Landscape Archaeology and Indigenous Nation Building in Ngadjuri Country

Photo taken on Ngadjuri Country by Flinders University Students.

A 20,000 word thesis submitted in November 2009 for the degree of Master of Archaeology, Department of Archaeology, Flinders University by Kylie Lower
I certify that this thesis does not incorporate without acknowledgement any material previously submitted for a degree or diploma in any university; and that to the best of my knowledge and belief it does not contain any material previously published or written by another person except where due reference is made in the text.
Abstract

The European Diaspora has had devastating effects for Indigenous populations around the globe. Many groups faced forced assimilation, dispossession of traditional lands, policies aimed at halting cultural transmission between generations, death by disease and outright massacre. In many parts of the world, the effects of colonisation were massive in scale and still impact the lives of groups and individuals today. The Ngadjuri of South Australia suffered many of the previously mentioned maladies through the British colonisation and were largely removed from their Country by the late 1800s. The community is now in the process of returning to Country and the building of a modern Ngadjuri Nation. This project is a facet of this Ngadjuri nation building process.

This research included a basic landscape study, conducted with site information for Ngadjuri Country held at the Aboriginal Affairs and Reconciliation Division (AARD), of South Australia. Fieldwork was conducted to verify the location of some sites and with the resulting information, a GIS database was created which the community will retain. The landscape analysis has highlighted the location of documented sites in relation to several variables including general environment, access to water, vegetation and ground slope, as well as identifying site distribution based on site type. This work adds to the bodies of literature regarding both landscape archaeology and Indigenous nation building, as well as contributing to studies of Indigenous land-use on the broader Australian continent. The research has found that assisting a community to acquire control of information regarding archaeological sites and past landscape use on their Country can aid in several facets of Indigenous nation building which include, but are not limited to, the transmission of cultural knowledge, the management of heritage, self determination and the assertion and authentication of cultural identity to the broader society.
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Chapter 1
Introduction

Thesis Topic

This thesis is the result of a community-based project conducted in collaboration with the Ngadjuri community, an Indigenous group whose traditional lands are situated in the mid-north of South Australia, as part of their ‘return to “Country”.¹ The research involved the creation of a GIS database for the community, which included spatial data for all previously recorded archaeological sites and surveyed areas on their traditional lands. The resulting data was used to conduct a landscape archaeological analysis of the region.

¹ The Ngadjuri were severely displaced through European colonisation. The community is now in the process of ‘returning to Country’. This is a process of re-gaining cultural knowledge that was lost through displacement and removal from their traditional lands, the transmission of this knowledge to younger generations and acquisition of community control of aspects of culture. See Chapter 5 for more detail.
Figure 1.1. Map of Australia Showing General Location of Ngadjuri Country (not to scale).

Aims and Significance

This research has two main aims, firstly to conduct an archaeological landscape analysis of the region, and secondly to provide the Ngadjuri community with a GIS database of all of the sites and surveyed areas in their Country.

The primary research questions are:

- What can the range and distribution of archaeological sites on Ngadjuri Country tell us about past use of this landscape?
- How can this information and the control over it in spatial form assist in the Ngadjuri process of returning to Country?
- How does this relate to the broader issue of Indigenous Nation building?

This thesis makes a significant contribution to archaeological research on landscapes. It is one of a small number of Australian-based studies to undertake a landscape analysis on a large scale. As such, it builds on the work of a small number of scholars (see for example Clarkson 2006; Head and Fullager 1997; Pickering 1994; Ridges 2003), and makes a significant contribution to the national understanding of these issues. Not only is it the first landscape analysis for the particular study area, it is also a study in which the region’s boundaries have been determined by an Aboriginal construct (i.e. the Ngadjuri language group area) as defined by Tindale 1940, 1974) and Horton (1996), and endorsed by the Ngadjuri today.
The synthesis of data highlights gaps in our archaeological knowledge of the region and provide avenues for future research in the area. Additionally, this research adds to the depth of literature in landscape archaeology, particularly providing comparative data regarding the land use patterns of non-sedentary populations in semi-arid areas (Hard and Merrill 1992; Head and Fullager 1997; Ridges 2003; Veth 2005).

This research is significant at the local, national and international levels. At the local level, it serves as an integral part of the future management plans of the Ngadjuri. This project was initiated by the community, and is being carried out in response to their desire to have a GIS database of archaeological sites and surveys in their control. The database could be employed to reach a variety of outcomes. These applications are explored further in chapter 5.

At the national level, Indigenous issues are a matter of priority and the cultural and economic empowerment of Indigenous groups is a matter of concern for the current government (Commonwealth of Australia, 2008). The control of cultural information can be seen as a form of empowerment and, as such, a step toward ‘closing the gap’, a national priority (see Commonwealth of Australia, 2008; Macklin and Rudd 2008). Additionally, the practical applications for education (see Chapter 5) are an ideal fit with Australia’s National History Curriculum, which archaeology is in a unique position to enrich (see for example Nichols and Ulm 2008; Smith et al. 2008).
Internationally, the empowerment of Indigenous peoples and providing a mechanism for sustaining and promoting cultural diversity are issues of primary importance (see United Nations 2007). Any steps in the process of ‘returning to Country’ for the Ngadjuri are also steps toward promoting and protecting cultural diversity through strengthening Indigenous knowledge of sites, and facilitate Indigenous nation building. The applications of the GIS database will add to the ability of the community to self-determine issues related to their heritage. Self determination has been commonly cited as an important factor in Indigenous nation building (see for example Cornell 2006; Cornell and Kalt 1998), as well as being listed in the United Nations Declaration on the Rights of Indigenous Peoples, Article 3 (United Nations 2007).

Several Indigenous Australian authors have written about their desire for self determination (Dodson 1996; Fletcher 1994). Fletcher argues that self determination is key to the process of reconciliation (Fletcher 1994). Australia’s Indigenous population is the most economically disadvantaged of all sectors in the society (Altman 2000; Hunter 1999). The alleviation of poverty through the closing of the gap in employment outcomes between Indigenous and non-Indigenous Australians is a policy concern for the current government (Commonwealth of Australia 2008; Macklin and Rudd 2008). In a review of Indigenous policy in Australia, New Zealand, Canada and the United States, Cornell (2006:27) found that the refusal to incorporate Indigenous demands for self determination cripples efforts to overcome poverty in these groups. Additionally, it was found that Indigenous people
engaging in the design of their governing institutions and self-governance is the best way to avoid a ‘one-size-fits-all-approach’ which is likely to fail (Cornell 2006:27).

**Background to the Study**

The project transpired from the relationship formed during a fieldwork trip with the Ngadjuri community in October 2008, as part of the Ngadjuri Heritage Project, an ongoing working relationship between the community and Flinders University, under the direction of Associate Professor Claire Smith. During this week spent on Country with the Ngadjuri, an interest in conducting a project with the community was expressed by myself and the possibility of this, along with several potential topics were discussed. Community Elders Vincent Copley, Vincent Branson, Dr. Claire Smith and myself were a part of these conversations.

This research is first and foremost community based, a project that has been requested by the Ngadjuri to meet their specific aims. Through working with the Ngadjuri community, valuable insights regarding the negotiation process involved in collaborative projects have been revealed. The work has also forged a relationship between myself and the community which is highly valued and I hope will be ongoing.

**Location of the Study Area**

This project entails a landscape archaeological analysis of Ngadjuri country as defined by Tindale (1974). Ngadjuri traditional lands cover an area of approximately 30,500 square kilometres, extending north from near Gawler
(approximately 50 km north of Adelaide), to just east of Quorn in the northwest, while encompassing the towns of Koonamore, Outalpa and Olary in the northeast.

Figure 1.2. Map of Aboriginal Australia with arrow highlighting Ngadjuri Country, adapted from Tindale (1974).
Figure 1.3. Regional Map of Ngadjuri Country (Tindale 1974).
Figure 1.4. Ngadjuri Country with Towns and Major Roads.
Figure 1.5. Ngadjuri Country Environmental Provinces².

² This map is derived from information provided by Laut et al. (1977). Zone boundaries are approximated to illustrate general areas, but are not to scale.
**Environmental Background**

Ngadjuri Country encompasses three environmental provinces, as defined by Laut et al. (1977), including the Mt. Lofty block in the south, the Eastern Pastoral Province in the northeast, and the Flinders Ranges in the northwest (see Figure 1.5).

**Mount Lofty Block**

This region extends from Kangaroo Island in the south, to just north of Wilmington in the north (Laut 1977(3):1), encompassing the southern portion of Ngadjuri Country. Temperatures vary from cool to cold in winter and cool to hot in summer (Laut 1977(3):1). The average temperature at Clare, in the southern portion of the province, ranges from an average high of 29.7 and low of 13.4 degrees Celsius in January, to July highs and lows of 13.2 and 3.1 degrees, respectively (Bureau of Meteorology 2009).

Rainfall in the Ngadjuri portion of this zone ranges from 250-600mm annually (Laut 1977(3):1), with Clare receiving an average annual rainfall of 632mm (Bureau of Meteorology 2009). The majority the of rain occurs the winter months, with Clare averaging 81.7 mm in July, while in February, the driest month, typically receiving only 24.2mm (Bureau of Meteorology 2009).

This province is home to a well-defined region of uplands, which are bounded on the east and west by escarpments extending from south of Ngadjuri Country, to the Flinders Ranges in the north (Laut 1977(3):3). In the north of the province, narrow strike ridges with smooth rounded slopes are
separated by wide intermontaine plains leading into the Flinders Ranges (Laut 1977(3):3). Red duplex soils cover the portion of this region encompassed by Ngadjuri Country, with soil depth generally decreasing as slope increases (Laut 1977(3):3).

Due to clearance for farming and grazing, much of the native vegetation in this province has been removed (Laut et al. 1977(3):3). Much vegetation in the region was also harvested to facilitate the firing of steam engine rail transportation for the Burra mines (Davies 2005:7). Originally, much of the region would have been covered by blue gum and peppermint box (*E. odorata*) woodlands, however, today these are mostly found on stony crests and steep slopes (Laut et al. 1977(3):126). Only small remnants of the mallee vegetation associated with sandy soils, and the tussock sedge lands dominated by iron grass (*Lomandra* spp.), that would have occurred in the northeast remain (Laut et. al 1977(3):126).

**Eastern Pastoral Province**

This province extends from the Murray River in the south to the Lake Frome Plains in the north (Laut 1977(5):3), encompassing northeastern Ngadjuri Country. The climate is warm and dry, with short cooler winters and low rainfall that lacks seasonal patterning (Laut 1977(5):2). Yunta, in this region, exhibits average January highs of 32.6 degrees Celsius, and lows of 15.0 degrees, with highs and lows in July (the coolest month) ranging from 15.4 to 3.0 degrees, respectively (Bureau of Meteorology 2009). Average monthly
rainfall varies from 22.8mm in May (the wettest month), to 15.5mm in the
driest month of March (Bureau of Meteorology 2009).

Two main landforms, the Olary upland and the Lake Frome plains, form the
Ngadjuri portion of this region. The Olary upland is a broad low spur
extending east/northeast from the northerly trending Flinders Ranges (Laut
1977(5/6):3). The upland exhibits a high density of low, gently sloping
ridges, separated by intermontaine basins, with rounded granite hills
occurring in the north (Laut 1977(5/6):3). Red duplex soils cover the
footslopes, and due to surface run-off, large drainage depressions are
common (Laut 1977(5/6):3). The Lake Frome plain, north of the Olary
Upland, is part of a large drainage basin, with Lake Frome situated in its
centre (Laut 1977(5/6):3). Red duplex soils are common in the portion of the
plain adjacent to the Olary Upland. Vegetation in the area is severely
degraded due to grazing, however, with the exception of some introduced
weed species, the majority is natural in origin (Laut 1977(5/6):3).

Flinders Ranges Province
This province encompasses the Flinders Ranges and surrounding alluvial
fans, within the southern portion of which, northwestern Ngadjuri Country is
situated. Climate in the province’s south is warm and dry, with annual rainfall
of only 150 to 250mm. The fans are comprised of moderately deep red
duplex soils with surface stones and some sub-surface gravel (Laut et. al.
1977(5/6):101). Much of this region has been cleared of native vegetation,
yet bluebrush and saltbush communities, as well as some taller shrubs such
as native fuscia, birdseye and wattle are present in some areas (Laut et. al. 1977(5/6):101).

Figure 1.6. Map of Ngadjuri Country showing Major Perennial Watercourses.
Hydrology

Major perennial watercourses in Ngadjuri Country are generally north/south trending and include several rivers and creeks (see Figure 1.6). As most other surface water is intermittent, access to water would likely have been a constraining factor in seasonal mobility. Many researchers have noted the impact water courses and access to this resource has had upon Indigenous Australian society from the time of colonisation of the continent (see for example Bowdler 1977; Hiscock and Wallis 2005; Horton 1981, Smith 1993b, Veth 1989, 1995), to the more recent times (Pickering 1994; Ridges 2003).

Geology

Geologically Ngadjuri country is situated within the broader Adelaide geosyncline, generally considered an area of “gentle platform downwarp adjacent to rising basement areas” (Parkin 1969:81). The geomorphology of the region is characterised by “undulating intramontane basins with red duplex souls, separated by low but distinct northerly trending strike ridges” (Laut et al. 1977). Areas of major topographic relief include the Tothill, Porcupine, and Bendleby Ranges (SASOSE 2005:9). The average sedimentation rate in this region is approximately one foot per 10,000 years; a relatively low rate when compared to other South Australian regions, some of which exhibit a sediment accumulation rate of twice the Adelaide Geosyncline (Parkin 1969).
Figure 1.7. South Australia Geology from Parkin (1969) Showing Approximate Location of Ngadjuri Country (not to scale).
**Previous Archaeological Work in the Area**

Numerous archaeological projects have been conducted in the current study area, through a combination of consultancy-based surveys, research-driven projects, and work conducted by the Aboriginal Affairs and Reconciliation Division (AARD). As a division of the State Government of South Australia, AARD is the repository of information regarding Ngadjuri archaeological heritage sites. According to AARD, 71 reports regarding Ngadjuri heritage had been submitted to the division between 1977 and 2009 (see Appendix A). The AARD report list excludes numerous accounts from early anthropologists and other scientists regarding Ngadjuri material culture, many of whom took a particular interest in the Panaramitee style rock art of the region (see Mott 1998:5-7 for a review of early work). Though not inclusive of all early works in the area, the AARD report list illustrates that work on Ngadjuri Country is dominated by projects that are development driven.
Table 1.1. Ngadjuri Heritage Reports held by AARD.

Much of the data employed in this study was derived from archaeological surveys conducted by private consultants. This work is useful as all site types are typically recorded in such projects, providing an accurate picture of the range of archaeological sites in a particular locale. The drawback of such projects is that they are by nature confined to the specific area of proposed development and its immediate surrounds, often resulting in patchwork of areas which have been surveyed, surrounded by those that have not (see for example Lower-Eskelson and Stash 2006:45).

Heritage reports for the study area that are not development-driven are compilations of heritage data for particular sub-regions, such as the Barossa
Valley (Chilman 1990; Coles 1994) or Plumbago Historic Reserve (Nobbs 1978). These reports are also useful in the sense that they typically provide an overview of all site types (Chilman 1990; Coles 1994), or a more detailed look at one site type (Nobbs 1978) in the area of the study. Research projects and theses provide a depth of analysis that development-driven work usually does not, however, much of the research in this area has been limited to studying a particular site type, such as rock art (Mott 1998; Nobbs 1995) and always within a smaller sub-region of the Country (Smith 1980).

At the time of writing, two Ngadjuri community-driven reports were held by AARD. One project entails work in collaboration with Flinders University in which two individuals were removed from a burial site that was under threat due to erosion (Blau et al. 2004), while the other consists of a project to documenting and nominating sites of national significance to the Register of the National Estate (Anderson 2000).

Previous archaeological work has generated the documentation of 307 sites within Ngadjuri Country, however, locational information for some sites was unavailable due to their presence in areas subject to non-Ngadjuri Native Title claims\(^3\), therefore, only 265 are included in this study. Documented site types include, open sites; rock engravings; rock paintings; stone arrangements; water holes; quarries; burials; a scarred tree; a significant tree and isolated lithic artefacts. A limited number of hearths in the area have been dated, providing a preliminary timeframe ranging from over 10,000 BP to the present (see Nobbs 1983; Smith 1980). This research has taken the

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\(^3\) This site information would be provided by AARD upon the consent of those parties lodging the claims, however, the Ngadjuri chose to continue the project without the remaining sites.
information derived from this previous work in the area to provide a picture of how the Ngadjuri landscape was used in the past. In addition, the South Australian Museum collections contain some material from Ngadjuri Country, which should have associated site forms held at AARD.

Knowledge of the Past Ngadjuri Landscape and Indigenous Nation Building

The Ngadjuri were one of the first Indigenous groups in South Australia to have contact with Europeans, with the first European explorers entering Ngadjuri country in 1839 (SASOSE 2005). By the 1840s, European colonists were moving north into Ngadjuri territory in search of pastoral land and mineral resources (SASOSE 2005). The 1840s and 1850s was a time of active resistance by many Ngadjuri as they saw their land and lifeways under threat (SASOSE 2005). This period saw the development of the mining towns of Kapunda (1844), and Burra (1845), alongside the continued expansion of pastoralism in Ngadjuri Country (Birt and Copley 2005:262). By 1851 the regions European population had grown to 4,129 in Burra, 1,283 around Clare and 406 to the north of these areas (Birt and Copley 2005:263). Many Ngadjuri began ‘working’, though often unpaid, on local farms during this time as a means of survival (SASOSE 2005). Tindale (1974) notes that the Ngadjuri were dispersed in the early days of white settlement and although the exact timing of the displacement is unknown, they were largely absent from their country by the early 1900s. Some people moved into townships with others joining the Adnyamathanha (their neighbours to the north), while others moved to missions (SASOSE 2005). Several members
of the Ngadjuri community ended up at the Point Pearce mission (SASOSE 2005).

When looking at a severely displaced community such as the Ngadjuri, the question arises, how can such a community facilitate the reacquisition of cultural knowledge associated with ‘returning to Country’ and Indigenous nation building? Returning to Country entails numerous aspects including the re-gaining and control of cultural knowledge, the management of one’s own heritage, and access to land rights (Birt and Copley 2005). This process is also an integral part of building an Indigenous nation.

Archaeology is in a unique position to assist in the re-acquisition of knowledge as archival sources regarding the Ngadjuri are limited. Regional archaeological studies can employ data such as the type and location of material cultural remains in relation to landscape features uncovering socio-cultural relationships. Though some aspects of traditional Ngadjuri culture have been lost due to European colonisation, through archaeology we can re-gain part of this information.

This project is also integral to facilitating Ngadjuri control of this cultural knowledge. The GIS database will be provided to the community in the open source program, ArcReader. By providing the GIS database in a format that can be accessed by a layperson, information previously held only by the State will be under Ngadjuri management, to be applied and accessed at their discretion. The GIS database can serve a variety of heritage
management goals (see Kyem 2000) as it will enable the community to access information about all archaeological sites documented prior to the time of writing, in any given part of their traditional lands, without requesting the information from another party.

Limitations of the Study
This research was subject to a number of limitations, due to a variety of factors. The main limitations include discrepancies regarding Indigenous Australian land boundaries, a lack of archaeological data for much of the area, a lack of detail and consistency in previously recorded site forms and recent activities that have resulted in a loss or obstruction of archaeological data. Each of these limitations and the extent to which their effects have been mitigated in this study are discussed in Chapter 3.

Discussion
This project is a community-based endeavour that has been undertaken as a component of the Ngadjuri return to Country. This research explores what the nature and distribution of archaeological sites on Ngadjuri Country can tell us about past use of the landscape; how this information and the control over it can assist the Ngadjuri process of returning to Country; and how this relates to the broader issue of Indigenous nation building. The following chapter reviews relevant background literature, setting the stage for the project within the wider archaeological discipline.
Chapter 2
Literature Review

Introduction

For many Indigenous Australians the term landscape “incorporates relationships between place and people, both in a spiritual sense and from the perspective of the resources which the landscape provides” (Ross 1996:9). A landscape analysis is therefore considered a relevant and culturally appropriate approach to understanding more about the history of the area. This chapter reviews relevant background material and places the project within the broader academic literature.

Projects on Ngadjuri Country

Though several projects have been conducted on Ngadjuri Country, none have been designed to provide the depth of analysis or breadth of scope of the current undertaking. Much of the early work was conducted by anthropologists or other scientists with references to material culture covering limited areas, often with a specific focus on rock art (see for example, Basedow 1914; Campbell 1925; Hosking 1926; Tindale and Mountford 1926; Mountford 1927, 1929, 1957). More recently, a number of research projects have likewise retained the rock art focus (Nobbs 1983; 1995; Nobbs and Dorn 1993; Mott 1998), with only one systematic research-driven survey documenting all site types having been conducted (Smith 1980). Numerous consultancy-based projects have been conducted in Ngadjuri Country. These surveys however, are by nature confined to reporting on the material culture of a limited area (the area of potential impact due to development
activities) and its immediate surrounds, and while they provide invaluable data, time constraints in the private sector often limit the depth of analysis attained. Only one previous project synthesising data for the entirety of Ngadjuri Country, had been conducted at the time of writing (Anderson 2000). This project sought to provide nominations of sites of national significance to the Register of the National Estate, rather than conduct a detailed analysis of all sites (Anderson 2000:3). Several projects have been conducted in the area since Anderson’s (2000) work. Hence, the current research has incorporated new data as well as conducted a detailed landscape study, the first in this area.

**Indigenous Displacement**

Though deciding on a definition of ‘Indigenous’ that encompasses the diversity of the world’s groups is problematic, Keal (2003:16) estimated there to be at least 250 million Indigenous peoples living in all inhabited continents of the globe. Due to colonisation, all of these peoples are, to varying degrees, living within the broader political and social constructs of a society other than the one they identify with as an Indigenous person (Keal 2003). It should be noted that it is not only the European Empire that has colonised other peoples. The Roman, Ottoman, Japanese and Chinese Empires as well as the Spanish and Portuguese, among many others (Keal 2003:42-43), have expanded their rule to encompass other peoples at various times and many see the occupation of Tibet by China as a modern example (Sautman 2006; Sheperd 2006). A commonality of these ‘Empires’ is a resulting desire
amongst oppressed peoples to regain or establish self determination (Keal 2003:43).

Globally, the displacement of Indigenous peoples as a result of colonisation has been well documented (see for example Dyck 1985; Lilley 2006; McNiven and Russell 2005; Paterson 2008; Smith 1999c). Though individual circumstances vary, typical experiences range from forced assimilation, removal from ancestral lands and denial of land rights, death by diseases to which Indigenous peoples had no immunity, and outright massacres. The displacement of Indigenous peoples, during the British diaspora, was massive in scale, and in many parts of the world the residual circumstances continue to affect the lives of groups and individuals today (Cornell 2006; Hemming and Trevorrow 2005; Moses and Thoma 2006).

Indigenous people were typically considered the ‘Other’, a being in many ways different from the colonisers and in light of the social Darwinism of time, lower on an evolutionary scale (Byrne 1996; Olaster 1908). This concept and its ties to early archaeology, are crucial for understanding the difficulties involved in re-connecting to Country because it is directly related to the displacement and disenfranchisement of individuals that removed Indigenous peoples from their ancestral homelands and regarded their culture as a relic of the past. Typically, the elements of Indigenous Australia that were noteworthy to colonisers were movable material items, while intangible heritage was rarely documented (Ross 1996:10). This is likely a direct result of the lack of refined culture that new settlers perceived in the ‘Other’. Early
European settlers often viewed Australia’s Indigenous inhabitants as people who wandered aimlessly around the landscape, in a seemingly endless search for food and shelter (Ross 1996). This view may have made the forced removal of Indigenous people from their lands easier to justify. The result of centuries of policies rooted in this perception is a loss of not only land rights but also intangible aspects of culture that were discouraged by government-sponsored initiatives (Mattingley and Hampton 1992; Moran 2005).

Like many Indigenous groups worldwide (Clifford 2001; Perry 1996), the Ngadjuri were severely displaced through the processes of European colonisation (SASOSE 2005). With explorers entering Ngadjuri country by 1839, the latter were one of the first South Australian Indigenous groups to encounter Europeans, and were largely removed from their traditional lands by 1900 (SASOSE 2005). Hercus (1994:147) suggested that by 1994 no one identifying themselves as Ngadjuri remained and asserted that due to their residence at the Point Pearce mission, the descendants of the Ngadyuri [sic] identified themselves as Narungga. The following year, however, Ngadjuri descendants re-asserted the Ngadjuri identity, by forming the Ngadjuri Walpa Juri Lands and Heritage Association (see Birt and Copley 2005), which is now recognised by the State Government under the *Aboriginal Heritage Act 1988* (SA). Several people were removed from their land and sent to missions, particularly that at Point Pearce, however, many acknowledge both their Ngadjuri and Narungga roots, as well as some ties to other groups such as the Ngarrindjeri (SASOSE 2005).
In Australia, just as in many other parts of the world, missions precipitated massive social changes for Indigenous people (see for example Mattingley and Hampton 1992; Peel 1967; Sutton 2003a). Though missionaries were often motivated by humanitarian issues, the introduction of the European colonist’s Christian religion and lack of familiarity with, or respect for, traditional customs had far reaching and devastating affects on Australian Indigenous culture (Lydon 2002; 2005; Mattingley and Hampton 1992). Life on missions often entailed the suppression of rituals such as initiation and the replacement of traditional song cycles with Christian hymns (Mattingley and Hampton 1992:175). These and other facts of mission life contributed to a loss of traditional cultural knowledge and practices that some groups, such as the Ngadjuri, are now in the process of re-connecting with as a component of their ‘return to Country’.

Returning to Country may entail a variety of experiences for different individuals or groups, however, it typically entails a re-connection with aspects of culture that may have been neglected for a variety of reasons, as well as a re-gaining of control over one’s own heritage (Birt and Copley 2005). This can include spending time on Country, gaining land rights, re-gaining cultural knowledge and the passing on of this knowledge to younger generations (Birt and Copley 2005; Vincent Copley and Vincent Branson pers. comm. 2009). Though some early ethnographic information regarding the Ngadjuri was recorded, the sources are limited. Archaeology has the ability to fill in some of the gaps in the archival record, providing a more complete picture of Ngadjuri history. Through archaeology, aspects of
Ngadjuri culture and social organization that were disrupted by the process of colonisation can be revealed. A landscape approach is particularly useful as it can provide a holistic view of the way Ngadjuri Country was used in the past by combining site locational information with environmental and historical data.

**Landscape Archaeology**

Landscape archaeology is a term that is not easily defined. A search of the literature reveals numerous explanations, ranging from references to the early quantitative and processual works of Binford (1978, 1980), looking at ‘settlement systems’, to the post-processual phenomenological interpretations of Tilley (1994, 1999, 2004), with a number of other authors shying away from clearly defining what ‘landscape’ entails altogether. Most of the discord is rooted in defining the level to which the term can be understood archaeologically, which in part is related to the term having been borrowed from another discipline. Geographers trace landscape as a cultural concept to the Renaissance, a period when European land use changed to create more visible patterns in the landscape (Cosgrove 1984:1).

Cosgrove (1984:13) suggested that a landscape is differentiated from a region or an area by virtue of the subjectiveness of human experience. In other words, landscape is not only what we can place on a map, but also entails the more intimate way in which we perceive ‘places’; with the use of the term ‘places’ rather than ‘locations’ an important one. According to Thomas (2001:172), “place is a relational concept”; it is our association with
places that make them such. For example, this ‘place’ is where I was born, or this is the ‘place’ where I remember dancing under the stars. Thomas (2001:172) proposed the idea of landscape as a “network of related places”, that through life’s occurrences, are incorporated into our stories. He further suggested that landscape could be described as “the series of places through which people’s life histories are threaded that help them to give account of their own identity” (Thomas 2001:172). Importantly, this concept of landscape focuses on the individual, a level of resolution that is difficult to attain archaeologically. However more broadly, the cumulation of the various ‘places’ of a society have been used to identify wider socio-cultural patterns such as seasonal mobility, inter-group interaction and resource exploitation.

In Britain, the study of archaeological ‘landscapes’ was greatly advanced in the 1950s when Crawford combined the use of aerial photography and archaeological fieldwork in regional studies with the publication of *Archaeology in the Field* (Crawford 1953:49). Though numerous projects that would now be considered landscape archaeological studies have been conducted throughout the past several decades, the term did not enter the archaeological literature until the 1970s and it was at least a decade later that it made a common appearance in academic writing (David and Thomas 2008:27). Prior to this, studies beyond the level of the site were often termed regional, as some still are today (see Kanter 2007; Kowalewski 2008).

On the other side of the Atlantic, early regional studies include the anthropological work of Steward (1937, 1938) in the Great Basin and
southwest of the US. Steward used regional models to analyse what he termed ‘human ecology’, which considered features of the environment and the way it was exploited by humans to study the “resulting adaptations of human behaviour and institutions” (Steward 1938:2). Steward’s theory went on to become known as cultural ecology and is typically associated with processual archaeology. Though often criticised for its environmental determinism, cultural ecology tied only ‘core’ aspects of culture to environmental factors. According to Steward (1973:36):

…cultural ecology presents both a problem and a method; the problem is to ascertain whether the adjustments of human societies to their environments require particular modes of behaviour or whether they permit latitude for a certain range of possible behaviours.

In the USA, Binford’s (1978, 1980) work largely followed a similar approach, combining quantification and deductive logic with anthropological studies. Binford (1978) looked at site formation processes and the relationships between in-situ artefacts, site function and broader regional location, as well as subsistence settlement systems, suggesting that environmental factors determine the strategy a given group will manifest (Binford 1980). This processual approach, often known as the New Archaeology, came under criticism in the 1980s and 1990s for its perceived focus on materialism and inadequacy in explaining cultural and social systems (Hodder 1982:49). New approaches cited the need for a framework to highlight the human, cultural, and social dimensions of landscape (Cosgrove 1984; Fisher and Thurston 1999; Knapp and Ashmore 1999).
This division in basic epistemologies is highlighted in the following passage:

All too often the prehistoric landscape is studied for evidence of settlement and subsistence. This is the task of ‘landscape archaeology’. Monuments associated with ritual and ceremonial are usually studied separately, and these are the province of ‘social archaeology’. Such a division of labour is faint-hearted, and ultimately it is impossible to maintain. (Bradley 1997:216)

In general, the debate generated through the emergence of post-processual approaches has created a more robust landscape archaeology. However, this is not to say that the various theoretical approaches to its study are clearly defined. Landscape archaeology as a sub-field of the larger discipline is renowned for the variety of forms it can take. In fact, what defines landscape archaeology today is greatly influenced, not only by the epistemological background from which it is approached (Fleming 2006), but also the individual practitioner and context (David and Thomas 2008:28). As Taçon stated, “landscape like beauty, is in the eye of the beholder” (1999:34).

As noted by David and Thomas (2008), contemporary landscape archaeology provides a framework through which to view the past which goes beyond ‘environmental archaeology’. It “concerns not only the physical environment onto which people live out their lives but also the meaningful locations in which lives are lived” (David and Thomas 2008:38). This distinction is particularly important when studying Indigenous landscapes, as the typically western concept of retaining varying levels of separateness from the landscape differs from that held by Indigenous Australians, where
“patterns of land use, as well as notions of personal identity are closely linked to social constructions of land” (Smith 1999a:189).

Several remarkable projects have been conducted in Australia using a landscape approach (see for example Bradley et al. 1994; Ridges 2003; Taçon 1999; 2008 among others). In the Pilbara region of northwest Western Australia, Paterson and Wilson (2009) conducted a GIS-based spatial analysis of the archaeological landscape of a pastoral station. The project documented locational data for structures, artefacts and engravings on the station and conducted a detailed analysis of motif type and location, contrasting this with historical information. In a detailed analysis of contact period rock art motifs, evidence of Indigenous familiarity with and possibly involvement in, the early colonial pastoral and pearling industries of the region was revealed. The authors contend that when this information is combined with the analysis of the remaining archaeological data from the sites, it may provide evidence of “Indigenous perceptions of contact” (Paterson and Wilson 2009:109).

In a regional analysis of northwest central Queensland, Ridges (2003:380) plotted the spatial patterning of various art motifs using GIS and found several interesting clusters of motif types that were grouped into a general northeast/southwest division; this division was also found to be associated with drainage patterns, which were typical travel routes for Indigenous Australians. Ridges hypothesised that the “division in motif distributions is probably related to the movements of people on either side of the drainage”
(2003:380). David and Cole (1990) had previously suggested that rock art in semi-arid environments would reflect a level of similarity over broader areas, as people maintained extended relationships between widely dispersed small groups in order to minimise the effects of adverse environmental conditions as noted by Gould (1980); Ridges found that the art of northwest Central Queensland supported this proposition. Here, motifs common in central Australia were found to occur only on the southwestern (or central Australian) portion of the study area, a finding that the author suggested might have strengthened relationships between the two regions (Ridges 2003:281).

However, it is not only the landscape analysis of rock art that has led to insights regarding social systems. Pickering (1994), for example, combined a study of the physical landscape (defined as the spatial and temporal arrangement of environmental phenomena), subsistence-settlement landscape (defined as the spatial and temporal distribution of archaeological sites), and the social landscape (gleaned from ethnographic information) to illustrate the cultural landscape of the Garawa, in northern Australia. He argued that the cultural landscape is the manifestation of all three of these landscape types. In the Garawa example “the material world in which most of their social, spiritual, economic and domestic lives are contained, shows repeated articulation with the major topographic and biogeographical features of the landscape” (Pickering 1994:157). This work highlights the interrelatedness of the sociocultural aspects of a society with the land and illustrates the valuable information that can be gained through landscape studies.
Cultural Mapping

Though the project described herein relies primarily on environmental and historical data, in conjunction with site location, to provide information regarding the way the landscape was used in the past, it also provides a necessary baseline of information that could later be used to produce a cultural map of Ngadjuri Country. A project researching archival sources regarding the Ngadjuri is currently being conducted (Halliday in prep.) and the use of the results of this project, together with Halliday’s findings, will provide a wealth of information for building a cultural map of Ngadjuri Country.

Cultural mapping, as a method of identifying and managing cultural resources and illustrating connections to land for legal purposes, began in Canada and Alaska during the 1960s, spreading to other regions in the 1990s (Chapin et al. 2005). According to Poole (1995:2), “urgent problems facing Indigenous peoples are how to get others to respect their land rights, how to demarcate those lands, and how to monitor and protect them”. The production of maps portraying traditional knowledge and expressing previous patterns of occupancy can assist in addressing these problems (Poole 1995). Many Indigenous groups have begun using cultural maps as an instrument to re-name locations in their language and to reclaim traditional lands (Johnson et al. 2006; Poole 1995).

Projects investigating cultural landscapes in Australia include Byrne and Nugent’s (2004) work in NSW; Harrison’s (2004) work, also in NSW; Greer
and McIntyre-Tamwoy’s work in the Cape York Peninsula (Greer et al. 2002); Harrison’s work in the Kimberley (Harrison 2002); Clarke’s (2000, 2002) work on Groote Eylandt; and Pickering’s (1994) work in northern Australia. Each incorporated the additional element of employing information gained from Indigenous informants in the production of maps, effectively creating a ‘cultural map’.

A cultural map differs from a typical map in the sense that it incorporates personal and community aspects of culture (often intangible) that are considered important by the group whose culture is being mapped. Ridges et al. (2008) presented a method of cultural mapping termed Value Interest and Priority or VIP. VIP lays out steps for engagement with a community, the elucidation and prioritisation of heritage areas of concern to the community and formulation of management strategies to address these concerns. This innovative method has the ability to assist both heritage managers and communities to identify and protect heritage through its collaborative approach.

Cultural mapping themes are varied and can include anthropological, archaeological, linguistic, musicological, sociological, genealogical, topographic and botanical components (UNESCO 2009a). Just as the type of information can change from project to project, so can the format in which the data is configured. For example, typical designs can include items such as maps, diagrams, photos, satellite imagery, statistical databases and other forms of data (UNESCO 2009a).
GIS, Archaeology and Heritage Management

Geographic Information Systems (GIS) has transformed the way archaeology is conducted. GIS is particularly useful in landscape studies as it can combine site location data with the environmental and topographical characteristics of an area, analysing volumes of data that would have previously been unwieldy (Haines-Young et al. 1994:4; Longley et al. 2005:12). GIS also facilitates the simultaneous combination of layers of information that allow landscapes to be interpreted in new ways (Wescott 2000:1). This combination to layers of data can also assist in predictive modelling (see for example Bevan and Conolly 2004; Vaughn and Crawford 2009; Warren and Asch 2001 among many others). Ridges (2006) has created the Aboriginal Sites Decision Support Tool (ASDST) which assists in the creation of predictive modelling to assist in conservation at the regional scale, illustrating that the applications of predictive modelling extend beyond its research potential to also serve as a conservation and regional management tool.

In addition to its potential for data analysis and large-scale management, GIS is also an invaluable tool in community-based heritage management, which has been employed by several Indigenous groups (Johnson et al. 2006; Kyem 2000). The transfer of GIS skills and technologies to Indigenous and local communities, rather than it remaining a tool for the powerful, is a main objective of a movement referred to as Participatory Participation Geographic Information Systems, or PPGIS (Kyem 2000; Rambaldi et al. 2006; Shepperd 2005). In this sense the current project could be considered an undertaking
in PPGIS. GIS is not only employed as an analytical tool in the current project, but the database will remain with the community for future use. The management applications of the database are discussed in Chapter 5.

Cultural Heritage Management

In countries such as Australia and the USA, a large amount of work in cultural heritage management is conducted by archaeologists working in the capacity of heritage consultants (McCarthy 2008; Smith 2004a). Legislation forms the framework within which the cultural heritage manager must work. Many researchers have noted that the bulk of writing and legislation regarding the concept of cultural heritage is firmly rooted in, and biased toward, western thought and cultural concepts (eg Byrne 1991; Pearson and Sullivan 1995; Shepherd 2006; Smith 1993a, 2006). In Australia, the 1960s and 1970s saw legislation relating to Aboriginal heritage enacted largely because of the pressure exerted by archaeologists to protect sites for their research potential (Ross 1996:11). Early legislation did typically not consider what was of importance to Indigenous people, but what was deemed important by and “for the archaeologists and scientists of the future” (Ross 1996:11).

The first Burra Charter was adopted by the International Charter for the Conservation and Restoration of Monuments and Sites (ICOMOS) in 1979, but it was not until 1999 that the criteria for ‘social significance’ was introduced (ICOMOS Australia 1999). Though as a charter its articles serve as a guideline for Best Practice rather than a legislative requirement, the
Burra Charter has influenced the way that archaeology is practised in Australia, particularly in its identification of social values. Social values are typically recognised by insiders rather than identified by outsiders, because of the way they express and reinforce traditions (Byrne 1991; Davidson 2008). The use of social significance as a method of site evaluation therefore generally necessitates the involvement of Indigenous community members, removing an element of control from the heritage manager. The introduction of social value as a criterion for assessing heritage also creates an avenue for local intangible values to be included.

Even in light of all the changes that have arisen in heritage legislation, in South Australia a government agency manages and retains the ultimate decision-making power regarding cultural heritage (Wiltshire and Wallis 2008). Though the Victoria Aboriginal Heritage Act 2006 and the Queensland Aboriginal Cultural Heritage Act 2003 no longer leave the Minister in the role of final decision-maker, this is not the case in South Australia, where Section 12 leaves a government Minister with the ability to order a ‘consent to destroy’ for any site they see fit.

Hemming and Trevorrow (2005:244) have referred to the Aboriginal Heritage Act 1988 (SA) retaining the consent to destroy at the Minister’s discretion as legislation which leaves the state with ability to “destroy people’s sites and beliefs” as a “modern day type of genocide”. Ngadjuri Elders have also noted their concerns with the Minister retaining the ‘consent to destroy’ and have suggested that they would like to see direct discussions between the
developers and Indigenous groups whose heritage is at stake, in an attempt at reaching an agreement before consent to destroy is given (Vincent Branson pers. comm. 2009).

Interestingly, at the time of writing, the *Aboriginal Heritage Act 1988 (SA)* is under review. The immediate future will tell whether South Australia’s heritage legislation will facilitate further Indigenous involvement or retain ultimate control. Ngadjuri Elder Vincent Branson has been involved in informing South Australian Aboriginal communities of the pending revision in heritage legislation, as the State government has requested input from Indigenous communities (Vincent Copley and Vincent Branson pers. comm. 2009). Whether or not this is the beginning of a more effective cooperative relationship between Indigenous groups and the larger governmental heritage bureaucracy remains to be seen.

Although this project will in no way alter the overarching structure of the management of heritage, it will contribute to the discussion of ‘who owns the past’ (McBryde 1985) by returning an element of Ngadjuri heritage to the community. This project will not only provide information gained through an archaeological landscape analysis, but it will also return a measure of control of information, in the form of the GIS database, back to the community. The potential applications for this data are explored in Chapter 5.


**Indigenous Nation Building**

In an attempt to regain elements of the cultural and societal control that was lost through colonialism, several Indigenous groups in various parts of the world are engaged in political movements and nation building (Cornell and Kalt 1998; Miguel 2004; Yashar 1999). Self determination and economic development along with social, cultural and political outcomes are key to Indigenous nation building (Cornell and Kalt 1998). Approaches to nation building vary depending on the Indigenous groups involved, and the broader political constructs of the nation they are situated within (Cornell 2006).

Several general themes form the literature regarding Indigenous nation building and decolonisation including, control over cultural heritage; land rights; transmission of knowledge; intellectual property; repatriation; identity; use of language; alleviation of poverty; and self determination (see for example Birt and Copley 2005; Cornell and Kalt 1998; Fforde 2004; Lambert-Pennington 2007; May et al. 2005; Niezen 2003; Rubertone 2008; Smith 1999c; Smith and Jackson 2006; Smith and Wobst 2005; Truscott 2006 among others [see Figure 5.1]). In the case of research being conducted with Indigenous communities, the sharing of its benefits is a concern that has been regularly voiced (Smith and Jackson 2006; Ross and Abbott 2004). This project has the ability to assist the Ngadjuri in a number of these general themes, which are explored further in chapter 5.
The Ngadjuri Case Study

Learning About The Ngadjuri Through Landscape Archaeology

The modern view of landscape archaeology acknowledges that not only does the landscape shape us, but also we shape it, both physically and conceptually (Knapp and Ashmore 1999:4-9). Though archival information will be integral to the Ngadjuri journey of returning to Country, archaeological field survey and landscape analysis hold a unique position in the process. While we cannot turn back the clock and ask Tindale to clarify a specific hunting location or tool manufacturing technique, or request that an early settler or explorer give more detail regarding where Indigenous people were seen camping or what they were eating, we can still obtain some of this information through the archaeological record. Moreover, using a landscape approach, we can provide pieces of the cultural puzzle without the destruction associated with excavation. Through first analysing all of the archaeological information available for the area from a landscape approach, more fully informed decisions regarding excavation locations can be made in the future, if the occasion arises.

Discussion

A review of relevant literature shows that although Indigenous populations worldwide have suffered, and many continue to suffer, through colonisation and its associated effects, there are several steps that can be taken toward addressing the injustices of the past. Though history cannot be changed, through an acknowledgement of what has occurred, and with cooperation, a more equitable future can be produced. Collaborative research can benefit
both researchers and Indigenous populations (see for example Clarke 2002; Ferguson 1996; Greer et al. 2002; Smith 2004b; Zimmerman 1995) and archaeology is in a unique position to provide data that is unavailable from other sources. This is particularly helpful in the case of groups such as the Ngadjuri, who are seeking additional cultural knowledge, but regarding whom little ethnographic data was collected.

A landscape approach is a particularly useful method of analysis as it not only incorporates an element of the holistic worldview held by many Indigenous peoples, but also because many projects have shown its ability to uncover socio-cultural patterns. The use of GIS in conducting analysis not only increases the amount of data which can be employed, but also provides a resulting database that can provide a variety of practical applications for communities, thus returning an element of knowledge, and power. The following chapter outlines the methods used in the landscape analysis.
Chapter 3
Methods

Introduction
This section outlines the methods used in this research. These include Ngadjuri control of aspects of the project and other ethical considerations as well as the methods used in landscape analysis. Though some limitations in the available data were encountered, these were mitigated to the extent possible and are not seen as a detriment to the final product.

Ethical Considerations
Conducting research with any Indigenous group requires certain ethical considerations (Australian Archaeological Association 2004; World Archaeological Congress 1990). Of particular concern is community involvement in research. The way archaeology is practised, particularly in Australia, has changed greatly in the past several decades, particularly with the increase in community based projects. Greer et al. (2002:3) define a community-based project as one that is interactive rather than reactive, with the research design and methodology receiving input from both the researcher and the community. Community based projects seek to empower communities by assisting in the construction of their local identity (Greer 1995:231). An important research of this project is the fact that it was designed in collaboration with the Ngadjuri community, with the results to be used as they see fit. As a community-based undertaking, the Ngadjuri had a high level of control over the project from its inception until its completion.
An important consideration from the beginning of this work was that the resulting GIS database will remain in the control of the community after the completion of the project. The potential role of GIS as either a tool of empowerment or disenfranchisement has been explored by many authors (Harris et al. 1995; Kyem 2000; Obermeyer 1995; Rundstrom 1995). Therefore, it was particularly important that the information was provided to the community in a manner that a layperson could access and that the community was involved in decisions regarding what the GIS database would entail. As a collaborative project, not only does this research retain scientific value through what it adds to our archaeological knowledge of the region, but also social, cultural and practical value for the community.

Although this project was chosen by the Ngadjuri community, there were still several ethical aspects to the project that required attention. An ethics approval application was submitted to both the Yunggorendi First Nations Centre and the Social and Behavioural Research Ethics Committee of Flinders University (see Appendix B). The purpose of this application process was to ensure that the research was conducted in an ethical manner and that all participants were fully aware of, and in agreement with, their role the undertaking.

**Data Sources Employed**

The sources of data employed in this study include, site forms; GIS data layers; conversations with Ngadjuri community members; reports and theses.
• Site Forms

A total of 307 sites have been documented in the project area. These sites include 295 for which records are held at AARD, and 16 that were documented by the Ngadjuri and Flinders University students as part of the Ngadjuri Heritage Project. Of the 307 sites, information for 46 was unavailable for this undertaking due to their location in areas subject to Native Title claims by non-Ngadjuri groups. In the case of non-Ngadjuri Native Title claim areas, only the sites for which the data was already in the community’s possession are included. Hence, for the purposes of this project 265 sites were analysed.

• GIS Data Layers

Several layers of additional data were added in ArcGIS to enable further analysis. These include, a major and minor watercourses layer; a lakes layer; a waterholes layer; a vegetation/environmental data layer (Figure 3.1); a Digital Elevation Model (DEM) layer (Figure 3.2); a slope layer; a roads layer; a populated places layer; a layer of surveyed areas and a layer approximating Tindale’s (1974) boundary of Ngadjuri Country. An additional layer of topographic data for the region was also added. Though not used in analysis, this layer will facilitate the production of field maps by the community in the future.
Figure 3.1. Map Showing Vegetation Data Layer.

Vegetation Data for Ngadjuri Country
Figure 3.2. Map Showing Digital Elevation Model.
• **Interviews and informal conversations with Ngadjuri community members**

Conversations with the Ngadjuri provided a wealth of information for this research. Topics of discussion included the reasoning behind the choice of this project over others; the use of such a project to the community; and its part in the broader process of returning to Country.

• **Reports (from AARD and the Ngadjuri community)**

Reports were a good source for cross-checking information that was unclear in site forms, such as the datum in which a site’s UTM’s were recorded.

• **Theses**

Three academic theses regarding aspects of Ngadjuri Country have been completed including, Smith (1980); Nobbs (1995); and Mott (1998). Smith (1980) conducted an intensive pedestrian survey of portions of Plumbago Station in the north of the region, documenting over half of the sites used in this analysis. Nobbs (1995) focused on rock paintings and their associated ethnographic evidence in the Olary Uplands, the same general region where Smith’s project area occurs. Mott (1998) investigated rock engravings in the Panaramitee hills. Each of these sources provided detailed information regarding particular areas and aspects of Ngadjuri material culture.
**Data Collection Methods**

**Site Data**

The majority of the site forms used in analysis were in the possession of Ngadjuri Elder Vincent Branson and provided to the author in April 2009. The Aboriginal Affairs and Reconciliation Division (AARD) provided the remaining forms in September 2009. Additional site recordation and locational verification was conducted during field trips with the Ngadjuri community between October 2008 and October 2009. These sites were documented by myself and other Flinders University students, along with Ngadjuri community members, as part of the Ngadjuri Heritage Project.

**GIS Layers**

The spatial data used in this research was downloaded from the Social Sciences GIS database at Flinders University. Table 3.1 shows the source for each data layer.

**Conversations with Ngadjuri**

The oral information given by the Ngadjuri was collected over a period spanning from October 2008 to October 2009. This data was collected during both informal conversations, and interviews. No recordings were taken, however, all information gained from the community considered relevant to the thesis was recorded into a field notebook.
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<tr>
<td>Roads</td>
<td>Geoscience Australia</td>
<td>1:250,000</td>
<td>National Geoscience Datasets</td>
</tr>
<tr>
<td>Populated Places</td>
<td>Geoscience Australia</td>
<td>1:250,000</td>
<td>National Geoscience Datasets</td>
</tr>
<tr>
<td>Ngadjuri Country Boundary</td>
<td>Digitised from Tindale (1974)</td>
<td>n/a</td>
<td>n/a</td>
</tr>
<tr>
<td>Topographic Data</td>
<td>Geoscience Australia</td>
<td>1:250,000</td>
<td>National Geoscience Datasets</td>
</tr>
</tbody>
</table>

Table 3.1. Source of GIS data layers.

Methods of Analysis

Site Data

Information derived from site forms was entered into an EXCEL spreadsheet. The spreadsheet included the following 13 fields, AARD site number; AARD site name; topographic map sheet; site type; easting; northing; datum; date recorded; property name; additional information (regarding the nature of the site); site area; site recorder; and other (see Appendix C).

Site locations had been recorded in a variety of formats including latitude and longitude and Universal Transverse Mercator (UTM) in a variety of datums. Therefore, it was necessary to convert the various locations to a common
datum (GDA94). Locations in latitude and longitude were converted using Geoscience Australia’s online conversion system, which calculates the conversion with Redfearn’s Formula to an accuracy of less than a 1mm change in location (Geoscience Australia 2009). Sites with UTMs in other datums were converted using convertcords 3.0 software, which calculates the conversion within one meter of accuracy. This open source program is downloadable at http://adunk.ozehosting.com/software/converrcoords.html.

Once site locations were in a common datum, the spreadsheet was converted to a .csv file, which was uploaded into the ArcGIS database. The easting and northing fields were then plotted onto a base map from the .csv file. The resulting layer was then saved as a .shp file, with the fields of the spreadsheet forming the fields of the attribute table⁴ (Figure 3.3) associated with each site in the GIS database. In this case, if a specific site is selected on the map, all of the information associated with that particular site in the original spreadsheet will be available.

---

⁴ All layers in the GIS database have an associated attribute table, comprised of information specific to that layer. In the case of the sites layer, all information from the original spreadsheet can be viewed by opening the attribute table for that layer.
Figure 3.3. Screen Grab of Site Attribute Table with Specific Locational Information Removed.

GIS Analysis

Once the GIS layers were downloaded to the database, they were compared to site locations to carry out analyses. In the case of watercourses, the locations of lakes and water holes were added to both the major and all watercourses layer, to create more comprehensive layers of all of water sources. Using the Joins and Relates feature in ArcGIS, the resulting layers were then joined to the site location layer (Figure 3.4). This created the new layers, sites_major_water and sites_all_water, both of which were saved as .shp files. The attribute table for these layers provided information regarding the type of nearest water source, and its distance from each site.
The same process was carried out with the vegetation/environmental information layer, in which this layer was joined with the sites layer resulting in a site_veg layer, which was saved as a .shp file (Figure 3.5). On-site vegetation and environmental data were both accessed through this layer’s attribute table.
The DEM was used to determine the degree of slope of the sites. This was conducted through the Spatial Analyst extension, in which a surface analysis of slope was chosen to create the new layer, site_slope (Figure 3.6). Again all the necessary information was available in the attribute table of the new layer.
The roads, populated places, Ngadjuri boundary and topographic map layers were not specifically part of the analysis, but were useful in the production of maps, as they will be in the future.

Conversations with Ngadjuri

Information gained through conversations with the Ngadjuri Community informed both the project’s structure and methods, as well as the interpretation of aspects of the research. The Ngadjuri experience was compared with that of other Indigenous groups in similar situations (see for example Hemming and Trevorrow 2005; Lilley 2006; Scham 2001) as well as viewed against a background of literature regarding Indigenous nation-building and self determination (Cornell 2006; Cornell and Kalt 1998; Russell 2004) and analysed in terms of boundaries (Berndt 1976; Knight 2003;
Tindale 1940; 1974), possible site use (Smith 1980; 1982; Burke and Smith 2004) and the contribution of the GIS database and landscape analysis to Ngadjuri nation building (Godwin 2005; Kyem 2000; Poole 1995; Sheppard 2005).

Data Limitations for Analysis

Accuracy of Locational Information

The majority of the early recordings, particularly prior to the mid-to-late 1990s were not documented with a GPS, and were presumably hand plotted onto paper maps based on a location inferred by the presence of mapped landscape features. Though locational accuracy can be attained with this method, it is dependant upon many factors, such as the scale of the map being used and the navigational skills of the recorder (see Burke and Smith 2004:35-36). Therefore, the method can be less accurate than a GPS reading. In some portions of Ngadjuri Country, particularly the northeast where only 1:250,000k scale maps are available, plotting sites without the aide of a GPS is particularly challenging and unlikely to be exact even under the best of conditions. It was noted that many of the UTMs were often rounded to the nearest 100 meters. In such cases, although the conversion from either AGD datum to GDA94 loses little accuracy, the accuracy is dependant upon that of the original plotting, and is likely to vary from site to site.
GIS Layers

The vegetation/general environment layer employed in this analysis, though useful, did not cover the entirety of the region (see Figure 3.1). Although the majority of the sites (85% and 81% for vegetation and environment, respectively) were covered, a large portion of the central region lacked data. No other data layer that provided more detail than Laut et al.’s (1977) environmental provinces (as described in Chapter 1) was available. Hence, although some areas are not covered, this data layer was preferable due to the level of detail in which it described those areas that were.

Study Limitations

Outside forces and their influence on what we know

Although much can potentially be learned by looking at Ngadjuri country through the lens of landscape archaeology, this is not to say that such an approach has no limitations. Several outside forces have influenced what we know about Ngadjuri Country today. Tindale, an early anthropologist who worked with Indigenous groups throughout the majority of the 20th century and produced several maps of Indigenous Australia based on his research, has greatly influenced the way Indigenous Australia is envisioned today. Knight (2003) argues that this influence extends not only to researchers but also to the general public, other writers and Indigenous people themselves. This is manifested in the fact that the site records available for use in this project from AARD were limited by two factors, firstly Tindale’s delineation of where Ngadjuri Country is situated, and secondly restrictions on the public availability of information owing to overlapping Native Title claims.
Tindale’s ‘Tribal’ Boundaries

Although this project has mapped sites on Ngadjuri Country based upon the boundary identified by Tindale (1974), and the community is in general agreement with this location, they do not agree exactly with all of Tindale’s delineations (Vincent Branson pers. comm. 2009). Given the importance of land rights in Indigenous nation building and the legal systems need for boundary delineation in Native Title claims, an exact location of one’s land has become of utmost importance.

Particularly when considering Native Title determinations, Tindale’s mapping of tribal boundaries and classifications are an inevitable baseline (see Knight 2003:25). The influence of Tindale’s published maps is apparent in some Native Title claims using the same spellings as Tindale’s 1974 publication (Knight 2003:25). According to Knight, Indigenous people returning to Country in the post-mission era between 1900 and 1967 had no choice but to assume Tindale’s (1940) ‘Authorised Identities’ and boundary delineations since identities or boundaries unmapped by Tindale were not typically accepted by government agencies or scholars, or, more recently, by Native Title judges.
The first recording of the extent of Ngadjuri Country was made by Tindale (1937:149) and was derived from information provided by a ‘Ngadjuri informant’. According to Tindale (1937:149):

The territory of the Ngadjuri people extended from Angaston and Gawler in the south to Port Pirie and Orroroo in the north. Westward they ranged to Crystal Brook, but they scarcely touched the coast of Spencer Gulf except when on visits to the ['Nar:anga] people of the Yorke Peninsula. In the south their boundaries marched with those of the ['Kaurna] between Hamley Bridge and Gawler. Their eastern boundary was the eastern scarp of the Mount Lofty Ranges. Their northern neighbours were the ['Nukunu], who lived on the high-lands and coast near Mount Remarkable. To the north-east was ['Maraura] country. In accordance with the general practice that each neighbouring people has its own term for a tribe, we find that several names have been applied to the members of the Ngadjuri tribe by surrounding peoples.

Knight (2003) notes that the 1937 definition of Ngadjuri country differs from those later mapped by Tindale (1940, 1974). The 1937 area is approximately the same in the south as the 1940 and 1974 maps, but does not extend as far north.

Interestingly, many anthropologists disagreed with specific aspects of Tindale’s Aboriginal Tribes map (see for example Berndt 1976; Flood 1976; Mulvaney 1976; Peterson 1976), but as Knight (2003) notes, since no competing maps had yet been produced, those opposing his boundaries failed to communicate this disagreement to the wider public. It was not until 1996 that another map; ‘Aboriginal Australia’ was produced by Horton (Figure 3.7).
In addition, Knight (2003) argues that Tindale’s depiction of precise tribal boundaries does not reflect the reality of the penetrable and changing nature of Australian Aboriginal lands (see also Peterson 1976). Although Tindale’s boundaries have been contested, and this solid demarcation of a fluid and changing boundary is by nature inaccurate (Berndt 1976; Flood 1976), it is commonly accepted in the broader culture and has been agreed upon as the current project area. Nonetheless, it is important to consider the underlying issues associated with the Ngadjuri and other groups land boundaries.
Limitations of Data

Ngadjuri Country is a large area covering approximately 30,500 square kilometres of which only a limited amount (approximately 2700 square kilometres or .09%) has been archaeologically surveyed. The lack of data for much of the region makes it difficult to draw broad generalisations. As much of the land is now privately owned, archaeological survey can only be conducted with the approval of landowners, limiting the potential data collection areas. According to Ngadjuri Elders, access to land parcels has been a major factor influencing their decisions regarding locations for reconnaissance surveys (Vincent Copley and Vincent Branson pers. comm. 2009). This is not to say that important contributions cannot be made based on the information available, but only that the gaps in survey data must be considered. In fact, highlighting these gaps in data is seen as one of the strengths of the project, suggesting avenues for future research.

The data for this study is derived primarily from three sources:

- academic research projects
- development driven work conducted by archaeological consultants
- site recording trips initiated by the Ngadjuri

Each of these sources of data were collected with certain goals and limitations. The research projects conducted in the area often focus on specific site types to the exclusion of others, with a particular focus on rock art in the area (eg. Mott 1998; Nobbs 1995). The work of consultants is typically development driven, rendering the resulting data patchwork in
nature (Lower-Eskelson and Stash 2006:46), while the areas chosen by the Ngadjuri have thus far been limited to government owned lands and constrained by both land accessibility and the availability of funding (Vincent Copley and Vincent Branson pers. comm. 2009).

Detail and Consistency in Site Recording
The wide variation in the detail attained, as well as a lack of consistency in terms used by different site recorders has complicated the creation of a consistent pool of data. The site forms utilised in this project were derived from over 70 projects conducted over a period of more than 30 years and recorded by over 21 individuals. Additionally, the official State recording form went through several changes over this period and many forms were incomplete. This impeded some forms of analysis that might have been conducted with more thorough data recordings. However, this research has been able to identify sites that should be relocated, either to verify or correct locational information or to more fully describe the sites attributes, again suggesting avenues for future work.

Activities that are Detrimental to Archaeological Data
The nature of the land itself has been dramatically altered since the arrival of Europeans. “Landscapes are shaped by human action through processes such as clearance, erosion and deposition; they are also the shapers of human action encouraging and constraining various forms of land usage” (Godsen and Head 1994:114). By 1890, the vast majority of Ngadjuri country was designated freehold land, which was typically cleared of native
vegetation prior to being ploughed for crops, or has been heavily grazed by stock (SASOSE 2005; Laut 1977(3):3 and (5/6):4). Although numerous traces of Ngadjuri use of the land remain, likely countless traces have been moved, covered, overgrown by vegetation or destroyed. Furthermore, the well-documented antiquarian hobby ‘collecting’ (see Byrne 1996) has almost certainly resulted in a loss of the archaeological evidence in Ngadjuri Country today. In summary, several activities that have occurred on Ngadjuri Country may preclude the location of archaeological sites. Little can be done to mitigate this damage, however, the application of projects such this as educational tools (see Chapter 5), may serve to inform the wider public of the importance associated with material cultural objects that they may locate.

**Discussion**

This chapter has introduced the data and methods of analysis employed in this research. As a collaborative project, community involvement in aspects of the research was an important part of the methodology. The community was not only involved in the choice of project, but also the analysis conducted and data to be retained in the resulting database. Theses, reports and conversations with the Ngadjuri provided a wealth of background information. In the landscape analysis, site data was analysed in relation to a number of GIS layers seeking to uncover general trends. The following chapter describes the results of this analysis.
Chapter 4
Results

Introduction

This chapter presents the results of the landscape analysis. The range and location of documented sites on Ngadjuri Country indicate that the area has been used for numerous purposes throughout its occupation. The pool of 265 sites used in analysis is comprised of 12 site types including, open sites (see Table 4.1 for more detail on open sites); rock engravings; isolated stone artefacts; rock holes; hunting hides; quarries; rock paintings; burials; cairns; a habitation site with whirlies; a scarred tree; and a significant tree (Table 4.1).

Site Types in Ngadjuri Country

Table 4.1. Documented Site Types on Ngadjuri Country.
The range in site types indicate that the landscape supported a variety of activities including domestic tasks, subsistence practices and resource procurement, as well as the cultural practices associated with ceremony or information transfer evidenced by rock art and cairns. Although open sites are the most commonly documented site type in Ngadjuri Country, comprising 37% of the total, rock engravings also form a large portion of the sites, accounting for 28% of the total. The high proportion of engravings compared to other site types is explored later in this chapter.

**General Site Environment**

General environmental information for site locations was compared where data was available (see Table 4.2). Through a variety of environmental field surveys, data was available for a GIS layer of general environmental zones for 81% (n=215), of the analysed sites. The majority of documented sites are located in two environmental zones (plains; hill slopes/outcrops on plains). These two zones account for 38% and 33% of the sites with this information, respectively. These zones are similar in that they are both associated with plains, and when combined the resultant zone (plains and the slopes/outcrops upon them), accounts for 71% of the total sites. The zones with next the highest occurrence of sites are low plains/rises with quartz pebbles and hill footslopes. These zones account for 13% and 9% of the sites respectively. Sites have rarely been documented on rocky ridges or in drainage depressions subject to severe flooding (possibly due to erosion masking or removing artefacts).
Table 4.2. General Site Environment for all Documented Sites.

Environmental data was also compared to specific site types. As Table 4.3 shows, some site types on Ngadjuri Country are correlated with particular environmental zones. Environmental information was available for 87% (n=99) of open sites. Open sites in Ngadjuri Country have been primarily located on plains, with 57% (n=49) being situated in this zone. Open sites have also frequently been documented on hill slopes/rock outcrops on plains, with this zone accounting for 28% (n=24). When these two similar zones are combined, the resulting zone (plains of loam and/or sand and the hill slopes/rock outcrops upon them), accounts for 85% of all open sites. Additionally, no open sites in Ngadjuri Country have been documented on rocky ridges, and few have been located in drainage depressions or stream
channels. Interestingly, although open sites have most commonly been recorded on plains of loam and/or sand and the associated hills and outcrops, they have rarely been located on plains and rises that are covered in quartz pebbles. It could be that sand and loam were preferred camp locations for comfort or other reasons. Smith (1980:99) found access to flat, smooth ground surfaces to be a common element of open sites. However, as the majority of lithic materials that have been located in Ngadjuri Country are derived from quartz, lithic scatters, (a regular component of open sites), are more difficult to identify in areas of extensive quartz pebble scatter. Therefore, it is also possible that more open sites exist in these areas than have been identified.

Rock engraving sites are similarly correlated with specific environmental zones; however, this information was only available for 61% (n=44) of this site type. Of the documented engravings with this information, 57% (n=25) are located on low plain/rises with quartz outcrops (the least likely location for open sites). The next most common zone for rock engravings (hill footslopes) accounts for 20% (n=9) of the sites. Of all the major site types, rock engravings are the most likely to be situated near a stream channel or drainage depression, with 14% (n=6) of sites having been located in these zones. When compared with other sites, rock engravings are found in the closest proximity to water of all types (see Tables 4.5 and 4.6). This finding is further discussed later in this chapter.
Table 4.3. General Environment at Major Site Types.

Environmental information was available for 64% (n=9) of the documented rock painting sites. Rock paintings have been equally documented on plains, hill slopes/rock outcrops on plains, and hill footslopes. These results may highlight the possible level of error in this type of analysis, as rock paintings are unlikely to be located on plains without rock outcrops (see discussion later in this chapter).

Of the remaining major site types, information was available for 100% (n=13) of the quarry sites; 82% (n=14) of rock holes; and 75% (n=12) of hunting hides. Both quarries and rock holes are most commonly located on hill slopes/rock outcrops on plains, with the zone accounting for 64% (n=9) and
86% (n=12) of sites, respectively. Hunting hides have been documented on plains (n=6) and hill slopes/ rock outcrops upon plains (n=6) equally.

Site Location and Water Sources

In the semi-arid to arid environment that Ngadjuri Country encompasses, access to water sources would have been an important consideration in the past use of this landscape. Both major perennial and minor water sources were compared in relation to all sites collectively (Table 4.4), and major site types separately (Tables 4.5 and 4.6). The majority of documented sites in Ngadjuri Country are situated a considerable distance from a major water source, although overall sites are typically located within less than 500m of an intermittent watercourse.

This indicates that the source of water for much of the area likely came from intermittent streams that only contained water at certain times, and likely only during certain years. This could suggest that some portions of the landscape were used seasonally, when water and other resources were available; a finding supported by Smith (1980:35) in this work in northern Ngadjuri Country (see Table 4.14 for a sub-regional analysis of water source distance). Additionally, the vast distances from major water sources could be indicative of the detailed environmental knowledge and diversity of economic and settlement strategies that the former occupants of the landscape likely possessed (see Gould 1991).
### All Sites Distance From Water Source in Metres

<table>
<thead>
<tr>
<th></th>
<th>Perennial</th>
<th>Intermittent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Minimum Distance</td>
<td>746m</td>
<td>0.9m</td>
</tr>
<tr>
<td>Maximum Distance</td>
<td>23323m</td>
<td>1739m</td>
</tr>
<tr>
<td>Mean Distance</td>
<td>5700m</td>
<td>443m</td>
</tr>
<tr>
<td>Standard Deviation</td>
<td>4265m</td>
<td>398m</td>
</tr>
</tbody>
</table>

**Table 4.4. Distance to Water Source from all Sites.**

### Distance From Major Perennial Water Source by Site Type in Metres

<table>
<thead>
<tr>
<th></th>
<th>Engravings</th>
<th>Quarries</th>
<th>Rock Paintings</th>
<th>Open Sites</th>
<th>Rock Holes</th>
<th>Hunting Hides</th>
</tr>
</thead>
<tbody>
<tr>
<td>Minimum</td>
<td>14m</td>
<td>110m</td>
<td>62m</td>
<td>8m</td>
<td>3825m</td>
<td>3952m</td>
</tr>
<tr>
<td>Maximum</td>
<td>23323m</td>
<td>12271m</td>
<td>12019m</td>
<td>12353m</td>
<td>12075m</td>
<td>12928m</td>
</tr>
<tr>
<td>Mean</td>
<td>3468m</td>
<td>5219m</td>
<td>5782m</td>
<td>6741m</td>
<td>6759m</td>
<td>8369m</td>
</tr>
<tr>
<td>Standard Deviation</td>
<td>4644m</td>
<td>3301m</td>
<td>3990m</td>
<td>3693m</td>
<td>2446m</td>
<td>3941m</td>
</tr>
</tbody>
</table>

**Table 4.5. Distance from Major Perennial Water Source**
Distance From Intermittent Water Source by Site Type in Metres

<table>
<thead>
<tr>
<th></th>
<th>Engravings</th>
<th>Quarries</th>
<th>Open Sites</th>
<th>Rock Paintings</th>
<th>Rock Holes</th>
<th>Hunting Hides</th>
</tr>
</thead>
<tbody>
<tr>
<td>Minimum</td>
<td>6m</td>
<td>15m</td>
<td>1m</td>
<td>30m</td>
<td>65m</td>
<td>139m</td>
</tr>
<tr>
<td>Maximum</td>
<td>1693m</td>
<td>821m</td>
<td>1524m</td>
<td>1640m</td>
<td>1194m</td>
<td>1040m</td>
</tr>
<tr>
<td>Mean</td>
<td>373m</td>
<td>383m</td>
<td>440m</td>
<td>536m</td>
<td>541m</td>
<td>596m</td>
</tr>
<tr>
<td>Standard Deviation</td>
<td>343m</td>
<td>279m</td>
<td>404m</td>
<td>519m</td>
<td>397m</td>
<td>366m</td>
</tr>
</tbody>
</table>

Table 4.6. Distance from Intermittent Water Source.

As shown in Table 4.5 and 4.6, when compared to both major perennial and intermittent water sources, engravings are the site type most commonly located nearer watercourses, while hunting hides and rock holes are commonly situated at the greatest distance. The rock holes themselves were not considered a water source in this analysis. When compared to both types of water sources, quarries are second most likely to be nearer water. Rock paintings are more likely that open sites to be located closer to a major water source, though open sites are more commonly nearer an intermittent water source than rock paintings.

Rock Art and Water

The occurrence of rock art sites within close proximity to water sources is noteworthy given the author’s field discussions with Ngadjuri Elders. In September 2009, a rock engraving site was re-recorded as part of the Ngadjuri Heritage Project in northern Ngadjuri Country. The site was situated
on a low rise covered in quartz pebbles upon a broader plain, with a 360 degree view of the surrounding area. Ngadjuri Elder Vincent Branson pointed out water sources in the surrounding area (evidenced by stream drainage channels and isolated tree groves), and suggested that the engraving may have been created to indicate the location of these features in the broader landscape (Vincent Branson pers. comm. 2009).

Other researchers have found rock art sites to be in close proximity to water sources (see for example Gunn 2004:65; Morwood 1984; Ross and Abbott 2004:71). Ross and Abbott (2004) found an association between engravings and ephemeral water (rather than more reliable sources) and suggested that this, along with similar patterning in other site types, could be indicative of their association with recent social changes and an increase in ceremonial activity.

**Hunting Hides and Water Holes**

Hunting hides and rock holes are commonly situated furthest from both perennial and intermittent water sources, being located an average of 596m and 541m from intermittent water and 8369m 6759m from major perennial water, respectively. The occurrence of rock holes at a greater distance from water sources could be expected, as the purpose of this site type is water collection. The presence of hunting hides at a distance from water sources suggest that the animals hunted from the hides were not approached at water sources but in other locations. As Table 4.8 indicates, hunting hides are also typically located on a greater slope than most other site types, with a
mean slope of 5.2 degrees. Hence, the distance from water may be explained by the fact that hunting hides are typically on hill slopes, while water sources are situated on the lower plains in this region. This finding is supported by Smith (1982:26) who argued that the hunting hides in the Plumbago area were often found on route to water holes in habitat of the euro (*Macropus robustus*), and rock wallaby (*Petrogale xanthopus*).

**Site Slope**

The degree of slope upon which a site is located can be particularly useful in its predictive modelling capabilities (Bevan and Conolly 2004; Vaughn and Crawford 2009), as well as its ability to inform the choice of future survey locations. Hence, the slope value for all sites collectively, as well as major site types individually, were calculated. As shown in Tables 4.7 and 4.8, site locations in Ngadjuri Country are typically located on land with a very low degree of slope, with the average being only 2.4 degrees.

<table>
<thead>
<tr>
<th>Slope of All Sites</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Minimum Slope</td>
<td>0.1 degrees</td>
</tr>
<tr>
<td>Maximum Slope</td>
<td>16.6 degrees</td>
</tr>
<tr>
<td>Mean Slope</td>
<td>2.4 degrees</td>
</tr>
<tr>
<td>Standard Deviation</td>
<td>2.4 degrees</td>
</tr>
</tbody>
</table>

*Table 4.7. Degree of Slope for All Sites.*
### Degree of Slope for Major Site Types

<table>
<thead>
<tr>
<th></th>
<th>Open Sites</th>
<th>Quarries</th>
<th>Engravings</th>
<th>Rock Holes</th>
<th>Hunting Hides</th>
<th>Rock Paintings</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Minimum Slope</strong></td>
<td>0.1</td>
<td>0.4</td>
<td>0.3</td>
<td>0.4</td>
<td>2.9</td>
<td>0.6</td>
</tr>
<tr>
<td><strong>Maximum Slope</strong></td>
<td>12.6</td>
<td>4.2</td>
<td>9.8</td>
<td>6.9</td>
<td>8.6</td>
<td>16.6</td>
</tr>
<tr>
<td><strong>Mean Slope</strong></td>
<td>1.8</td>
<td>1.8</td>
<td>2.8</td>
<td>3.1</td>
<td>5.2</td>
<td>6.0</td>
</tr>
<tr>
<td><strong>Standard Deviation</strong></td>
<td>2.1</td>
<td>1.1</td>
<td>2.3</td>
<td>1.5</td>
<td>1.7</td>
<td>4.9</td>
</tr>
</tbody>
</table>

**Table 4.8. Degree of Slope for Major Site Types.**

Of all documented types in Ngadjuri Country, open sites have been most commonly located on relatively flat ground, with an average slope of less than 2 degrees. This finding corresponds with the general environmental description for this site type, being most commonly located on plains. Likewise, quarries have also been commonly documented on slopes of less than 2 degrees. Interestingly, engraving sites have also been located primarily on relatively flat ground with an average slope of 2.8 degrees; a slope which is less than half that of documented rock art sites. This again corresponds with the general environmental description for engraving sites, which have most commonly been recorded on low plains and rises. The higher slope of rock paintings is indicative of their location on hill slopes and in rock outcrops. The higher slope values for rock holes and hunting hides also correspond to their prevalence in these environmental zones.
Vegetation and Site Location

Although digital vegetation information is not available for the entirety of Ngadjuri Country (see Chapter 3 for vegetation layer), numerous vegetation surveys have been conducted in the area, providing general descriptions at the location of 85% ($n=225$) of the sites. The majority of sites for which information is available are located in chenopod shrublands ($n=139$ or 62%) and acacia woodlands ($n=75$ or 33%), with only 10 sites (5%) located in other vegetation types. Both chenopod and acacia have been documented as a common food source of Indigenous Australians (Latz 1995; McConnell 1998; SASOSE 2005; Smith 1980:47).

### Dominant Vegetation Types at Site Locations

<table>
<thead>
<tr>
<th>Dominant Vegetation Types at Site Locations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chenopod Shrubland</td>
</tr>
<tr>
<td>Acacia Woodland</td>
</tr>
<tr>
<td>Eucalypt/Mallee Woodland</td>
</tr>
<tr>
<td>Tussock Grassland</td>
</tr>
<tr>
<td>Calitris Forest</td>
</tr>
</tbody>
</table>

Table 4.9. Dominant Vegetation Types at Site Locations.
As Table 4.10 shows, the dominant vegetation type varies somewhat by site type. Rock engravings have been documented almost exclusively in chenopod shrublands, while open sites, although most commonly documented in chenopod shrublands, have also been regularly located in acacia woodlands. Water holes and rock paintings have been most often recorded in acacia woodlands, while hunting hides have been recorded equally in chenopod shrublands and acacia woodlands.

### Vegetation at Major Site Types

![Vegetation at Major Site Types](image)

**Table 4.10. Dominant Vegetation at Major Site Types.**

**Site Distribution**

The distribution of site types across Ngadjuri Country at the time of writing is largely likely to be a product of what areas have been surveyed, rather than an actual presence or absence of sites. Figure 4.1 shows the distribution of all documented site types in the region. The majority of documented sites...
occur in the northeastern portion of the Country, the only area where a relatively large systematic survey has been conducted.

Figure 4.2 shows the approximate location of conducted survey of Ngadjuri Country. The highlighted areas show work conducted for consultancy projects, however, for the broader shaded areas, little specific information is available. With the exclusion of Smith’s work in the north, it is assumed this is because, although some sites have been recorded in other areas, systematic surveys were not conducted. The survey map therefore is considered only as a general guide, with the blue highlighted areas representing consultancy surveys where a presumably thorough survey was conducted, while the grey shading represents areas where some survey may have been conducted, though it was likely focused on specific site types, and thus should not be considered complete.
Figure 4.1. Site Distribution on Ngadjuri Country.
Figure 4.2. Site Distribution on Ngadjuri Country with Surveyed Areas; Consultancy Surveys Highlighted. (Survey data layer provided by AARD).
In order to shed light on the nature of the survey conducted in other areas, a map was created highlighting consultancy based surveys and rock engraving sites (Figure 4.3). These attributes were chosen due to the seemingly high interest in rock engravings in the region, based on the number of reports specific to this topic (see Mott 1998 for a complete list). As this map illustrates, with the exclusion of the northern areas surveyed by Smith (1980) and/or Flinders University, only six non-engraving sites have been located within the areas not covered in the smaller consultancy-based projects. Interestingly though, the majority of the engraving sites are situated in the broader region lacking specific survey data. Based on this finding, it is assumed that most engravings were sought out and recorded without consideration for other site types in the area. As a result, it is likely that numerous other sites could be located in these areas upon systematic survey.
Figure 4.3. Map showing Engraving Sites and Surveyed Areas with Consultancy Surveys Highlighted. (Survey data layer provided by AARD).
Figures 4.4 through 4.14 show the distribution of major site types in Ngadjuri Country. Of particular note are the engraving sites (Figure 4.5), which occur exclusively in the northern 2/3rds of the region, with 60% of documented engravings occurring in roughly the northern 1/3 of the region.

Rock paintings are similarly concentrated in the north (Figure 4.6), with all but 1 (n=9), situated in the far north. Open sites are more evenly distributed throughout the region (Figure 4.4), though a concentration has been documented in the far north, largely due to Smith’s (1980) fieldwork. Additionally, Table 4.11 shows the breakdown of open sites by type.

Table 4.11. Number of Open Sites by Type.
Hunting hides have been recorded almost exclusively in the far north of Ngadjuri Country (Figure 4.8), and curiously, all but one were recorded as part of Smith’s (1980) work. This could indicate either that hunting hides were more frequently used in this area, that they have been moved or destroyed further south due to pastoralism or other development, or possibly that other site recorders were unfamiliar with this site type. Without further survey, the nature of the concentration of hunting hides in the far north is difficult to determine.

Of the 13 documented quarries, all but two are located in the far northern portion of the Country (Figure 4.7). The two outliers are situated in the Redbanks area, in the southern portion of the region. All of the documented quarries are quartz extraction areas, with the exception of one chert quarry located in the far north. Isolated lithic artefacts are similarly heavily concentrated in the north. This is likely a product of recording practices, a concept further explored later in this chapter.
Figure 4.4. Documented Open Site Distribution in Ngadjuri Country.
Figure 4.5. Documented Engraving Site Distribution in Ngadjuri Country.
Figure 4.6. Documented Rock Painting Site Distribution in Ngadjuri Country.
Figure 4.7. Documented Quarry Distribution in Ngadjuri Country.
Figure 4.8. Documented Hunting Hide Distribution in Ngadjuri Country.
Figure 4.9. Documented Rock Hole Distribution in Ngadjuri Country
Figure 4.10. Documented Cairn Distribution in Ngadjuri Country.
Figure 4.11. Documented Burial Distribution in Ngadjuri Country.
Figure 4.12. Documented Significant/Scarred Tree Distribution in Ngadjuri Country.
Figure 4.13. Documented Whirlie Distribution in Ngadjuri Country.
Figure 4.14. Documented Isolated Lithic Distribution in Ngadjuri Country.
Goyder’s Line

In 1865 by Surveyor-General Goyder of South Australia was created to mark the limit to which drought extended south that year, which soon became known as Goyder’s line (Andrews 1966). An analysis of site distance to water relative this line was conducted. At this time vegetation and general environmental data is unavailable for the majority of the sites south of the line, hence this analysis was not carried out.

<table>
<thead>
<tr>
<th>Site Distance to Water Relative to Goyder’s Line</th>
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<tbody>
<tr>
<td></td>
</tr>
<tr>
<td>North</td>
</tr>
<tr>
<td>Minimum Distance</td>
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<tr>
<td>Maximum Distance</td>
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<td>Mean Distance</td>
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<td>Standard Deviation</td>
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<td>South</td>
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<tr>
<td>Minimum Distance</td>
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<tr>
<td>Maximum Distance</td>
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<tr>
<td>Mean Distance</td>
</tr>
<tr>
<td>Standard Deviation</td>
</tr>
</tbody>
</table>

**Table 4.12. Site Distance to Water Relative to Goyder’s Line.**

As the above table shows, the mean distance to water is nearly double north of the line than that of the south, with the southern sites on average 3417m nearer a water source than the northern sites. Several researchers have noted the impact of access to resources upon foraging populations (see for example Hiscock 2008:201; Lourandos 1997:12). It is possible that the decreased distance in the south represents a lack of need to travel further from water sources to procure resources in the relatively wetter south,
implying an increased level of sedentism, while in the drier north the procurement of resources would likely have required travel further afield.

Figure 4.15. Ngadjuri Country Showing Sites and Goyder’s Line⁵.

⁵ This is an approximation of Goyder’s line which was digitised by the author based on the location of townships.
Intra-Site Analysis

In this analysis, rock art sites, both engravings and paintings, were compared with other site types to determine if art sites have commonly been documented near others. Rock art was selected for comparison due to the focus on this site type by many previous researchers (Mott 1998, Nobbs 1978, 1983; 1995 [see Mott 1995 for a full review of early work]). In the case of documented engravings, the site type was found to exist primarily in isolation. Of the 72 documented engraving sites, only three are situated within a 1km vicinity of other sites. Additionally only 11 engraving sites exist within a 5km radius of other site types, leaving the remaining 80% (n=58) of engravings over 5km from any other site type. The distance could indicate the probable increased visibility of engravings in relation to other types, such as open sites, which could have been masked by erosion or farming practices. However, when viewed in light of other evidence, the distance is probably a reflection of selective recording practices, rather than the actual location of sites. In the case of those engravings with surrounding sites, one exhibits ten other sites within a 1km vicinity (two rock holes, two quarries, and six open sites), all of which were documented by Smith (1980). Furthermore, all three engravings with other sites in the 1km vicinity were recorded either by Smith (1980) or Flinders University students. Both of whom document all site types encountered, rather than focusing on a specific site type.
Table 4.13. Distance from Engravings to Other Site Types.

When comparing the vicinity of rock paintings with other site types, three of the ten sites are located within a 1km radius of other sites. One site exhibits five other sites within a 1km area, while the other two are within 1km of eight sites each. The sites in the vicinity of the rock paintings include ten open sites, six hunting hides, four rock holes and one isolated artefact. Of the remaining rock painting sites seven have other sites within a 5km radius, and all ten are within 10km of other sites. Interestingly, all but one of the rock painting sites are situated within Smith’s (1980) survey area or areas surveyed by Flinders University.

As with engraving sites, rock paintings may be more readily visible in some areas than other site types. However, the art sites (both engravings and paintings) located in areas surveyed by Smith (1980) and Flinders University
are more commonly situated near other site types, with 100% of the art sites exhibiting other sites in a 1km vicinity having been documented by these recorders. Consequently, this analysis again points to selective recording practices rather than actual site presence.

**Distance from Rock Paintings to Other Site Types in Kilometres**

![Graph showing distance from rock paintings to other site types in kilometres. The graph displays minimum, maximum, mean, and standard deviation distances.]

Table 4.14. Distance from Rock Paintings to Other Site Types.

**Targeted Survey and Predictive Modelling**

Although accurate predictive modelling is difficult at this time given the limited amount of data available for the large project area, some generalisations about the likelihood of locating sites in certain areas can be made. This information could be used to inform decisions regarding future surveys, and when more data becomes available, to create predicative site location models. This analysis has shown that sites in Ngadjuri Country have been most commonly located on plains, or the hill slopes/rock outcrops upon them,
within less than 500 meters of an intermittent water source. Furthermore, most sites have been located on a slope of 6 degrees or less. Additionally, sites in the region have regularly been recorded in chenopod shrublands or acacia woodlands. As shown in Tables 4.8 and 4.9, this general information varies based on individual site type, and consequently could be tailored to fit specific aims.

The Effects of Collector Bias

The influence of individual choice upon the collection of data has been studied in a variety of contexts (Jones 2008; May 2000:95-144; Satterthwait 2008). This analysis examines the effects of recording practices upon the broader pool of data available for this project. While this is primarily conducted by comparing site information collected by Smith (1980) with that collected by all others who have documented sites in Ngadjuri Country, it should be recognised that as previously mentioned, some archaeologists focused on rock art by choice.

Smith’s (1980) Survey

Smith’s survey of portions of the Plumbago Reserve, in the northern portion of the Ngadjuri Country, accounts for 150 or 57% of the sites for this project. Smith’s (1980) work resulted in the documentation of 242 sites, however, many of these occur outside of Tindale’s boundary for Ngadjuri Country, hence only the 150 sites located within Ngadjuri Country are included. These sites were documented during a survey of only 7.3%, or approximately 64 square km, of the 881km station (Smith 1980:68).
Smith’s survey methods defined an archaeological site as “any evidence of human activity” (Smith 1980:75). The work resulted in the documentation of a variety of sites types (see Table 4.17) including, open sites (hearts n=42, hearths with flakes and/or other lithic tools n=24, lithic scatters n=7, no further info n=2); hunting hides; rock holes; quarries; rock paintings; rock engravings; cairns; a habitation site with whirlies; and isolated artefacts. Smith’s work is the only large systematic survey that has been conducted on Ngadjuri Country. As the project accounts for approximately half of the documented sites and the definition of a ‘site’ for the project is known, these sites contrasted against those recorded by others provides and interesting lens through which to view collector bias.

Table 4.15. Sites on Ngadjuri Country Documented by Smith (1980).
Table 4.18 shows the breakdown of site types in Smith’s (1980) work compared to other site recorders. Curiously, the percentage of rock art is greatly increased in sites documented by ‘others’. This could be interpreted as a greater occurrence of rock art, particularly engravings outside of Smith’s survey area. However, the discrepancy is probably indicative of selective recording practices, rather than a reflection of genuine site distribution.

Table 4.18. Comparison of Smith’s (1980) Sites types with Other Recorders.

As Table 4.18 illustrates, there are four main areas of difference (open sites, rock engravings, isolated artefacts and hunting hides) in site type occurrence. The discrepancy in the quantity of rock engravings as opposed to open sites is likely a direct result of recording practices. Although Smith (1980) conducted a comprehensive survey documenting all sites types, many other projects focused on rock art (usually rock engravings), rather than choosing
to record all site types in their project areas. This has resulted in artificially high numbers of engraving sites in contrast to other sites. Hence, the quantity of rock engravings compared to other sites in Smith’s work is considered a more accurate representation of site type proportions.

In the case of isolated artefacts, given Smith’s (1980) site definition, a large number of isolated lithics were documented. This is unlikely to be the practice of all archaeological surveyors, many of whom may not record isolates, or if they do, are unlikely to consider them a ‘site’. Only two isolated artefacts have been recorded by others, both by Flinders University students. Hence, as with rock art, the lack of documented isolated artefacts in other areas is again almost certainly a product of recording practices, rather than the actual occurrence of isolates.

The predominance of hunting hides in the Smith’s sites is interesting. The high quantity of the site type suggests that the area was likely a fertile hunting ground in the past. Curiously, only one hunting hide has been documented by other recorders. Perhaps the northern region where Smith worked was more commonly used as a hunting ground for animals hunted from a hide. Anderson (2000:20) describes Plumbago Station as home to South Australia’s largest yellow-footed rock wallaby (*Petrogale xanthopus*) population, and Smith (1980:47) notes that the euro (*Macropus robustus*) may have been an important food source in the area. The preferred habitat

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6 As a number of sites lacked specific information regarding the quantity of artefacts, the distinction between lithic scatter and isolate was determined by the way a site was defined by the recorder and while the number of artefacts comprising an isolate is limited to one to two flakes, the number of artefacts in many of the lithic scatters is not known.
of both species is rocky outcrops (Clancy et al. 1991; Pope et al. 2009); the most common location for hunting hides in Ngadjuri Country. However, it is also possible that hunting hides in other areas have been disturbed by pastoralism or other activities, or that other recorders are unfamiliar with this site type. Additional work will be required to determine the nature of this finding.

Discussion
As this chapter has outlined, the range of site types on Ngadjuri Country indicate that the landscape was home to a variety of activities in the past, and that certain activities are generally correlated with particular environmental zones. The analysis has also identified the influence of access to water and ground slope on documented site locations. Additionally it was found that the average distance from a water source to site, as well as the dominant site vegetation changes throughout sub-divisions of Ngadjuri Country. This information can be used to inform future surveys and upon additional data collection, create a predictive model of the area.

The average distance from water sources to sites was also found to change relative to Goyder’s line with the average distance from sites to a water source south of the line being nearly half that of the north. This could be reflective of a greater degree of sedentism in the southern portions of the region where resources were more plentiful (see for example Hard and Merrill 1992; Kelly 1992; Veth 2005).
The analysis has shown that site recorders in the region have been biased toward a preference for rock art sites, with engravings receiving particular attention. Because of this, the proportion of site types in the overall region reflects an artificially high number of engraving sites. Smith’s (1980) survey in the north of Ngadjuri Country is considered more reflective of actual site proportions. Furthermore, numerous additional sites are likely to be located in areas that have been surveyed for rock art, but not other site types.

Limitations

The general environmental and vegetation analysis was limited by the incomplete nature of the data, providing the information for 81% and 85% of the sites, respectively. However, although this layer was incomplete, it did provide useful information for the majority of the sites. The vegetation data provided here refers to the current vegetation at these locations, and must be considered in light of the fact that vegetation has likely been altered in most areas since the time of the European colonisation. Prior to European arrival the vegetation of Australia had evolved without incurring close grazing animal herds (Osborn 1925:292-293). The introduction of grazing animals, as well as other non-native species such as rabbits has greatly impacted native vegetation in much of Australia, including the study area (Osborn 1925). A number of sites in Ngadjuri Country occur in acacia woodlands. The increase in woody weeds, of which acacia is a part have been on grazed land has been noted by several authors (Grice and Westoby 1987; Harrington 1991; Harrington et al. 1984; Sinclair 2005). The exact reason for the increase is still a matter of speculation, however, the link is clear, hence,
the prevalence of acacia in some regions is likely to have increased since the arrival of Europeans. However, extent to which this has occurred in the project area is not known.

Another limitation in the data employed was highlighted by the presence of three rock paintings on plains in the general environment analysis (Table 4.3). This result could be rooted in a slight error in the site locational information provided on the site forms, or it could represent an error in the environmental information layer used in the GIS analysis. Given that the vegetation layer was derived from the compilation of numerous projects with data collected by several individuals, an inconsistency in the application of terms is possible. For example, one recorder may see a plain where another sees hill slopes and rock outcrops on a plain. Either way, this discrepancy highlights the need to critically assess the results of GIS analysis. Nonetheless, if the three sites assumed to have incorrect information are excluded, the remaining six sites (66% of the site type with information) are located on hill footslopes or hill slopes/rock outcrops on plains. From the author’s field experience in Ngadjuri Country, these results are representative of rock paintings sites that have been personally visited.

Rock art sites, particularly engravings, were found in the closest proximity to water of all site types. However, in the case of all site distances to water there are several factors to consider. Firstly, as the antiquity of the sites, particularly the engravings, is not known (see Chapter 5 for further discussion), an accurate picture of water sources during the time of their
creation is also not known. During and since the last glacial maximum (25,000 to 12,000 BP), major changes in the climate throughout Australia have occurred, significantly affecting Indigenous use of the landscape (Hiscock and Wallis 2005; Smith 1993b; Veth 1989). Due to these climactic changes, and more recent activities such as pastoralism, the distribution of water sources in the landscape is likely different than it was in the past. The lack of diachronic framework for sites further complicates the estimation of water access. Therefore, though distance to water is a useful analysis, diachronic environmental change should be considered when such generalisations are made.

The following chapter explores the implications of this project in terms of Ngadjuri nation building.
Chapter 5
Discussion

Introduction

This chapter explores the process of returning to Country and associated issues as they relate to this research. The results of this project are also explored within the context of Ngadjuri nation building as well as its implications for Indigenous nation building internationally.

Figure 5.1. Indigenous Nation Building and Related Issues.
Coming Back to Country and Building an Indigenous Nation

The main factors involved in Indigenous nation building are the transmission of cultural knowledge, the control over cultural heritage, the recognition of identity and self determination. These are related to several inter-related issues, as depicted in Figure 5.1. The transmission of cultural knowledge is of concern to educate both the public and the younger generation in the group. Control of cultural heritage is related to issues such as repatriation, land rights and intellectual property. Self determination can lead to economic empowerment and therefore, the alleviation of poverty. The recognition of identity, both within the group and by outsiders, is of concern, while the recognition of identity by outsiders and their education regarding a group is related to the use of language in reference to the group in question.

Transmission of Cultural Knowledge

The transmission of cultural knowledge has been identified as a concern by the Ngadjuri and many other Indigenous groups (Isaacson and Ford 2005; Vincent Copley and Vincent Branson 2009). According to UNESCO (2009b) “there is an urgent need to enhance the intergenerational transmission of Indigenous knowledge”. The Ngadjuri are concerned both with passing on cultural information to the younger generation in their community and the education of the broader public, particularly school children of the region.
To Younger Generation

A major focus of the Ngadjuri return to Country is to foster an interest in culture in younger generations, and pass on cultural knowledge to them (Vincent Branson and Vincent Copley pers. comm. 2009). According to Vincent Branson (pers. comm. 2009), it is of particular concern for the younger generation to know “where they came from”. A map of Ngadjuri Country illustrating documented archaeological sites provides a teaching tool that community Elders can use to illustrate stories and transmit information to the younger generations (Vincent Branson and Vincent Copley pers. comm. 2009). Moreover, a landscape analysis provides an additional layer of information concerning the way the Ngadjuri used this land, which can demonstrate another aspect of their shared history to younger generations. The information in the database will also allow the community to access locational and site type information and will facilitate the planning of site visits for community members and well as informing future survey locations.

Due to the early colonisation of the region, the Ngadjuri were displaced long before anthropologists and archaeologists arrived, collecting information. According to Ngadjuri man Vincent Copley Jr. (pers. comm. 2009):

In other areas, a lot of information was recorded, but that didn’t happen here, so we have to find the information for ourselves. It’s re-learning how our ancestors lived. Different groups lived different ways in different areas. It’s good to establish a connection with how our ancestors lived pre-colonisation. It’s good to have that knowledge to pass on to our children, and our children’s children.
Education of the Public

The National History Curriculum for Australian schools was recently reviewed and input was sought from outside professionals regarding its future design (National Curriculum Board 2008). A proposal outlining the advantages of incorporating archaeology into the curriculum was submitted by Smith et al. (2008). Archaeology is the ideal vehicle for aspects of history, and for contributing to the development of literacy, numeracy, critical thinking and analytical skills (Smith et al. 2008). Additionally, archaeology can be adapted to provide a ‘life-enhancing experience’ at all ages and levels (Smith et al. 2008:4). The success of teaching archaeology in schools is evidenced by numerous case studies (Nichols and Ulm 2008).

The Role of Landscape Archaeology

The Ngadjuri do not see their Country as a series of archaeological sites, but as an integrated area where trees, creeks, native vegetation and the remains of material culture are equally important (Vincent Copley and Vincent Branson pers. comm. 2009). Therefore, not only the physical map of Country, but also archaeological site locations the landscape analysis provide useful data, and incorporating an analysis of the location of archaeological sites with landscape features to paint a more holistic picture of the way their Country was used in the past is a culturally appropriate methodology. Landscape archaeology provides a unique perspective to consider facets of an area such as environmental information, in conjunction with the information gained by the recording of archaeological sites, providing insights regarding past land use, in order to infer broader socio-cultural
patterns (see Bradley et al. 1994; Pickering 1994; Ridges 2003; Taçon 1998 among many others). Hence, the study of archaeological landscapes can provide information that may have been lost in cases of severe displacement.

The Ngadjuri Elders have explained that there is a younger generation of the descendants of Europeans now living on their Country who are largely unaware that any Indigenous group resided there prior to colonisation (Vincent Branson and Vincent Copley pers. comm. 2009). Because of this, the community has been actively involved in educating children in the area about their Country and the area’s history (Vincent Branson and Vincent Copley pers. comm. 2009). This is conducted through visits to local schools and sometimes site visits, with teachers and other school members. The information derived from this project could be integrated into existing school programs and the GIS database with locational information could be employed to inform field trip locations with local students.

**Control of Cultural Heritage**

The re-gaining or maintaining control over their cultural heritage is a concern for many Indigenous groups (Isaacson and Ford 2005:355-357; Parker 2005). Major themes related to this issue include land rights, repatriation and intellectual property (Nicholas and Bannister 2004; Parker 2005; Smith and Jackson 2006:320-21).
Maps, Cultural Knowledge and Power

Harley (1988:278-279) described maps as “value-laden images”, by virtue of a map’s attributes, its image is symbolic: “cartography can be a form of knowledge and a form of power”. In this sense, the production of a map of ‘Ngadjuri Country’ labelled as such, marking places of Ngadjuri heritage, symbolises a measure of Ngadjuri power that the typical map of the mid-north of South Australia does not. Viewed in this light, the typical South Australian map with its European settlement locations and place names could be seen to represent the inverse, perhaps reinforcing dispossession and the social and cultural associations of it.

Power, through the control of knowledge, has been retained and shaped by governments thorough both policies and legislation regarding aspects of Indigenous heritage, as well as by archaeologists and anthropologists through the analysis and dissemination of knowledge regarding Indigenous heritage (Parker 2005; Pels 1997; Smith 1999b, 2004a; Trigger 1984). The unequal balance of power between archaeologists and the Indigenous populations working with them has been well documented (see for example Nicholas and Hollowell 2008; Swidler et al. 1997). Smith (2000:109) argues that archaeological knowledge, and the symbolic associations of ‘heritage’ are used by government agencies to understand and govern various groups within the society.

Harley discussed Giddens’ theory of “social systems embedded in time and space”, referring to “authoritative resources retained by the state” and noting
that “storage of authoritative resources involves above all the retention and control of information and knowledge” (Harley 1988:279, italics in original). This concept, applied to the current situation, highlights the State as retaining an element of Ngadjuri cultural knowledge in its housing of reports, site forms and locational information regarding Ngadjuri archaeological sites. In this sense, both the maps produced and the information derived from this project will return an element of knowledge, and therefore power, to the Ngadjuri community.

Heritage Management

Information regarding the location of existing sites and surveyed areas is vital to heritage management. In the face of development, knowing where documented sites are enables potential damage to be avoided or mitigated. Knowing the location of previously surveyed areas can help to avoid the sometimes costly procedure of re-surveying, and perhaps provide additional time (which is often in short supply in consultancy projects) to be focused on a more detailed survey of unexamined areas.

The Ngadjuri community is involved in the survey of land prior to development on their Country, alongside archaeological consultants. The GIS database will provide vital information in the regard, showing the location of documented archaeological sites, and previously surveyed areas. This will enable the community to visually compare potential development areas with documented site locations, and make informed decisions regarding future action. Though this information is typically sought by consultants before their
work, the community were reliant upon outside parties to provide most of this
data to them, and the portions they retained were not organised in a way that
was easily accessible. Hence, through accessing information available in the
database, other management issues are made easier and can be conducted
without the endorsement of outside agencies.

Native Title
In order to prove Native Title, the claimant group must illustrate how their
traditional laws and customs are associated with the land or waters in
question (Sutton 2003b). A claimant must establish that these traditional
laws and customs are much the same as those of their ancestors who were
associated with the land prior to the imposition of British sovereignty, that
these laws and customs are typical for the group and that the generational
transmission of these laws and customs is generally intact (Sutton 2003b).
Proof of these associations can be difficult to illustrate and although
anthropologists have historically had a greater involvement in Native Title
cases than archaeologists, at times archaeology can provide useful
information (Veth 2000). In fact, archaeologists sometimes make ‘significant
contributions’ to Native Title determinations (Godwin 2005:81).

While the Ngadjuri community has not formally lodged a Native Title claim,
the regional consolidation of data conducted as part of this research provides
a useful first step in its identification of documented sites. McCarron-Benson
(2005:70) identified three main ways that archaeology has been influential in
Native Title claims, these include, providing information regarding the scope
and depth of occupation of an area, identifying land-use patterns, and providing evidence of continued occupation of sites that overlap between sovereignty and contact. Although the difficulties in legally associating the archaeological record with the group and time period required for successful Native Title claim are acknowledged, a preliminary collection of available data is seen as a logical course of action.

**Self Determination**

Although years of government policies have been targeted at the integration and assimilation of Indigenous groups into the broader societies within which they are situated, researchers have found that self determination can have lasting positive effects in Indigenous nation building (Cornell 2006; Cornell and Kalt 1998). An element of self determination can be reached through collaborative research which addresses needs and concerns of a community.

**Collaboration and Empowerment**

In addition, the act of collaborating in research projects can have positive effects in empowering communities regarding their heritage (see Greer et al. 2002; Moser et al. 2002; Ross and Abbott 2004; Smith 1999c) and thus facilitating the return to Country. For example, in a meeting conducted as part of this research in March 2009, Ngadjuri Elders presented a draft of research protocols that the community had created for individuals interested in conducting research with them. The document outlined issues such as the necessity for community collaboration in all projects, the cultivation of long-
term relationships with the community, and intellectual property rights. A current draft of the Ngadjuri research engagement lists two principles:

- **Principle 1:** Research is a partnership. The Ngadjuri Walpa Juri Lands and Heritage Association (NWJLHA) believe they have important histories and stories, and some of this should be shared with the world. The NWJLHA also understand there are professions and professionals to whom the Ngadjuri represent a valuable source of information. The NWJLHA prefer a method of engagement with researchers on equal terms, with benefits to both groups.

- **Principle 2:** The NWJLHA believe that they are always the custodians of Ngadjuri knowledge’s passed on to non-Ngadjuri people. The Ngadjuri believe that in sharing knowledge they are not giving up ownership or rights to that knowledge.

These assertions of pro-active decision-making regarding the parameters of research projects are an act of self determination and empowerment (see for example Rappaport 1995; Rigney 1999; Smith 1999c). As Cornell (2006:17) notes, a community’s self determination as a factor that promotes appropriate solutions to problems, allows for an efficient use of resources and fosters engagement in community development. Though possibly small instances, these are seen as evidence of empowerment and steps forward in the process of returning to Country and nation building.
Recognition of Identity

The recognition of identity by others in the broader society is an issue in Indigenous nation building. Archaeology is in a unique position regarding groups returning to Country after displacement where few archival sources are available as it values material culture, which is related to identity formation.

Authenticity Debate

Indigenous Australians were generally seen as a group whose authenticity began to fade with the onset of European colonisation and their interaction with the new arrivals (Byrne 1996; Davis 2007:42). The idea of an Australian Aboriginal culture frozen in time permeated the early literature, which referred to pre-contact Indigenous Australians as the only authentic specimen of this culture (Byrne 1996). Europeans avidly collected Aboriginal artefacts as a remnant of a dying culture (Byrne 1996; Davis 2007).

Indigenous Australians typically view themselves as closely tied to the land (Ross 1996). The archaeological sites on a group’s traditional land are an integral part of their cultural heritage and cultural heritage is inseparable from the assertion of cultural identity (Ross 1996:12). The issue of authenticity in the assertion of identity is particularly important for a group that have been dispossessed of their homeland, such as the Ngadjuri. In addition to the community’s loss of land is the fact that due to their forced removal from Country and association with other Indigenous groups, the wider society may question their authenticity. Since the advent of Native Title the assertion of identity and association with place is essential in terms of future land rights.
(Ellemore 2009:236), as not doing so would leave the Ngadjuri vulnerable to claims of their land by other groups. At the time of writing four neighbouring groups had lodged land claims that encompass portions of Ngadjuri Country (Commonwealth of Australia 2009).

Assertion of Identity of Broader Society

The issue of authenticity in one’s cultural identity is one that has plagued Indigenous Australians since the arrival of Europeans. This is in no way due to a lack of authenticity in Australia’s Indigenous population, but to the perception of an authenticity rooted in the past commonly held by early settlers (Byrne 1996; Davis 2007). The assertion of a cultural identity for many Indigenous Australians is subject to outsider scrutiny regarding its authenticity even today (Davis 2007:313). Ngadjuri Elders have noted that in the past most non-Indigenous people thought that the only true Aboriginal person was what was referred to as “full blood”, who would typically be found in a remote area (Vincent Copley and Vincent Branson pers. comm. 2009; see also Mattingley and Hampton 1992:160; Davis 2007:62). This view also exists in some remote Indigenous communities, where terms such as ‘yella fella’ are used to describe those of mixed ancestry (Vincent Copley and Vincent Branson pers. comm. 2009).

Identity is created in relation to, and embedded in the broader society (Jackson and Maddox 1993; Thomas 2001; Weigert et al. 1986). There are factors, however, that can assist in the creation of a Ngadjuri identity that is accepted by the broader society. Ngadjuri Elders explained how their
involvement in the Ngadjuri Heritage Project, a partnership between the community and Flinders University, has helped in this regard, both through a Ngadjuri association with the University and through the information which is derived from the project, providing additional evidence supporting a Ngadjuri identity (Vincent Branson and Vincent Copley pers. comm. 2009). The Elders noted that they are also learning through this partnership and any additional information they can gain provides an additional impetus toward the assertion of their identity (Vincent Copley and Vincent Branson pers. comm. 2009).

The assertion of identity by the Ngadjuri is complicated by their removal from Country early in the colonisation process. Since the transmission of many forms of cultural knowledge was disrupted through this removal, archaeological sites, and their documentation provide additional evidence to support the assertion of their identity (Vincent Branson and Vincent Copley pers. comm. 2009). This project provides evidence that Ngadjuri land was used in a variety of ways, supported by the numerous site types that have been documented and providing information regarding the Ngadjuri landscape and its use in the past can lend an additional level of cultural knowledge, and therefore authenticity (as perceived by the broader society), to the community.

This research therefore affirms Ngadjuri identity by contributing to the pool of information regarding the Ngadjuri of which the community is in control and can cite as evidence of their authenticity, while simultaneously collating the
data into a form that renders it more easily manageable. These outcomes enhance Ngadjuri control of their Country. By gaining control of the sites, the Ngadjuri are compelling external recognition of their custodial role in their lands. According to Ngadjuri man Vincent Copley Jr. (pers. comm. 2009):

“We know the sites are there. Knowing where our land is, what’s on it, is an important part of re-claiming culture”.

Material Culture and Identity Formation

Western science has typically privileged the spoken over the written and the written over the non-written (Derrida 1978). However, in the field of archaeology, material culture can provide an accompaniment to, or be employed in lieu of, a written or spoken record (see for example Pickering 1994; Rubertone 2000; Wilkie 2000). Archaeology as a discipline uses material culture to provide evidence for the existence of, and information about, individuals and groups of the past (Castella and Fowler 2005:1-2; Thomas 1996:11). Archaeology in a sense crystallises the identity of a group through the study of its material culture.

Politics of Identity

The political identity of Australian Indigenous groups is directly related to the way in which they were, and are, viewed by the broader society. By categorising Australia’s Indigenous population as a primitive Other, colonisers were simultaneously asserting their superiority as European (see Byrne 1996; Davis 2007). These notions were later reinforced by scientific theories such as social Darwinism (Smith 1999c:49). As a result, an ongoing
issue in the assertion of Indigenous identity in Australia has been to dispute these misguided understandings of Aboriginal culture, and put forth a more appropriate identity that recognises the fluidity of cultures and value of Indigenous knowledge systems (Stokes 1997:159).

The way in which this political identity is forged has changed over time, moving forward from one representing a pan Aboriginality which asserted its equality with and similarity to Europeans, to a more modern view where this unified identity exists alongside local and regional associations and emphasises key cultural differences (Stokes 1997). Importantly, as highlighted by Archer (1991), political self determination and re-connection with culture occur hand in hand. The acquisition of land rights is a key achievement of Indigenous politics in Australia and attaining these rights reinforces the authenticity of a group’s identity to the broader society.

Identity and Land Rights

The Ngadjuri Elders have noted that since the advent of Native Title, the assertion of Indigenous identity as taken another turn (Vincent Branson and Vincent Copley pers. comm. 2009). Native title has made individuals feel as though they must choose between which side of their family to trace their ancestry (Vincent Branson and Vincent Copley pers. comm. 2009). This has been difficult for some who do not perceive themselves as being descendant from only one group. However, gaining Native Title over ones land is seen as providing evidence to the broader society that a group does in fact “have
the right to be there” (Vincent Branson and Vincent Copley pers. comm. 2009).

Knowledge of Past Ngadjuri Landscape Use and Nation Building

The process of Indigenous nation building is inextricably linked to sovereignty, self determination and economic development: “Without sovereignty and nation building, economic development is likely to remain a frustratingly elusive dream” (Cornell and Kalt 1998:189). In a study of several Native American communities in the United States, Cornell and Kalt (1998) found two basic approaches to development, both of which seek to solve the problem of poverty and the lack of economic opportunities on reservations. The first is primarily economically focused and simply seeks to bring in investment and start businesses in the short-term. The second, termed nation building, seeks to build a long-term plan to create an environment that will attract investors. A characteristic of the nation building approach is that success is measured by social, cultural, political and economic impacts (Cornell and Kalt 1998).

The current research could be applied toward any of these ends. The social and cultural components are met through providing a tactile vision of Ngadjuri Country’s tangible cultural heritage that can be used as a learning and teaching tool, especially for the younger generation who have not visited many of the sites. The political end could be met through the potential of the final product to be used as part of a Native Title claim, and the economic facet is met both through the usefulness of the database in the management
of heritage in light of development and its potential use as part of the information made available in a cultural heritage centre, which has been discussed by the Ngadjuri as a future possibility (Vincent Copley and Vincent Branson 2009).

Cornell and Kalt (1998) noted that an unfortunate reality of the American Indian nations is their history of dependency on governmental institutions, where communities are reliant on outside agencies to accomplish their goals. In a small but important way, this project puts an element of control back into the hands of the Ngadjuri community by placing information previously held only by a government agency under their management, hence removing a small element of institutional dependency.

**Future Research in Ngadjuri Country**

Several areas for future research have been identified during the course of this project. Firstly, the project has identified numerous areas for future archaeological survey. Only small portions of Ngadjuri Country have been systematically examined. Based on a survey of 7.3% of Plumbago Station in the north, Smith estimated that 3000 to 4000 sites exist in this area alone (Smith 1980:133). Areas where only rock art has been documented likely contain numerous other sites. Additional survey will provide more data to be applied to the findings of this research, as well as toward predictive modelling.
The dating of sites in Ngadjuri Country to clarify a diachronic framework for the area would also be useful. In addition to excavation, another potential date could come from the region’s Panaramittee style rock engravings. Using an experimental dating technique, cation-ratio (CR) dating, Nobbs and Dorn (1993) suggested some of Panaramittee engravings in the Olary region were created before 40,000 BP. Although the Panaramittee style of petroglyphs was widely accepted as likely dating to the Pleistocene (Flood 2004:161; Maynard 1977; Berndt 1987), the dates reached by Dorn received extensive criticism, particularly from Beck et al. (1998) who argued that the samples were altered by contaminants. Smith et al. (2009) have recently dated calcium oxalate skins on engravings in central Australia, and found some engravings to be younger than widely expected. The application of new dating methods to the engravings would be a fruitful area of research.

A number of grinding implements have been documented on Ngadjuri Country and testing some of these for micro-botanical remains would provide data regarding subsistence strategies. Finally, analyses of smaller sub-regions as well as intra-site analyses could be useful in clarifying occupational and subsistence patterns.

**Implications of this Study for Indigenous Nation Building Internationally**

Indigenous groups worldwide have faced similar circumstances regarding dispossession of land, loss of cultural knowledge through policies aimed at assimilation into the broader society, and lack of self determination (Clifford 2001; Mattingley and Hampton 1992; Moran 2005). Indigenous nation
building seeks to re-affirm cultural identity and gain self determination (Cornell and Kalt 1998). Although years of policies were based on the assumption that the lives of Indigenous peoples would be improved by assimilating into the various cultures that colonised them (Dodson 1996:2-3; Moran 2005), it has been found that self determination provides lasting positive results where these policies have failed (Cornell and Kalt 1998; Graham 2004; Native Women’s Association of Canada 2007). Additionally, self determination and cultural renewal go hand in hand (Archer 1991; Cornell and Kalt 1998).

It is a current international priority to “encourage efforts to stabilise and revitalise the cultural identities of displaced, fragmented, and stigmatised Indigenous communities”, to “revive intergenerational cooperation and cohesion”, and to “assist in the free transmittal of knowledge to future generations that are crucial aspects to sustainable intellectual, spiritual, social and economic development” (UNESCO 2008). It is toward this end that this project has been conducted. The process of ‘returning to Country’ is embedded in the concept of Indigenous nation building. Re-gaining knowledge of landscape use, along with retaining an element of control over it, goes hand in hand with this return.
Regarding the importance of sacred landscapes Crumley (1999:271) iterated the connection between identity and place:

Culture acts like a ‘carrier wave’, transmitting information across time and space. Even when the connection between memory and meaning is severed (as when a ritual is retained but its meaning lost), information can still be delivered to future generations. The most effective carriers of social memory are landscape elements that have both practical utility and cosmic meaning such as caves, springs or gardens.

One of the objectives of ‘returning to Country’ for the Ngadjuri is to provide a sense of culture and community for the younger generation (Birt and Copley 2005:264). It could be argued that, without the involvement and interest of younger generations, Indigenous nation building cannot be successful. Though this is a very complex issue, creating a solid cultural knowledge base is an important facet of it. The role of landscape archaeology, in this case, is to provide a portion of this knowledge that may not have been documented historically, and may now not be known to communities due to displacement and/or the widely scattered nature of the sources of information which are often difficult to access.

This study has shown that landscape archaeology, particularly community-based projects, can play an important role in Indigenous Nation building. Archaeology is in a unique position to provide information regarding a group’s history that is unavailable from other sources. This is particularly important in the case of groups that have been displaced and the oral transmission of cultural knowledge disrupted. Not only is the information regarding past landscape use vital in adding to the pool of cultural knowledge available to such a group, but landscape studies are culturally appropriate in
many cases due to their holistic scope, while providing several practical applications. The use of technologies such as GIS can not only assist in the analysis of landscape use but also provide a method of leaving a community in control of data regarding the archaeological sites that have been documented on their land. This, in turn, places information that was previously typically held by government agencies in community control. This information has several practical applications, as a teaching tool for both community members and the broader society, as a method of identifying areas for potential future research, employed in the mitigation of damage to cultural resources in the face of future development and possibly, as a small part of a future land claim.

This research has shown that landscape archaeology can play a vital role in the re-acquisition of cultural knowledge, assertion and authentication of identity, and self determination, which are integral to Indigenous nation building. The placing of control over an element of archaeological sites in Ngadjuri hands also asserts Ngadjuri identity and validates Ngadjuri custodianship of these sites. Collaborative projects between archaeologists and communities to this end are likely to be highly profitable not only for the communities and researchers involved, but also in providing vital information and future directions for archaeology as a discipline.


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Appendix A
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<td>01/05/2006</td>
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<td>1430</td>
<td>Aboriginal cultural heritage survey of MaCaw Hill, SA - Ngadjuri survey</td>
<td>ACHM</td>
<td>30/12/2005</td>
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<td>Aboriginal cultural heritage survey of MaCaw Hill, SA - Kaurna survey</td>
<td>ACHM</td>
<td>30/12/2005</td>
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<td>1459</td>
<td>Aboriginal Cultural Heritage Survey: Hallett Hill Wind Farm</td>
<td>Vivienne Wood</td>
<td>30/07/2005</td>
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<td>1582</td>
<td>North Brown Hill Wind Farm, Draft and Final</td>
<td>Vivienne Wood</td>
<td>Jan-09</td>
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<td>1591</td>
<td>Archaeological and Anthropological Desktop Study of a Proposed Wind Farm Development Area, Hallett, South Australia</td>
<td>Kern Walshe and Jude Bonnell (TimeMap Pty Ltd)</td>
<td>Dec-03</td>
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<td>1598</td>
<td>North Brown Hill - Aboriginal Heritage Assessment Desktop Study</td>
<td>Sue Anderson</td>
<td>Jul-08</td>
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<td>1602</td>
<td>Aboriginal Cultural Heritage Survey of the North Brown Hill Wind Farm location, near Jamestown, SA</td>
<td>Australian Cultural Heritage Management (ACHM) - Dean Mullen and Dennis O’Brien</td>
<td>Apr-09</td>
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</table>
Appendix B
Flinders University and Southern Adelaide Health Service

SOCIAL AND BEHAVIOURAL RESEARCH ETHICS COMMITTEE

Room B1, Union Building, Flinders University,
GPO Box 2100, ADELAIDE SA 5001
Phone: (08) 8201 3116
Email: human.researchethics@flinders.edu.au

FINAL APPROVAL NOTICE

Principal Researcher: Ms Kylie Lower

Email: lowe0072@flinders.edu.au

Address: 42 William Street
Clarence Park SA 5034

Project Title: Ngadjuri Country: an Archaeological Landscape Analysis

Project No.: 4489  Final Approval Date: 23 September 2009  Approval Expiry Date: 30 November 2009

The above proposed project has been approved on the basis of the information contained in the application, its attachments and the information subsequently provided.

For projects where approval has also been sought from another Human Research Ethics Committee, please provide a copy of the ethics approval notice to the Committee on receipt.

In accordance with the undertaking you provided in your application for ethics approval, please inform the Social and Behavioural Research Ethics Committee, giving reasons, if the research project is discontinued before the expected date of completion.

You are also required to report anything which might warrant review of ethical approval. Such matters include:

- serious or unexpected adverse effects on participants;
- proposed changes in the protocol (modifications); and
- unforeseen events that might affect continued ethical acceptability of the project.

In order to comply with monitoring requirements of the National Statement on Ethical Conduct in Human Research (March 2007) an annual progress and/or final report must be submitted. A copy of the pro forma is available from http://www.flinders.edu.au/research/info-for-researchers/ethics/committees/social-behavioural.cfm. Your first report is due on 23 September 2010 or on completion of the project, whichever is the earliest. If an extension is required, please email a request for an extension of time, to a date you specify, to human.researchethics@flinders.edu.au before the expiry date.

Andrea Jacobs
Acting Secretary
Social and Behavioural Research Ethics Committee
24 September 2009

cc A/Prof Claire Smith, claire.smith@flinders.edu.au
Ngadjuri Site Spreadsheet

Due to the nature of the information included in the site spreadsheet it has not been included in public versions of the thesis. To access the Ngadjuri site spreadsheet, please contact the Ngadjuri Walpa Juri Lands and Heritage Association.