite or dumpy level), high accuracy GPS (real time kinematic or RTK GPS) or creating a digital elevation model (DEM) through drone imagery or LiDAR. The correction of radar reflections for elevation, allows for accurate interpretation of the results, including their actual depth. GPR can also tell us about how these features were constructed, by showing different stratigraphic layers and other structural features within the mounds and middens.

Two mounds from a group of three on Cullen Point, Mapoon, Queensland. Numerous traditional burials were identified with GPR in these mounds. Several mounds in this area also had 'European style' burials within them and were known to be used historically as burial places (Source: E. St Pierre).

FILE122.DZT

organized graves in a row
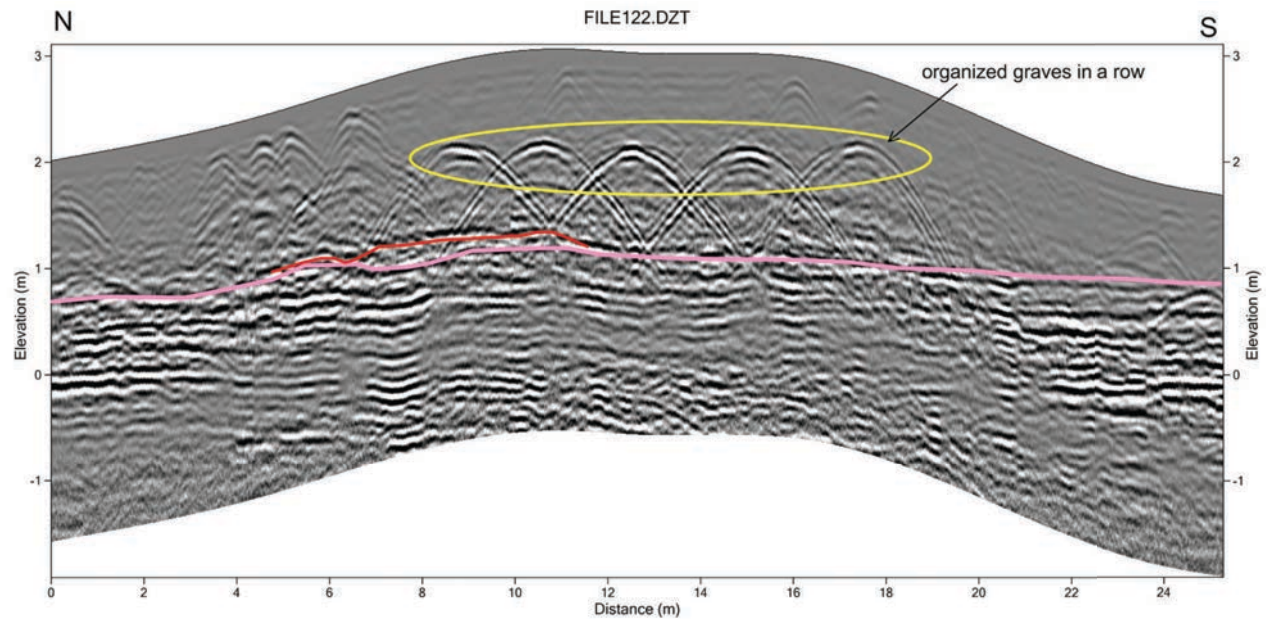
This burial mound on Cullen Point, Mapoon, Queensland, contained five coffin burials in an orderly row, seen in this GPR profile as hyperbolic reflections from the top of the coffins. This is one example of the occurrence of continuity of burial practices and use of traditional locations for burials in Aboriginal and Torres Strait Islander society, even after European invasion.

BURIAL PLACE OF THE LAST OF THE NATIVE KINGS AT WALLERAWANG.

Burial Place of the Last of the Native Kings of Wallerawang. Note the presence of two or three carved trees facing the grave (Source: Hunter Living Histories website accessed 27 July 2021).

Limitations of GPR

There are a number of limitations to the GPR method, some of which are unavoidable and some of which can be controlled. These include but are not limited to:

- External noise interference from radio transmissions and mobile phone communication that overlap with the GPR antenna bandwidth can mask the GPR data. Some of these issues can be avoided by not using mobile phones when conducting surveys and by filtering certain frequencies of background radio transmissions from the recorded data.

- Variability in ground conditions, compaction and water saturation, types of sediments (particularly certain types of clays) and the presence of salt, nitrates, calcium carbonate and calcium sulphate (gypsum) and other chemical fertilisers when in solution (dissolved in water in the soil) which can impact the depth of radar energy penetration.

- Surface conditions including large rocks or other near surface objects, such as tree roots, and surface water can also impact data quality as they can scatter radar energy and reduce the depth of energy penetration.

- GPR is not particularly useful on very steep slopes or vertical inclines and can only be usefully used in areas that are relatively free of vegetation and not affected by potholes or deep ruts (e.g., newly ploughed fields), as this can cause problems with coupling the transmitted radar waves with the ground to allow transmission to depth (which in turn impacts data quality).

- The main thing to keep in mind is that GPR will rarely be able to identify human remains themselves (particularly those of great antiquity), and more regularly relies on identifying grave cuts, disturbances to the soil profiles, caskets and coffins, and other material remains interred with the deceased. In these cases, "models" for what a known burial within the area of interest looks like with GPR are highly valuable. Therefore, Aboriginal and Torres Strait Islander communities that have undertaken GPR in similar soils and landscape contexts will have 'models' that can assist other communities to identify their ancestor's resting places and this knowledge is important to share, where culturally appropriate.

WHAT TO EXPECT FROM YOUR SPECIALIST

It is always important when choosing a GPR specialist to look at that person's previous reports and look at not just their results, but more importantly, the methods they used to get those results. In relation to data collection methods, these two questions must be addressed to determine if a specialist has the knowledge and experienced for the proposed project:

- <u>What antennas were used in past surveys?</u> If they were too low in frequency (lower than about 300 MHz), then the specialist likely only had antennas available that are useful for geological or ground water analysis, as these frequencies will not allow burials to be detected. If too high (greater than 600 MHz) then the same type of critique applies, but in this case the radar energy from those antennas would not likely have been transmitted deep enough to reflect from most burials. A lack of understanding of antenna frequency may suggest a lack of experience in GPR data collection for the purpose of identifying burials, or someone who does not have the equipment necessary for the project.

- <u>How were the transects collected in a grid?</u> If the specialist proposed greater than 50 cm transect spacing, the results obtained will unlikely be able to determine the spatial extent of reflections necessary to determine if those reflection features are burials. For example, if transects cross an extended burial at a right angle, and the burial is about 1.5 meters in length, three parallel transects in a grid are optimum to "see" a burial of that length. With a 50 cm spacing at least two of the transects would always image a burial of this length.   However, if transects were spaced at 1 meter, then it is possible that only one (or less-likely two) reflection profiles might "see" a burial, which is not enough spatial resolution to make burials visible. Two transects at a bare minimum must produce an image of a burial to be categorized as "probable". One is not enough.

In relation to data analysis methods, different levels of analysis are required depending on the type of site and the complexity of the ground. Some sites require detailed and time-consuming analysis if the ground is "complicated" with stones, tree roots and a variety of geological units. A specialist with geological knowledge as well as geophysical experience is therefore, necessary in order to interpret ground of this sort that might contain a dizzying array of reflections, only a few of which are cultural. This is particularly the case for traditional burial sites that are very difficult to identify with GPR due to their deterioration over a long time. Regardless, no matter how complex the geological setting there are important aspects of data analysis and interpretation that a GPR specialist should use, which will guarantee the most reliable interpretation possible.

Never trust results that only discuss "anomalies" that might be seen in GPR amplitude maps or profiles. Anomaly is a meaningless term in GPR, as all GPR reflections by definition are anomalies generated by changes in the ground. "Anomaly picking" is a lazy way to show the location of stones, roots, discontinuities in geological layers, animal burrows and many other features. In order, to differentiate all that might be "visible" in the ground, a specialist must show the ability to differentiate all these objects and features and other possible changes in the ground using spatial analysis from a variety of visualisation software. If the features that have been interpreted as burials in a report cannot be demonstrated to be the size, shape, orientation and depth consistent with burials, then that specialist either has a limited knowledge of GPR software, is not taking into account the complexity of the ground or has limited experience in interpreting complex three-dimensional datasets.

Often a combination of visual displays is necessary to adequately interpret GPR data in grids. Reflection profiles provide good two-dimensional visual displays of the ground in a vertical slice. Once depth has been determined, these displays can show many reflections generated from possible graves (or a variety of other "point-source" objects such as rocks or roots for example). A specialist must have the ability to interpret these displays correctly, and then compare reflections in two-dimensions to the three-dimensional displays such as horizontal amplitude maps of the whole grid.

The specialist must show the ability to move between multiple displays to visualise possible graves in a profile and map-view to show their size, orientation and depth. This often requires a manual interpretation of individual profiles, which is time-consuming but a necessity to identify the older graves. Any specialist who claims that there is software available that can "automatically" create images of graves in the ground without a manual/visual analysis of individual reflection features in profile either has limited experience in GPR analysis or is not prepared to spend the time and effort necessary to provide the most complete and reliable results.

Your specialist should be able to explain in clear terms what they are describing when identifying a burial or potential burial. Is it a casket? Associated burial goods? A burial shaft alone? Or a combination of burial types and features? Always remember that unless the burial is recent and very shallow, it is very unlikely that actual human remains will be identifiable in radar reflections. But many of the associated burial features discussed above are good indications of burials.

Other Remote-Sensing Tools

A number of other remote-sensing methods are sometimes discussed as tools for identifying or assisting in the identification of unmarked graves. Some of these tools, such as drone imagery and LiDAR are very useful for mapping landscapes and providing spatial data to assist in mapping the GPR data. Other tools such as magnetometry, on their own are not particularly useful, but can provide supporting evidence in the attempt to identify unmarked graves. Some of these methods are presented below.

Drone Imagery, Photogrammetry and Digital Elevation Models (DEM)

Drones, also known as UAVs (Unmanned Aerial Vehicles), carry cameras that can be used to obtain current, high-resolution images and video of the land from above. Drones are used to take a series of photographs to lay on a map). These images can be used to provide detailed overviews of land where satellite imagery may be unavailable or of poor resolution. The same process used to produce aerial photographs can also be used to create a coloured digital elevation model (DEM), to aid in the identification of features that may not be obvious in photographs or even when inspected at ground level. For example, features such as mounds or depressions indicating subsidence associated with an unmarked burials can be identified in this manner. A drone can also be programmed to take overlapping photographs as it flies an automatic flight pattern. These photographs can then be combined using photogrammetry software to create a three-dimensional model of the topography and other features.

Drone takes off to survey a post-contact cemetery at Mapoon, Queensland that has both marked and unmarked burials (Source: C. Jennings).

LiDAR

LiDAR (Light Detection and Ranging) is a remote sensing method that uses pulses of near-infrared laser light from an aerial vehicle (airplane, helicopter or drone) to measure ranges (variable distances) to the ground surface. These light pulses (as well as other spatial data) generate precise, three-dimensional information about the shape of the Earth and its surface. This method allows for the examination of surface characteristics, both natural and artificial, over broad areas (landscape level), with amazing accuracy. LiDAR can be used to make digital elevation models and to see features that may be hidden, for example by vegetation, or that cannot be discerned from the ground or by traditional aerial photography. In this way LiDAR can be used to identify mortuary landscapes with features such as burial mounds and can be a useful way to analyse areas at a landscape scale .

Magnetometry

This geophysical tool measures changes in the earth's magnetic field by looking at materials in the ground that are either magnetic or have magnetic susceptibility (can be slightly polarized by the earth's electrical field). This method is useful up to a depth of 2 metres and allow two-dimensional mapping of data. The method is very efficient at collecting a large amount of data over a large area but has limited ability to determine the depth of the features, objects or geological changes identified through analysis. In the context of mapping geological changes, buried archaeological features and human burials, it has limited use unless the features of interest are magnetic. Iron objects or burned ground (e.g. such as hearths) show up very well as highly magnetic areas during analysis and sometimes organ-

ic-rich units can be defined as very weakly magnetic. When combined with GPR, which has very good three-dimensional abilities, magnetic mapping can be useful for providing information on the chemical and physical characteristics of features identified with GPR. If graves are the target of the survey, magnetometry can potentially show where there are remaining materials that have some iron, such as coffin handles, nails or other fittings. It may also have the ability to image higher organic matter in the burial shafts, but this has not been well documented. However, when the goal is to identify burials, magnetometry is generally only useful as a method to support and add information to GPR results.

Magnetometry survey of a burial mound in Mapoon, Queensland (Source: E. St Pierre).

Electrical Resistivity

This near-surface method induces an electrical current into the ground, which travels between surface electrodes (metal probes), often traveling to 2-3 meters depth during its propagation. The electrodes are placed in the ground (up to 30cm deep) and are spaced at various distances and orientations depending on the depths of interest. The readings at any one location may measure the electrical resistance of the materials in the ground. It is a relatively slow method of data collection, as electrodes must be forced into the ground, a measurement taken, and then the system move to the next location, perhaps only 50cm away. Each electrode must then be pushed into the ground again and the collection procedure repeated over and over along surface transects. Depending on the surface electrode configuration it has an ability to define depth of the readings, which is termed electrical resistance tomography. Soils that are wet or slightly saline and therefore highly conductive to electrical currents are the most suitable for this method. It does not work at all well in dry soils which are very common in Australia. For graves it can potentially show changes in the types of materials in the ground, but it has not been used in any well-documented way to define relatively small features such as human burials, which can often be subtle as well.

Electromagnetic Conductivity

Electromagnetic (EM) conductivity instruments are simple and reasonably cheap, hand carried devices that measure an electric field set up in different materials in the soil, when an electromagnetic field is passed into the ground by a transmitter coil and secondary currents are created in buried conductive material. The secondary currents are measured by a spatially distant receiving coil, which gives a proxy measurement of both electrical and magnetic properties of the ground. Two models are widely used in soil and groundwater survey the EM38 and the EM31 both manufactured by Geonics Ltd. The EM31 is a longer and heavier unit that can be tiring to carry although in cleared ground it can be mounted on a quad bike and does have deeper ground penetration capability (about 6m). The EM38 has an inter-coil spacing of only 1m and is only effective to a depth of about 1.5 m but it is a much smaller and lighter unit that is adequate for most burial surveys. EM meters are sensitive to temperature fluctuations and the presence of metal objects carried by the operator and from nearby electrical sources such as power lines. They operate well over a wide range of soil moisture conditions and the smaller instrument can also be used to measure soil magnetic susceptibility which may detect burned ground such as hearths. In particular situations, where burials are suspected such as in acid sulphate soils, use of an EM meter may be rewarding.

CHAPTER FOUR

ENVIRONMENTAL MANAGEMENT TOOLS

To interpret, manage and protect unmarked graves and cemeteries

There are numerous scenarios and possible management tools and options, in fact too many to capture in this document, for the protection of unmarked graves and cemeteries. This chapter provides an approach to identifying the threats and selecting an appropriate management response. A selection of typical management options are included which could be relevant in various situations.

In identifying what may be achievable in a particular situation it is important to consider the following to ensure the outcomes are successful:

- **Can it be saved?** In some cases, the threat may be so severe that it is not possible to save the site. For example, dramatic coastal erosion from climate change may be one such threat. In this case alternative measures may be required such as salvage, relocation or recording.

- **What will work? T**here are numerous options available, and it is important to ensure that the selected approach will work.

- **Is it cost effective?** In other words, does the outcome match the cost? Some options can be very costly to implement and maintain and it is not practical to select these if the funding is not available or sustainable in the long term.

- **Is it practical and can it be implemented?** The management options must be easy to implement otherwise they are likely to fail in the long term. It is important to determine what can be achieved with the resources (people and funding) available.

Understand the Context

In understanding the threats and identifying management options it is important to establish the following:

- **Who owns the land?** Aboriginal and Torres Strait Islander communities are the rightful owners of their country. However, unless there is an approved native title claim and tenure has been rectified and granted, the legal landowner is often not the Aboriginal or Torres Strait Islander community. Agreement with the legal landowner is critical to achieving a successful outcome in terms of existing and future land use, as well as access for management and they may be responsible for funding activities that can assist with management.

- **Who has an interest in the land?** Other interested parties could include those that have some form of access to the land and therefore could either hinder or assist with management. These parties could include the general public, Native Title claimants and mining companies (active or proposed mines and exploration leases) or government agencies.

- **Are there existing management processes already in place?** Where there are existing processes any proposed additional measures should complement these to avoid unnecessary duplication of effort. Existing processes could include local council management plans, weed / pest control programs, or cultural heritage management plans.

- **Are there legislative requirements that need to be considered?** Some places may be protected by heritage (e.g., Indigenous or non-Indigenous heritage registers) or environmental (e.g., threatened flora and fauna) register listings. Any management options need to be consistent with the legal requirements for these listings.

- **Are there existing organisations or interest groups who can assist?** Organisations and groups such as Rangers, young community members, school groups, recreational organisations and 'grey nomads' can assist with both broader community education and in some cases, implementation of management programs

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Rangers with GPR specialist Prof. Lawrence Conyers, taking a break from GPR data collection at Mapoon Mission Cemetery, Mapoon, Queensland (Aunty Diane who was instrumental to this tool kit is featured to the left sitting on the blue esky) (Source: M.Sutton).

Identifying Threats

There are numerous threats that could result in damage or permanent loss of unmarked graves and cemeteries. While not a complete list, a range of typical threats are listed below. It is also important to understand that protecting the country is also essential because country is connected to cultural sites and resting places of old people. Caring for country needs to be considered as part of the protection of unmarked graves and cemeteries.

Threats	Description	
EROSION		
Coastal and riverine erosion	Erosion caused by natural processes (wind and water), loss of beachfront native vegetation, damage by feral animals, inappropriate land management, use of 4WD vehicles / quad bikes and inappropriate boat launching.	
Landscape erosion	Inadequate native vegetation cover and physical disturbance by natural and artificial processes exposes the land to erosional (wind and water) processes	
Sea level rise / storm tides	Sea level rise and high storm tides can inundate or erode burial sites. It can also kill native vegetation through increased inundation. This threat is increasing as a result of global warming (climate change) and may be very difficult to address. Refer to image below showing the projected sea level rise to 2100.	

Threats	Description
PLANTS AND ANIMALS	
Weeds	Weeds can out-compete native species and result in changes to the native vegetation communities, expose areas to erosion and reduce the aesthetics or amenity of a place.
Native plants	Uncontrolled growth of native vegetation and encroachment by non-Indigenous native vegetation in burial sites and cemeteries, can result in direct physical damage and reduce the aesthetics or amenity of a place. It is important to note that some traditional burial sites may be identified by a marker tree and that these should be protected.
Native animals	Overabundant native animals can result in direct and indirect land impacts. Overfishing and hunting can affect animal populations, impact country and increase weeds and pests.

HUMAN ACTIVITY	
Fires	Fires, in particular uncontrolled or hot fires, can result in direct damage to sites, damage to native vegetation and expose sites to erosion

Threats	Description
HUMAN ACTIVITY	
Vehicles	4WD, quad bikes and other vehicles can result in direct (physical damage) and indirect (increased erosion potential and spread of invasive weeds) land impacts and reduce the aesthetics or amenity of a place.
Recreation, tourism and camping	Tourists, visitors and locals can result in direct and indirect impacts through physical access, use of vehicles, camping and hunting. Uncontrolled, illegal or disrespectful use of areas can reduce the aesthetics or amenity of a place.
Management practices	Neglect of graves due to loss of knowledge over time, conflict over land ownership and responsibility, inappropriate practices (e.g. burning) or lack of funding can result in direct and indirect impacts and loss of aesthetics and amenity of a place.

Threats	Description
LAND USE	
Urban and industrial development	Inappropriate infrastructure or other development (such as services, interpretation for tourists and memorials) can directly impact sites and affect the cultural, social and scientific values of these places. It can also reduce the aesthetics or amenity of a place.
Construction of reservoirs and river engineering	Large scale landscape modification may inundate or otherwise render sites inaccessible.
Mining / exploration	Mining and exploration can result in permanent loss or reduced access to sites, vibration impacts to caves and rock shelters and other indirect impacts such as spread of weeds.
Farming	Farming can result in direct (physical damage) and indirect (increased erosion potential and spread of invasive weeds) land impacts.

Overview of Injinoo Cemetery, Queensland, showing the threat of coastal erosion to the cemetery boundary. A threat that is expected to increase over this century with ongoing climate change and sea level rise.

CASE STUDY

Mapoon

Mapoon in western Cape York is approximately 100 kilometres north of Weipa, Queensland. Elders remembered burials within earth mounds and family graves within the backyards of past and present housing, in addition to the three existing formal cemeteries with burials dating back to the 1880s.

The mortuary landscape that Elders and families continue to live within, which was within mining exploration leases and was also heavily susceptible to coastal erosion as well as cyclonic events, presented significant management challenges.

Elders working with Rangers and specialists devised a range of measures they considered culturally appropriate to protect and manage burial mounds, unmarked graves and established cemeteries that contained over 1000 graves. Cultural protocols were also developed to manage heavily eroding burial mounds and rebury remains elsewhere on country as well as a smoking ceremony for areas that may be haunted by spirits where houses are built on or nearby burial mounds and unmarked grave sites.

Development of a management plan and strategy for Mapoon Lands allowed Elders and their families to articulate their aspirations for managing the resting places of their ancestors and to continue to live in a culturally significant mortuary landscape with national heritage values.

Burial Mound at Shadforths, Mapoon, QLD (Source: E. St Pierre)

Determining the level of risk

Undertake a simple risk assessment (unless other requirements mandate a more formal risk tool to be used) to determine the level of threat and indicate priority for management action. The process can be simple and should involve the landowner and, in some cases, key interested parties. A suggested simple risk scale is provided below.

High	Medium	Low
Imminent irreversible or significant damage or loss Requires immediate management	Moderate damage Management action required but is not urgent	Damage is unlikely or minor Management action can be delayed

Only relevant threats need to be assessed against each place. An example matrix is provided below.

Place Name	Coastal Erosion	Weeds	Vehicles
Place 1	High	Medium	Not applicable
Place 2	Low	Low	High

Management options

A selection of typical management options are provided below along with an indication of the key threats managed. The preferred options should be chosen with consideration of the matters identified in the above sections. Another key consideration is the desire of the community to keep some places secret or restricted due to gender or cultural reasons.

Option	Description	Threats managed			
Land use		Erosion	Plants/erosion	Human activity	Land use
PHYSICAL PROTECTION					
Physical reinforcement	Physical reinforcement can take the form of hard structures (e.g. rock walls or bagged materials) or softer approaches such as use of protective matting (e.g. coconut matting / coils). Hard structures can be very effective at managing erosional processes but are very expensive to design and construct. Softer approaches can be relatively easily implemented but may not be as effective and perhaps less durable.	✔			
Natural reinforcement	Use of native vegetation to stabilise or demarcate areas and improve the amenity is a relatively easy solution provided adequate resources are available to ensure it becomes established and is protected from damage. The advantage of this approach is that it can be largely self-maintaining.	✔	✔	✔	✔

Option	Description	Threats managed			
		Erosion	Plants/erosion	Human activity	Land use
PHYSICAL PROTECTION					
Public exclusion	Exclusion measures can involve a range of measures. Fencing should only be used in key formal areas (e.g. Cemeteries) and where it doesn't detract from the place's amenity. Other measures to exclude access can include placement of logs, boulders or bollards which are more sympathetic.	✔	✔	✔	✔
LAND MANAGEMENT					
Animal and weed control	Implementation of control programs for overabundant native species (unless protected by legislation), feral animals and weeds are an effective way of minimise land damage and ensuring native vegetation is established.	✔	✔		
Fire management	Implementation of a fire management plan will assist to minimise the risk of wild fires.	✔	✔		

Option	Description	Threats managed			
		Erosion	Plants/erosion	Human activity	Land use
LEGISLATION AND MANAGEMENT SYSTEMS					
Legislative protection	Where not already protected, legislative listings (National, State or local) can provide greater certainty that inappropriate activity, development or land use will not occur, or would only be undertaken with due consideration to the values of a place. It can also assist to attract funding for place management.	✔	✔	✔	✔
Recognition in planning systems	Recognition in local or regional planning systems or management plans can provide greater certainty that inappropriate activity, development or land use will not occur, or would only be undertaken with due consideration to the values of a place. It can also assist to attract funding for place management.	✔	✔	✔	✔
Inspection programs	Implementation of a regular inspection program is a key way of monitoring the condition of sites and assessing if threat levels are changing or management actions are being effective.	✔	✔	✔	✔

Option	Description	Threats managed			
		Erosion	Plants/erosion	Human activity	Land use
EDUCATION AND INTERPRETATION					
Signage / interpretation	Providing interpretive or warning signage can be an effective means of engaging with the public. In some cases, this may not be appropriate where public knowledge of a place is not desirable.			✔	✔
Training programs for key people	Training programs for key people that own or have an interest in the land on which a place is located will assist to ensure they are aware of the values and minimise risk of accidental damage. Key people could include those responsible for cultural management (e.g., local rangers) or those who may maintain an area where a place is located (e.g. council workers)			✔	✔
Education campaigns (tourists, locals, school kids)	Informing local members of the community including school kids of the values of places is very effective means of engaging them in the management process. Providing information (where appropriate) to tourists and other visitors about the values of a place can assist to avoid unintended damage. In some cases, this may not be appropriate where public knowledge of a place is not desirable. Education of tourism operators is particularly important to ensure that they relate culturally appropriate and accurate stories to their clients.			✔	
Vehicle management	Establishing clear rules for vehicle access in areas and ensuring this is adequately communicated to all relevant parties will assist in minimising damage to sites.	✔		✔	

Management plans

Management plans can take many different forms and will depend on the complexity of the place(s) being managed and whether or not there are other requirements such as formal heritage listings for more formal plans. In the latter case, there are usually mandated structure and content for these plans which would vary depending on the jurisdiction and listing status (National or State). As such, these are not discussed further here and advice from the listing authority should be sought.

In all other cases, as a general rule, management plans should be concise and focused on being practical so that they are readily understood and easy to implement.

Example of a Management Plan – Poster Style

An effective way to readily communicating actions to all relevant parties is to capture the key management recommendations on a poster. These can be used in isolation or in conjunction with a report style management plan (as described above). An example is provided below.

Example of Management Plan Structure – Report Style

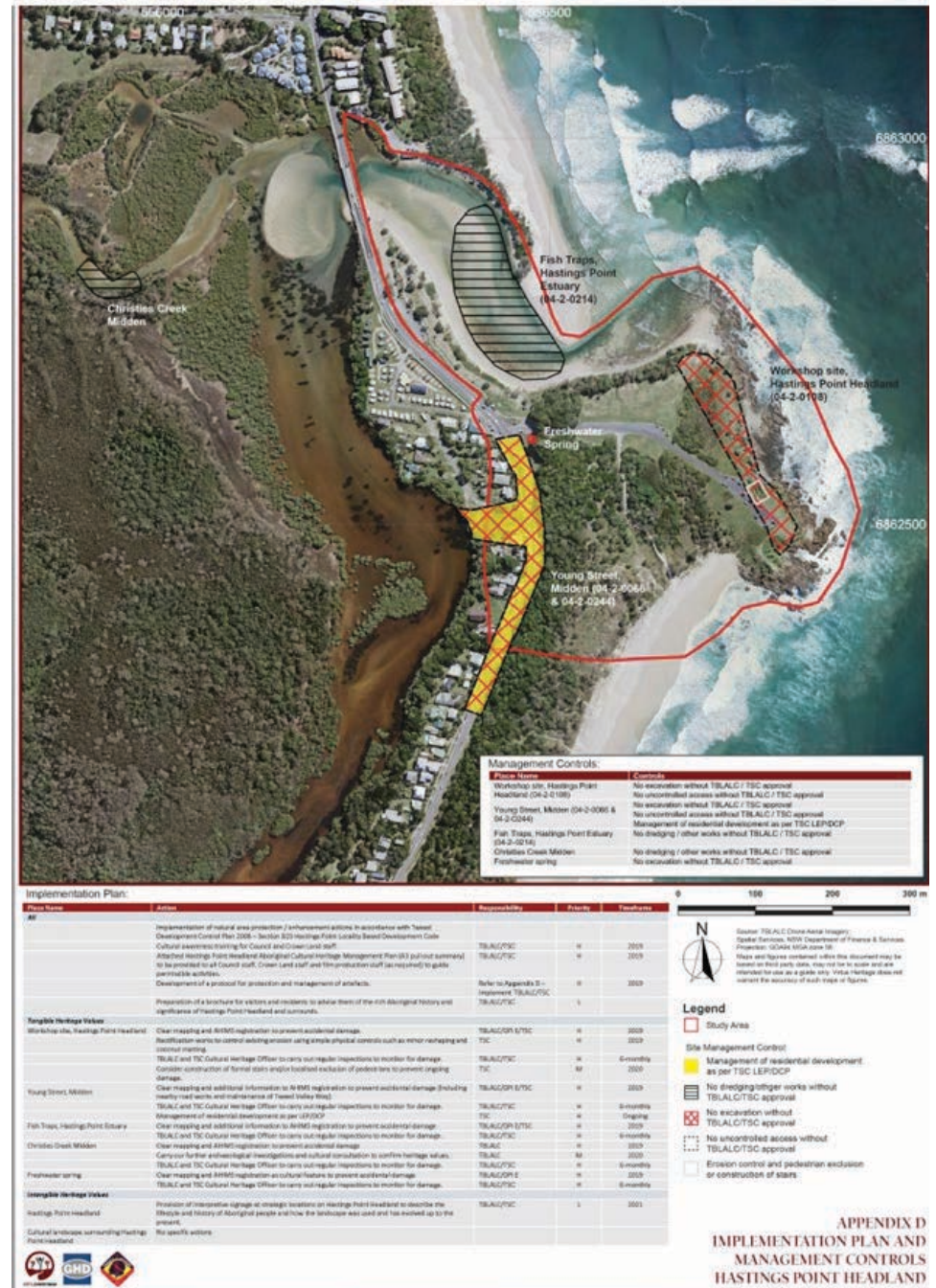A suggested structure for a report style management plan is provided below.

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Table: Suggested structure for a management plan

Section	Sub-sections / description
Acknowledgements	Acknowledgement of country and key community contributors
Introduction	Provide an overview of the plan and its purpose
Management context	Key stakeholders Land tenure Consultation (undertaken for the plan) Legislative context (for the plan) Existing management processes (brief description)
Cultural heritage values	Cultural heritage sites and places (brief description with maps and photos) Statement of values
Risk assessment	List of threats and assigned risk level
Implementation plan	Tabulated actions with responsibilities, priority and timeframes
Conclusion	Provide a concluding statement and any high level recommendations
References	List of documents used for the plan
Appendices	To suit the plan contents, could include: ▪ Heritage listings / information ▪ Procedures (see section below) ▪ Revegetation species ▪ Inspection / monitoring checklists

Cemetery plans

For defined cemeteries the preparation of a formal graphical plan that details the desired layout and arrangements may be desirable. These need to be developed in close consultation with the community and could detail a range of features such as:

- Headstones / grave markers – reinstatement of existing or new
- Pathways
- Decorative native vegetation plantings
- Resting / seating areas
- Fencing
- Cemetery entrance treatments.

Mapoon Mission Cemetery monument designed by Elders (Source: M. Sutton).

Example of Cemetery Plan Map from Mapoon Mission Cemetery, Queensland (Source: L. Conyers).

Procedures and checklists

Procedures and checklists can be used to support the management plan. Topics covered will depend on the places being managed but could include the following:

- Procedures for object discovery

- Procedures for human remains discovery / reburial

- Procedures for living / working where human remains exist

- Routine inspection checklists

Examples of these procedures and checklists are attached in Appendix F.

APPENDIX A

GLOSSARY

Glossary

amplitude: a measure of the "strength" of radar waves recorded by GPR systems. These values are recorded as dynamic range of digital values that define each sine wave recorded. Variations in wave amplitudes are a function of differences in velocity of traveling waves as they cross bounding surfaces that reflect energy, with the greater the velocity contrast, the higher the reflected amplitude.

amplitude maps: common maps produced by re-sampling the digital values of amplitudes recorded from interfaces in the ground. They are often referred to as "time-slice" maps or "depth-slice" maps, as they are produced from slices of ground defined by wave recording times or depth. Most often they are generated over a "thickness" of material in the ground, such as 5-10 nanoseconds or 20-40 centimetres'. They can also be constructed from only one distinct plane. These maps can also be produced to follow specific horizons that vary in their depth in the ground.

antennas: in GPR antennas these electronic devices transmit radio waves. They can be various shapes and sizes to generate different frequency waves, with larger antennas usually producing lower frequency (longer wavelength) waves. Electrical pulses are applied to an electrically conductive material, which depending on their shape, size and other electronic components, generate electromagnetic waves that propagate outward. They are often used in pairs, with one antenna transmitting with the other receiving and recording waves produced from reflections off interfaces in the ground, or other surfaces.

attenuation: the weakening and general reduction in the strength of radar waves as them move through a medium. In the ground this occurs when waves propagate through electrically conductive or magnetically permeable materials. Weakening also occurs as propagating waves, moving in a conical transmission pattern, spread over a greater amount of ground creating additional weakening.

coupling, of radar energy with the ground: a relative measurement how well transmitted radar waves move across the ground-air interface to propagate into the ground. Variations in coupling can be caused by the constituents of surface materials, the placement of the antenna on the ground, the amount of tilt of antennas, the distance of the antenna off the ground, and other factors. Good coupling means radar waves have moved into the ground and are being transmitted to depth. Coupling variations along an antenna transect create anomalous reflections in GPR reflection profiles and can distort GPR images.

data processing, post-acquisition: digital software methods that modify GPR reflection data after they have been acquired to adjust the reflections in some ways prior to display and interpretation. These methods can be vertical and horizontal axes adjustments, filtering of frequencies, gaining of reflection amplitudes and many other methods used to overcome noise, distortion and other common GPR variations.

electromagnetic energy: energy propagated through space or a material that are the co-joined waves of electrical and magnetic waves. GPR waves are electromagnetic, classified as radio waves (defined only by their frequency). Other electromagnetic energy types, not applicable to this book, are infrared radiation, visible light, ultraviolet radiation, X-rays, and gamma rays.

Glossary (cont.)

frequencies, of antennas: the rate at which a wave vibrates, measured per second in values of hertz. The higher the frequency, the shorter the wavelength generated. Most GPR antennas produce an electromagnetic field that creates propagating waves that vibrated in in the 10-1200 megahertz (MHz) range. One unit of megahertz is 1,000,000 oscillations per second.

hyperbola, as in describing a reflection: shape of reflections generated from "point sources" in the ground, caused by the spreading of transmitting radar energy as it moves deeper in the ground from a surface antenna.

isosurfaces: a computer rendered three-dimensional surface that in GPR studies can be used to visualize on the computer a reflection surface from a buried feature in the ground.

Megahertz (Mhz): unit of measurement of frequency common in with GPR antennas, which are units of the oscillation of waves. Equal to one million hertz. One hertz is one oscillation per second.

mobile phone, frequency: important as these are generators of background noise for GPR. They generally range from 800-1800 MHz, with some lower frequencies in Europe. The newer 3G and 4G frequencies are in the higher frequency range. When using GPR antennas in the 500-1200 MHz range, interference from these devices can be a problem. That cell phone noise must be removed from data using post-acquisition filtering programs common in most software programs. All cell phone and personal communication devices will produce extraneous electromagnetic interference when transmitting, but usually not when only in receiving mode.

nanoseconds (ns): the time used to record the two-way travel times of radar waves. A nanosecond is one billionth of a second.

noise: any un-wanted waves recorded during GPR collection. Most commonly they are background radio transmissions but could be internal system-generated waves or air waves, to name a few.

point-source: a discrete object in the ground that produces a hyperbolic-shaped reflection. These are often rocks, pipes, objects, or any aerially-limited reflection surface.

radar: an acronym, which has now become a word in its own right, which began to be used in 1942 for reflected radio waves used for detecting objects in the air. It stands for "radio detection and ranging". This acronym replaced the British acronym RDF that originally stood for "radio direction finding".

reflections: other than the obvious definition a wave being reflected from a surface, it is also commonly used as slang in GPR and seismic wave interpretation for a visually continuous planar surface visible in a reflection profile.

spreading of radar waves: movement of waves from a surface antenna in a generally conical shape, with the apex of the cone at the surface antenna. The conical radiation pattern produced by most GPR antennas is elongated in the direction of antennas movement, if the paired transmission and recording antennas are placed perpendicular to the transect (the usual way antennas are moved for most applications).

survey transects: any line along the ground surface that an antenna moves. Often, they are usually linear if collected within a grid, using a Cartesian

Glossary (cont.)

coordinate system to define their location. But they can be placed in any orientation or geometry if antennas are moved around obstacles or placed in a way to optimize how reflections are recorded from buried interfaces.

trace: a digital recording of waves recorded at one spot on the ground. Usually composed of multiple reflections recorded within a "time window", where all waves are "stacked" into one composite waveform. Traces can be analysed individually to help define reflection at one location but are most commonly "stacked" together sequentially along a survey transect, to generate a reflection profile.

time window: a period of time, measured in nanoseconds, which a GPR system is programmed to record waves that intersect the receiving antenna.

travel time: usually the "two-way" time that is measured from when a radar wave leaves the transmitting antenna, moves through a medium, and is then received and recorded at a paired receiving antenna. Can sometimes be "one-way" if antennas are separated and certain types of velocity tests are being performed, or packages of ground are being studied by separating antennas in some other study method.

APPENDIX B

COMMONWEALTH AND STATE HERITAGE LEGISLATION, GUIDELINES AND USEFUL LINKS

Commonwealth and State Heritage Legislation, Guidelines and Useful Links

Commonwealth

Aboriginal and Torres Strait Islander Protection Act, 1984
https://www.legislation.gov.au/Details/C2010C00807

Environment and Protection Biodiversity Conservation Act, 1999
https://www.legislation.gov.au/Details/C2012C00685

Burra Charter, 2013 (and practice notes)
https://australia.icomos.org/wp-content/uploads/The-Burra-Charter-2013-Adopted-31.10.2013.pdf

https://australia.icomos.org/publications/burra-charter-practice-notes/

Ask First – A guide to respecting Indigenous Heritage Places
https://www.wipo.int/export/sites/www/tk/en/databases/creative_heritage/docs/ask_first.pdf

Indigenous Heritage Laws
http://www.environment.gov.au/heritage/laws/indigenous

Australian Capital Territory

Heritage Act 2004
https://www.legislation.act.gov.au/a/2004-57

New South Wales

Heritage Act 1077
https://legislation.nsw.gov.au/view/html/inforce/current/act-1977-136

NSW National Parks and Wildlife Act, 1974 and amendments 2010
https://legislation.nsw.gov.au/view/html/inforce/current/act-1974-080

Due Diligence Code of Practice for the Protection of Aboriginal Objects in New South Wales
https://www.environment.nsw.gov.au/research-and-publications/publications-search/due-diligence-code-of-practice-for-the-protection-of-aboriginal-objects-in-new-south-wales

Aboriginal Cultural Heritage Consultation Requirements for Proponents, 2010
https://www.environment.nsw.gov.au/research-and-publications/publications-search/aboriginal-cultural-heritage-consultation-requirements-for-proponents-2010

Guide to Investigating, Assessing and Reporting on Aboriginal Cultural Heritage in NSW
https://www.heritage.nsw.gov.au/assets/Uploads/publications/524/guide-to-investigating-assessing-reporting-aboriginal-cultural-heritage-nsw-110263.pdf

Northern Territory

Northern Territory Heritage Act 2011
https://legislation.nt.gov.au/Legislation/HERITAGE-ACT-2011

Northern Territory Aboriginal Sacred Sites Act 1989
https://legislation.nt.gov.au/en/Legislation/NORTHERN-TERRITO-RY-ABORIGINAL-SACRED-SITES-ACT-1989

Queensland

Aboriginal Cultural Heritage Act 2003
https://www.legislation.qld.gov.au/view/html/inforce/current/act-2003-079

Torres Strait Islander Cultural Heritage Act 2003
https://www.legislation.qld.gov.au/view/html/inforce/current/act-2003-080

South Australia

Aboriginal Heritage Act 1988
https://www.legislation.sa.gov.au/lz/c/a/aboriginal%20heritage%20act%201988.aspx

Tasmania

Aboriginal Heritage Act 1975
https://www.legislation.tas.gov.au/view/html/inforce/current/act-1975-081

Victoria

Aboriginal Heritage Act 2006
https://www.legislation.vic.gov.au/in-force/acts/aboriginal-heritage-act-2006/024

Western Australia

Aboriginal Heritage Act 1972
https://www.legislation.wa.gov.au/legislation/statutes.nsf/main_mrtitle_3_homepage.html

APPENDIX C

COMMONWEALTH AND STATE LEGISLATION, GUIDELINES, FACTSHEETS AND LINKS PERTAINING TO HUMAN REMAINS

Commonwealth and State Heritage Legislation, Guidelines, Factsheets and Useful Links pertaining to Human Remains

Commonwealth

Biosecurity (Managing Human Remains) Instrument 2016
https://www.legislation.gov.au/Details/F2019C00687

Australian Capital Territory

Cemeteries and Crematoria Act 2020
https://www.legislation.act.gov.au/a/2020-7/

Births, Deaths and Marriages Registration Act 1997
https://www.legislation.act.gov.au/a/1997-112

New South Wales

Heritage NSW Repatriation of Aboriginal Cultural Material and Ancestors Information
https://www.heritage.nsw.gov.au/protecting-our-heritage/repatriation-of-aboriginal-cultural-material/

NSW Coroner's Act 2009
https://legislation.nsw.gov.au/view/whole/html/inforce/current/act-2009-041

Anatomy act 1977 No. 126.
https://legislation.nsw.gov.au/view/html/inforce/current/act-1977-126#sec.8A

Public Health Regulations 2012 Part 8
https://legislation.nsw.gov.au/view/whole/html/inforce/current/sl-2012-0311#pt.8

Northern Territory

Burial and Cremation Act 2019
https://cmc.nt.gov.au/__data/assets/pdf_file/0005/598397/burial-cremation-act-2019-bill.pdf

Cemeteries Act 2004
https://legislation.nt.gov.au/api/sitecore/Act/PDF_History?id=20843

Aboriginal Areas & Protection Authority, Sacred sites, Heritage and Burials
https://www.aapant.org.au/sacred-sites/sacred-sites-heritage-and-burials

Queensland

Queensland Government – Link pertaining to Human Remains
https://www.qld.gov.au/firstnations/environment-land-use-native-title/cultural-heritage/human-remains

Coroners Act 2003
https://www.legislation.qld.gov.au/view/pdf/inforce/current/act-2003-013

South Australia

Burial and Cremation Regulation 2014
https://www.legislation.sa.gov.au/LZ/C/R/BURIAL%20AND%20CREMATION%20REGULATIONS%202014/CURRENT/2014.5.AUTH.PDF

Burial and Cremation regulation 2013
https://www.legislation.sa.gov.au/lz/c/a/burial%20and%20cremation%20act%202013/current/2013.20.auth.pdf

South Australia Public Health, Factsheet - Burial of human remains on private property
https://www.sahealth.sa.gov.au/wps/wcm/connect/f69e64004dd6754d8065fe6d722e1562/burial+of+human+remains+on+private+property+fact+sheet+FINAL+%2808112017%29.pdf?MOD=AJPERES&CACHEID=ROOTWORKSPACE-f69e64004dd6754d8065fe6d722e1562-nwLJ2eD

South Australia Public health, Factsheet - Disposal of human remains: procedures for exhumation and export authorisation
https://www.sahealth.sa.gov.au/wps/wcm/connect/32a65d004dd67a578125ff6d722e1562/Factsheet+Disposal+of+human+remains+.pdf?MOD=AJPERES&CACHEID=ROOTWORKSPACE-32a65d004dd67a578125ff6d722e1562-nwL9q5q

SA Coroners Act 2003
https://www.legislation.sa.gov.au/lz/c/a/coroners%20act%202003/current/2003.33.auth.pdf

Adelaide Cemeteries Authority Act, 2001
https://www.legislation.sa.gov.au/lz/c/a/adelaide%20cemeteries%20authority%20act%202001/current/2001.25.auth.pdf

Tasmania

Burial and Cremation Act 2019
https://www.legislation.tas.gov.au/view/whole/html/asmade/act-2019-050

Burial and Cremation Regulations 2015
https://www.legislation.tas.gov.au/view/whole/html/inforce/current/sr-2015-033

Museums (Aboriginal Remains) Act 1984
https://www.legislation.tas.gov.au/view/html/inforce/current/act-1984-075#GS4@EN

Victoria

Repatriation ceremonial object and human remains under UN declaration on the Rights of Indigenous Peoples.
https://www.aboriginalheritagecouncil.vic.gov.au/report-repatriation-ceremonial-objects-and-human-remains-under-un-declaration-rights-indigenous

Private cemeteries and burials
https://www2.health.vic.gov.au/public-health/cemeteries-and-crematoria/interments-and-memorials/private-burials

Cemeteries and Crematoria Act 2003
https://www.legislation.vic.gov.au/in-force/acts/cemeteries-and-crematoria-act-2003/035

Cemeteries and Crematoria Act 2015
https://www.legislation.vic.gov.au/in-force/statutory-rules/cemeteries-and-crematoria-regulations-2015/003

Western Australia

Aboriginal Sites, Objects and Ancestral Remains
https://www.wa.gov.au/organisation/department-of-planning-lands-and-heritage/aboriginal-sites-objects-and-ancestral-remains

Ancestral remains
https://www.wa.gov.au/organisation/department-of-planning-lands-and-heritage/aboriginal-sites-objects-and-ancestral-remains#ancestral-remains

Births, Deaths & Marriage Registration act 1998
https://www.legislation.wa.gov.au/legislation/prod/filestore.nsf/FileURL/mrdoc_43542.pdf/$FILE/Births%20Deaths%20and%20Marriages%20Registration%20Act%201998%20-%20%5B02-g0-00%5D.pdf?OpenElement

Cemeteries Act 1986
https://www.legislation.wa.gov.au/legislation/prod/filestore.nsf/FileURL/mrdoc_43419.pdf/$FILE/Cemeteries%20Act%201986%20-%20%5B03-c0-00%5D.pdf?OpenElement

Western Australian Museum, Collections Policy
https://www.parliament.wa.gov.au/publications/tabledpapers.nsf/displaypaper/3813188adcca677f31e2bcc948257855000f4a05/$file/3188.pdf

APPENDIX D

FUNDING SOURCES

Commonwealth

Funding Type	Funding Body	Description/Amount Accessible as of 2021	Links and Contacts
Government	Indigenous Advancement Strategy	The Indigenous Advancement Strategy consolidates the many different Indigenous policies and programs that were delivered by the Commonwealth Government into five overarching programs: ▪ Jobs, Land and Economy ▪ Children and Schooling ▪ Safety and Wellbeing ▪ Culture and Capability ▪ Remote Australia Strategies The strategy can fund cultural heritage programs/ projects including management documents, identification and assessment of cultural places, their maintenance, interpretation and protection and could apply to cemeteries and unmarked graves.	https://www.niaa.gov.au/indigenous-affairs/grants-and-funding/indigenous-advancement-strategy
Government	Australian Heritage Grants	The Australian Heritage Grants program is the Australian Government's flagship heritage program. It provides ongoing support to protect and promote national heritage listed places. The program provides $5.3 million per annum, with a call for applications each year. All national heritage listed places that have been recognised for their natural, Indigenous, or historic heritage values are eligible for funding under this program. The program aims to improve conservation, preservation and access to national heritage listed places; and enrich appreciation of the values of listed national heritage places through improved community engagement.	https://www.environment.gov.au/heritage/grants-and-funding/australian-heritage-grants

Commonwealth (cont.)

Funding Type	Funding Body	Description/Amount Accessible as of 2021	Links and Contacts
Government	Indigenous Protected Areas Grants	Indigenous Protected Areas (IPAs) are areas of land and sea managed by Indigenous groups as protected areas for biodiversity conservation. Day-to-day activities of Indigenous rangers on IPAs may include interpretive activities for visitors, protection of rock art, and cultural history and language projects. Traditional bush tucker and medicine knowledge is taught on country to younger generations. The Indigenous Protected Areas program is administered by the National Indigenous Australians Agency. Further information, including a map of all IPA project locations, is available on the National Indigenous Australians Agency's caring for state heritage grants.	https://www.environment.gov.au/land/indigenous-protected-areas
Government	Our Country Our Future – Indigenous Land and Sea Corporation (ILSC) Funding	Our Country Our Future is the ILSC's national funding program. It operates across urban, regional and remote areas—it doesn't matter where in Australia you live. Through Our Country Our Future, the ILSC can provide a wide range of assistance to those proposing projects: from brokering and developing partnerships, facilitating and coordinating support, and providing funding assistance.	Free call 1800 818 490 https://www.ilsc.gov.au/home/part-ner- with-us/our-country-our-future/
Not for Profit	Foundation for Rural and Regional Renewal	Not for profit community based organisations can apply for funds to support projects and activities that offer clear public benefit for communities in small rural, regional and remote locations in Australia, contributing to their social and community welfare, economic, environmental, health, education or cultural development. Grants of up to $5,000 are available for projects and activities that offer clear public benefit for communities in rural, regional or remote Australia. Priority is given to communities of 10,000 or fewer.	https://frrr.org.au/funding/find-funding-now/

Commonwealth (cont.)

Funding Type	Funding Body	Description/Amount Accessible as of 2021	Links and Contacts
Private	Creative Partnerships Australia	Creative Partnerships Australia deliver year-round programs that assist Australian artists and arts organisations to attract and maintain private sector support. MATCH provides dollar-for-dollar matched funding of up to $10,000 for private sector crowdfunding campaigns in support of an arts project. Plus1 is a matched funding program that supports small to medium arts organisations to attract new donors, build relationships and networks and boost their fundraising skills. Plus1 gives small to medium arts and cultural organisations dollar-for-dollar matched funding for fundraising campaigns. Successful recipients will share in $1.2 million in funding, capped at $50,000 per project.	www.creativepartnershipsaustralia.org.au
Private	Harold Mitchell Foundation Community Grants	The Harold Mitchell Foundation's grant scheme is about helping people help each other. So many organisations out there are full of great ideas, people and drive. To make a really big difference in our community, they just need a little bit of money, and that's what we're here to provide. Since we started out in 2000, the Foundation has provided up to $7 million in grant funding to over 100 different organisations, in everything from health to the arts. *Community Grants* Invite applications from the community for grants of less than $10,000 to fund projects that reflect a theme.	haroldmitchellfoundation.com.au

Commonwealth (cont.)

Funding Type	Funding Body	Description/Amount Accessible as of 2021	Links and Contacts
Private	Australian Geographic Community Grants	Project Sponsorships (up to $10,000 in four categories - science, environment, adventure, community) and include community heritage funding. - Science: Specific research projects, often across a number of years, across all disciplines. - Community: Conservation and cultural initiatives, often at a grassroots level. - Adventure: Undertaking adventures in Australia and abroad. - Environment: Community-based initiatives such as wildlife rescue and rehabilitation, plant and animal education programs or bush conservation.	AG Society Administrator Email: society@ausgeo.com.au Phone: (02) 9263 9825 https://www.australiangeographic.com.au/society/sponsorship/2019/12/apply-for-sponsorship/
Not for Profit	Philanthropy Australia	Philanthropy Australia provides useful links and advice to find funding.	https://www.philanthropy.org.au/seek-funding/how-to-seek-funding/

International

Funding Type	Funding Body	Description/Amount Accessible as of 2021	Links and Contacts
Private	National Geographic	The National Geographic Society awards grants for research, conservation, education, and storytelling through its Committee for Research and Exploration. National Geographic welcomes applications from around the world, and specifically encourages applicants from outside the United States to apply. Applicants planning to work outside of their home country should include at least one local collaborator on their team. The Committee will not usually consider applications that support strictly laboratory or collections work. Grants are awarded on the basis of merit and exist independent of the Society's other divisions.	http://www.nationalgeographic.org/grants/how-to-apply/
Private	Wenner Gren Foundation	*Grants for Non-U.S. Scholars* All of the Foundation research grants are available to students and scholars regardless of nationality and place of residence. Alongside this, the Foundation has some specific programs to support students and scholars in countries where there are limited institutional and financial resources for anthropology. *Conferences and Workshops* Grants are available to bring international scholars together to develop anthropological knowledge and debate. Grants are made for amounts up to $20,000	http://www.wennergren.org/programs

Australian Capital Territory

Funding Type	Funding Body	Description/Amount Accessible as of 2021	Links and Contacts
Government	ACT Heritage Grants Program	The ACT Heritage Grants Program is an annual funding program administered by the ACT Government to assist the community in working to conserve and promote the heritage of the ACT. The grants will provide $387,000 (in 2021-2022 funding round) to identify and carry out projects that promote and conserve local heritage. Funding priorities include: - ACT Heritage Register - Conservation works that enable the continued preservation, protection, use of and access to places and objects registered on the ACT Heritage Register; and Conservation Management Plans for registered places and objects, and Aboriginal places and objects. - Community Participation - Projects that actively engage people in understanding, celebrating and promoting heritage places and objects through education (of all ages), oral histories, tourism, interpretation and events. - Aboriginal Heritage - Projects initiated by or involving the local Aboriginal community in cultural heritage activities. - Partnerships - Projects that provide partnership opportunities between community organisations and ACT government agencies.	https://www.environment.act.gov.au/heritage/heritage-and-the-community/heritage-grants-program

New South Wales

Funding Type	Funding Body	Description/Amount Accessible as of 2021	Links and Contacts
Government	Community Small Grants and Education Scholarships Program	Hunter Local Land Services (HLLS), through funding from the Catchment Action NSW program, will be delivering a three-year program for community groups, networks or associations and individuals in building knowledge, skills and participation in land management practices. We encourage landcare groups, industry associations or farmer networks, pest animal networks, aboriginal organisations or other NRM or agricultural community organisations to apply. The Community Small Grants program aims: 1. To build individual/groups skills and knowledge in land management practices; 2. To build community participation, knowledge and skills with community organisations, groups or local communities. The Education Scholarships program aims to provide opportunities for individuals aged 18-45 to build skills and knowledge in land management practices through informal or formal training opportunities, in particular individuals who are Aboriginal or Torres Strait Islanders, individuals who are developing Agricultural careers or involved in Industry groups or agricultural networks, or are active Landcare Network/Group members.	https://www.lls.nsw.gov.au/regions/hunter/grants-funding-scholarships
Government	NSW Government Heritage Grants	The Department of Premier and Cabinet and the Heritage Council of NSW work together to connect communities to heritage at a local and state level. One way they do this is through the Heritage Grants Program, providing grants to heritage owners and custodians, local government and the community to deliver a broad range of heritage outcomes. Categories include: Emergency Works Grants; Aboriginal Cultural Heritage Grants; Community Heritage Grants.	https://www.environment.nsw.gov.au/topics/heritage/

New South Wales (cont.)

Funding Type	Funding Body	Description/Amount Accessible as of 2021	Links and Contacts
Government	Protecting Our Places Program	The NSW Environmental Trust offers the Protecting our Places Program. This program supports projects that restore or rehabilitate Aboriginal land and land that is culturally significant to Aboriginal people, as well as educate Aboriginal and other communities about the environment. Available funding up to $60,000.	https://www.environment.nsw.gov.au/funding-and-support/nsw-environmental-trust/grants-available/protecting-our-places

Northern Territory

Funding Type	Funding Body	Description/Amount Accessible as of 2021	Links and Contacts
Government	Northern Territory Heritage Grants Program	The Northern Territory (NT) Heritage Grants Program funds conservation work to privately owned heritage places and objects. You can apply for up to $20,000. If you have a larger project in mind, you are encouraged to consider staging the project. Priority is given to places and objects on the NT Heritage Register, but grants may also be considered for work to other places and objects of historical importance.	https://nt.gov.au/leisure/arts-culture-heritage/grants/apply-for-a-heritage-grant

Queensland

Funding Type	Funding Body	Description/Amount Accessible as of 2021	Links and Contacts
Government	Looking After Country Grant	The Looking after Country Grant program provides funding of up to $75,000 to First Nations communities to conserve and manage environmental and cultural heritage on country. The program aims to build community capacity to deliver these projects, and to develop strong partnerships in caring for country. Project activities funded through the program include (but are not limited to): - cultural site management - protected species monitoring and conservation - revegetation and habitat restoration - fire management - erosion control - inter-generational knowledge exchange on country - the development and implementation of country management plans.	https://www.qld.gov.au/environment/plants-animals/conservation/community/land-sea-rangers/grants-program Grants Officer Phone: (07) 3330 5553 or email landandsea@des.qld.gov.au

APPENDIX E

USEFUL CONTACTS AND LINKS

Commonwealth

Heritage organisations (all states & territories)

https://www.environment.gov.au/heritage/organisations

ACT

Environment, Planning & Sustainable Development Directorate-Environment

https://www.environment.act.gov.au/about-us/contact

New South Wales

NSW Enviro Line – Department of Planning, Industry and Environment

https://www.planning.nsw.gov.au/Contact-Us?

NSW State Aboriginal Land Council

https://alc.org.au/contact-us/

Heritage NSW

https://www.heritage.nsw.gov.au/what-we-do/contact-us/

Northern Territory

Northern Territory Environment Protection Agency

https://ntepa.nt.gov.au/contact-us

Aboriginal Areas Protection Authority

https://www.aapant.org.au/contact

Department of Infrastructure, Planning and Logistics

https://dipl.nt.gov.au/

Northern Territory Planning Commission

https://planningcommission.nt.gov.au/contact-us

Queensland

Aboriginal and Torres Strait Islander Cultural Heritage Unit

Phone: 1300 378 401

Email: cultural.heritage@datsip.qld.gov.au

Heritage Conservation National Trust QLD

Phone: (07) 5534 0873

Email: info@nationaltrustqld.org

Postal address: 28 Tomewin St, Currumbin QLD,4223, Australia

South Australia

South Australian Heritage Council

Phone: (08) 8226 2127

Conservation and Development

Phone: (08) 8124 4922

SA Heritage Register

Phone: (08) 8124 4960

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Postal address: GPO Box 1047, Adelaide SA 5001

Department of Environment and Water

https://www.sa.gov.au/topics/about-sa/government/departments/environment-and-water

Environment Protection Authority

https://www.sa.gov.au/topics/about-sa/government/departments/environment-protection-authority

Tasmania

Aboriginal Heritage Tasmania

https://www.aboriginalheritage.tas.gov.au/contact-us

Tas Department of Primary Industries, Parks, Water and Environment

https://dpipwe.tas.gov.au/contact-us

Victoria

Victorian Aboriginal Heritage Council

https://www.aboriginalheritagecouncil.vic.gov.au/

Western Australia

Department of Planning Lands and Heritage

https://www.dplh.wa.gov.au/contact-us

Western Australian Aboriginal Affairs

https://www.wa.gov.au/service/aboriginal-affairs

APPENDIX F

EXAMPLE OF INSPECTION CHECKLIST FOR GRAVES/SITES AND PROTOCOLS FOR FINDING GRAVES

INSPECTION CHECKLIST			
Name:		**Date:**	
Site:			
Site Condition:		**Notes** Take photos from key reference point to enable comparison between inspections where necessary.	
Vehicle damage?	Yes	No	
Feral animal damage?	Yes	No	
Weeds present?	Yes	No	
Rubbish present?	Yes	No	
Asbestos present?	Yes	No	
Existing controls in good condition (fences etc)?	Yes	No	
Other observations:			

Procedure for Identification/Finding Suspected Human Remains

If suspected human remains are identified or found exposed, the following steps need to be followed

Step 1

All works in the area must cease immediately and the area cordoned off or demarcated and protected from any potential disturbance.

Step 2

   a)   Immediately contact the relevant Police to come and inspect the remains.

   b)   Notify the relevant Traditional Owners and registered native title claimants and/or LALC regarding the find and for them to provide a representative present during the police/coroner inspection of remains.

Step 3

   a)   If the Coroner and Police's forensic expert provide written notification (not verbal) that the remains are not human but animal – notify the results to LALC and Traditional Owners before making a final determination of what to do with the remains.

   b)   If the Coroner and Police's forensic expert provide written notification (not verbal) that the remains are human and are not likely to be of Aboriginal origin and recent – notify the results to LALC and Traditional Owners and the contact for the Police for any further queries.

   c)   If the Coroner and Police's forensic expert provide written notification (not verbal) that the remains are human and are likely to be of Aboriginal origin and not recent – notify the results to LALC and Traditional Owners and the Site Registrar and Manager of the relevant government agency for Aboriginal cultural heritage.

   The notification must include:

   - A map of the location of the remains (grid co-ordinates from a GPS would be best or Google Earth map file)
   - Photographs with a scale of the remains and a general overview of their location
   - Description of the remains
   - Written documentation from Police

Also notify the relevant land trustee and manager.

Determine in consultation with government agency regulating Aboriginal cultural heritage, Traditional Owners and the LALC the potential future management of these remains and then notify the relevant land trustee of proposed actions (i.e. reburial of remains, proposed study by a bio-anthropologist etc).

Procedure for artefact discovery

If any new artefacts (Aboriginal or historical) are identified on country or near the grave sites, this procedure should be followed:

a) A photograph of the overview of the location of the artefacts is provided with a flag or object used as a marker

b) A photograph of a close up of the artefact (if a stone artefact front and back surface (ventral and dorsal) in its location with a scale (IFRAO scale or measured scale - if not on hand, coin, key or pen))

c) GPS recording of the artefact and site (Latitude and Longitude or grid system (MGA or AMG) and grid coordinates - easting and northing taken)

d) A description made including the following information:

- Locational information (closest landmarks, distance from nearby road and how to get to location, where the artefacts are found)

- Number of artefacts

- Type of material artefacts are made of

- Possible age of artefacts

- Any information known by community and Elders about the artefacts

- If found in eroded area the approximate extent (length/width) of erosion scour or of the possible site.

e) Notify relevant Cultural Heritage Officer or Rangers if artefacts are found to undertake the recording for the find (as above). The Cultural Heritage Officer should also note if there is any restricted cultural information on the artefacts/site and ensure this information is protected/restricted for access in consultation with Traditional Owners.

f) Cultural Heritage Officer will liaise with relevant Traditional Owners and LALC, if artefacts need to be surface collected and removed from country.

g) The recording as outlined above including the location of where any material is moved to (following steps a) to e) above for the relocation) must be sent to the relevant regulator for cultural heritage in State/Territory to register on a sites database