Aboriginal Cultural Heritage Regional Studies: an illustrative approach
2006

David Guilfoyle
Cultural Heritage Division
Department of Environment and Conservation (NSW)
Contents

Section 1 Introduction to regional studies 1
Definition & purpose 2
Cultural heritage places & values 2
Scale, purpose & structure 3
Four reasons for regional studies 4

Section 2 Components of a regional study 9
Types of components 10
Component 1: Community consultation 11
  Case Study 1 Community consultation 13
Component 2: Data-gathering 14
  Case Study 2 Cultural mapping 14
  Case Study 3 Documentary research 28
  Case Study 4 Archaeology and landform mapping 29
  Case Study 5 Gathering data on historical places 31
  Case Study 6 Themes and places 31
  Case Study 7 Historical themes and access to land 33
  Case Study 8 Gathering data on wild resource use 35
  Case Study 9 Places and pathways 36
Component 3: Mapping & modelling 39
  Case Study 10 Archaeological predictive modelling 43
Component 4: Planning and management 56
  Case Study 11 Integrated management 62
Component 5: Information handling & reporting 65

Section 3 Commissioning a regional study 67
Commissioning an ‘outcome-focused’ regional study 68

Appendix A: Further reading 74
Appendix B: Glossary of general and environmental terms 76
References 82

Acknowledgments 86
Definition & purpose

This report presents a general approach to conducting an assessment of Aboriginal cultural heritage at a regional scale. The field of cultural heritage regional assessment is still in its infancy in Australia. The Department of Environment and Conservation NSW is currently developing a range of tools for Aboriginal heritage regional assessment in NSW. While we expect this field to evolve rapidly over the next few years we also acknowledge the need, at this point in time, to provide our clients with an illustrative approach to regional assessments. As an illustrative model, the present document embodies many of the principles we believe should inform regional assessments. We offer it not as a prescriptive template for such assessments but as a general approach that, with the benefit of feedback from our clients, we look forward to developing and refining in the years ahead.

We anticipate a series of publications that will serve as more detailed guides for particular components of the regional assessment and planning process.

A regional assessment gathers together all existing information about cultural heritage places in a region and, in some cases, may add to the available information (e.g., by carrying out field surveys in the region). The exercise helps us to understand why these places are located where they are and thus helps us to predict where presently unidentified heritage places are likely to be found in the region. It also gives us an overview of the significances or values that these places have for people in our own society today.

The overview provided by a regional assessment helps us understand the relationship between Aboriginal people and the natural environment, the relationship between past and the present, and the relationship between cultural heritage places and the values people give them. A regional assessment gives us an overview of these relationships at a landscape scale (see Fig. 1). It also provides a context for finer-scale decisions (e.g., site conservation plans, precinct conservation plans, and regulatory decisions).

Cultural heritage: places & values

For the purposes of this guide, Aboriginal cultural heritage places are grouped into the following categories:

- pre-contact (pre-1788) places
- historical places (post-1788)
- social and spiritual places
- wild resource use places

While much of the work of a regional assessment has to do with identifying and explaining where places are found, and where they are likely to be found, it is also critical to document and assess the significance of those places (see Appendix A, 3). We must always remember that we conserve cultural heritage places not for themselves but for the significance that they have for people. We follow the Burra Charter in recognising four broad categories of significance: aesthetic, scientific (e.g., archaeological), historical, and social (see Appendix A, 4).

In acknowledging the in-principle right of Aboriginal people to ownership of their own heritage, we recognise that the social significance of their heritage places is primarily determined by their own communities (see the text box below at right). In canvassing an Aboriginal community about the value that a certain place has for them, a heritage practitioner might ask the following questions:

Fig. 1 Elements of a cultural landscape (Phillips 2002)
• Does the place stand out for the community relative to other places?
• Is the place associated with a revered member of the community (e.g., a deceased elder) or is linked to a significant event?
• Has the place been important in shaping the community’s identity?
• Is the place a reference point for the community in celebrating its identity?
• Is the place important to the community because of its use over a long period of time?
• Does the place have special cultural attributes that are valued by members of the community?

**Scale, purpose & structure**

Regional assessments differ, depending upon:

1. The purpose of the assessment (e.g., for planning; for community interest; for conservation and regulation; for large-scale development projects).
2. The size or scale of the study (e.g., bioregion, local government area, national park, large-scale development project).

These two variables influence the methodology of a regional study. However, there are certain generic methods that can be used for any landscape-level assessment, no matter what the scale or purpose of the study. For instance, a landscape-scale assessment can describe how hundreds of archaeological sites are distributed across a region in relation to the region’s physical environment. It can also describe in general terms the association that exists between the personal history of community members and different areas within the region (Ridges 2004a, p. 94).

It is important to realise that Aboriginal people have their own regional perspectives of their heritage, which often integrate the cultural and the natural into a seamless continuum. The account (see box) of a conversation with Aboriginal consultant George Martin from Deniliquin (NSW) during a visit to a Bunyip Waterhole in the Edwards River in the Werai State Forest (as recounted in Pardoe and Martin 2001, p. 132), illustrates this.

The approach to regional assessments outlined in the pages that follow attempts to be inclusive of both the community perspective, as illustrated in the text box below, and the regional perspective derived from working with the archaeological and historical data.

A number of case studies are presented, so that the general or conceptual points we make are balanced by showing how things are done on the ground in the real context of a regional assessment. (Case Studies 1 to 11).

**Hypothetical region**

To facilitate the discussion, a hypothetical region (Figure 2) is used as an example throughout this document. This region is characterised by two north-flowing rivers fed by first and second order streams originating from an upland area. This region forms part of a larger catchment area that is also depicted in Figure 2. The more localised area labelled as ‘Jack’s Creek’ is also used to explain specific points.

He showed us the deep waterhole in the bend and said they were not allowed to swim there as children [historical place]. He then told us what a good fishing spot it is and discussed that [wild resource use place]. He added that about 250 metres downstream there was a sloping area in the river bank where you could get mussels, and that the shallow water there was good for catching bream [wild resource use place]. He said there was a shell-grit oven mound [pre-contact place] nearby which showed there was shallow water because of the presence of mussels. So to George, the shell mound tells him about the environment and what he can do there, and incidentally tells him what his ancestors did there. It is not only the mound that is significant to him but the whole mound and the important aspects of the environment, which is still being used in a traditional way. On a large scale George felt the same way about the whole Werai State Forest, which had been the cultural and spiritual centre of his life when living on nearby Moonacullah Mission [historical place], and still was a very important part of his life. George has been trying to get the State Forests to fulfil their promises of looking after the many sites in the Werai State Forest, and showed us large oven mounds and burial mounds [pre-contact place] which he was trying to get fenced off from cattle and protected from rabbits [link with natural resource management].
Further information

Mention in the text of Appendix A followed by a number in brackets signals to the reader that more information about this topic can be found on the Internet. Mention of Appendix B and a number in brackets signals the reader that a specific term is defined in the glossary (Appendix B).

Four reasons for regional studies

This section briefly describes the four inter-related reasons why regional assessments are needed in cultural heritage management. They are:

1. Predictive modelling: A regional assessment predicts where presently unidentifed places are likely to exist in a region.

A regional study requires investigation of the recorded places in order to make predictions about the characteristics of the unrecorded places. These predictive statements have obvious benefits for land planners and managers.

A problem with the spatial distribution of heritage places shown in Figure 3 is that the recorded places have mostly been recorded in the course of EIA archaeological surveys (Goulding 2002, p. 11) and the focus of this recording has been on the remains of Aboriginal pre-contact (pre-1788) occupation. The distribution of the surveys, and thus the places recorded, is skewed towards the areas of the region that happen to have experienced most development activity. They are unlikely to reflect the true distribution of the region's heritage (development activity is represented in Figure 3 as the ‘mine survey’ to the north-east...
and the ‘pipeline survey’ to the east). Another problem is that the vast majority of recorded places are archaeological sites found in areas of high ground surface visibility (Appendix B, 33). Until relatively recently, very little consideration has been given to wild resource places, or post-contact places. So when we set out to collect information on what has already been recorded in any given region, we will usually find that the vast majority are pre-contact archaeological places.

**2. Cultural landscapes**

It is the landscapes themselves that ought to be considered heritage, rather than discrete and dispersed ‘sites’ within them (Byrne and Nugent 2004, p. 73).

The above quote speaks to the rationale behind regional assessments. The importance of taking a landscape rather than site-based perspective is seen repeatedly in the way Aboriginal people in NSW speak about their heritage.

This landscape perspective is illustrated in a statement of significance relating to two Aboriginal heritage places in the Illawarra region:

At Hill 60 and Boilers Point, for example, it is not just the sites of the various middens that are significant to the community, but the whole landscape in which people lived, gathered food, built houses, played and worked – the middens and the post-contact archaeology are signs of that life, rather than the only important components (Adams 2003, p. 34).

As mentioned, regional assessments identify and organise places that exist, or are likely to exist, into groups (or themes). In this regard, a regional study ‘makes sense’ of the distribution of places in the landscape—a distribution that, at first glance, may appear random and confusing. As shown in Figure 3, the distribution of cultural heritage places is represented as simply ‘dots-on-a-map.’ When examined as individual entities like this, heritage places provide only limited information. However, taken collectively, they exhibit spatial patterning that reflects the past (and often present) activity of people in the landscape and the movement of these people and their material culture around the landscape. For contemporary Aboriginal people, the significance of individual places is derived from their interrelatedness within the region. Places

---

**Section 1: Introduction**
or pathways did not exist in isolation when they were in use in the past, and so should continue to be considered as integrated parts of the cultural landscape when examined in the present.

In a regional study, therefore, an objective is to document the ‘network of places’, rather than a collection of discrete places. This means that any assessment must consider a place or an area in a holistic manner. In other words, places and pathways are to be assessed in their ‘landscape context’ rather than as individual places. The methodology required to look at the landscape context is described in Section 2, and also in Case Study 2.

In some ways, a landscape approach requires us to do things differently from what we have been used to in the current heritage management field. To explain why, it is useful to briefly consider the history of cultural heritage management in NSW. Legislation for Aboriginal heritage in NSW was enacted in 1969, with an amendment to the National Parks and Wildlife Act giving protection to Aboriginal ‘relics’. While this legislation was primarily targeted at regulating fossickers and collectors, the associated government process was primarily concerned with initiating surveys to add archaeological sites to the newly established NSW Aboriginal Sites Register. With the commencement of the Environmental Protection and Assessment Act (EP&A) in 1979, the protection of Aboriginal heritage was to a certain extent subsumed within the EIA process. Given the focus on archaeological sites and objects, the Aboriginal heritage assessment component of EIA also focused on archaeological impacts.

Aboriginal heritage surveys have mostly been conducted by non-Aboriginal archaeologists concerned mainly with identifying, interpreting, and assessing the relative significance of cultural material in terms of its archaeological or scientific value. Any Aboriginal involvement in the process was restricted to secondary roles as archaeological field assistants. There was no consideration of Aboriginal community concerns in relation to places and/or areas to be affected by development beyond archaeological sites.

The regional assessment approach advocated here seeks to go beyond this historical focus by addressing all four of the main categories of Aboriginal cultural heritage places (noted earlier). Furthermore, it provides a mechanism for assessing the significance of heritage places and areas beyond their own immediate boundaries. It asks how individual heritage places are connected to the larger cultural landscape in which they occur. This type of landscape-scale assessment is a major component of the research work carried out during the course of a regional study. An investigator is required to understand the regional context of an individual place before management recommendations can be formulated. A regional study provides an important resource in this regard.

The following quote helps us understand the cultural relevance of looking at landscapes, as distinct from individual places. It does so by drawing attention to movement as a theme (see also Case Study 7):

"Movement is a constant theme in the documentary and especially the oral sources of our study area. Any reading of Aboriginal histories elsewhere in NSW will show this to be true for the State as a whole … The emphasis placed on pathways and other routes in our landscape studies stems from a belief in their importance as cultural heritage. We know that the places we call ‘sites’ are often really just points on pathways (trajectories); they are ‘moments’ in a journey or trip across a landscape. However, because the heritage system is currently set up around the concept of the ‘site’, or heritage property, the points on the pathway have tended to dominate our thinking to the extent that the pathway itself is often lost sight of (Byrne and Nugent 2004, p. 126)."

3. Strategic conservation

Simply conducting a field survey of a region and plotting site locations on a map—prior to a development—tells us little about the factors underlying site distribution. It allows us to make recommendations only on a place-by-place basis in relation to a specific threat or conservation need. A regional study provides the information from which forward-planning decisions are developed.

The management of recorded heritage places in a region may entail direct protective measures such as erosion control, or the incorporation of a place into a conservation area. The management of the unrecorded places in a region, however, can proceed only when we are able to predict their location. That is, in order to make management recommendations that go...
some way to protect the presently unrecorded element of the cultural heritage landscape, we need to identify knowledge gaps, identify under-represented types of places or areas, and conserve representative landforms that we predict will contain a diverse number of places. Much of the following discussion is aimed at explaining how we are able to make such predictions and management recommendations.

4. Community benefits

A regional study provides a mechanism for Aboriginal people to become involved in the planning and management of their heritage. Too often in the past, Aboriginal people have been given opportunities to participate in the management of their heritage only when it is under the immediate threat of development. This is a reactionary type of involvement and is the least preferred option in the cultural heritage management process.

A regional assessment has the potential to engage Aboriginal communities at an early stage of the heritage planning process. Also, in being inclusive of all the different categories of heritage places it provides more opportunities for community engagement than would have been the case if only pre-contact archaeological sites were involved. The previous focus on pre-contact archaeology put a premium on specialist archaeological skills and methods and tended to marginalise Aboriginal people from the management of their own heritage.

More direct and effective involvement and control of the management process is a common aspiration among Aboriginal people (see Case Study 6).

At the same time, a regional study offers a number of social benefits for the community. Simply participating in the protection of cultural heritage can be a positive experience that brings children and elders together, puts people in touch with their land or ‘country’, and helps to restore a sense of identify and community belonging. In short, there are at least six benefits that an integrated regional assessment can provide to Aboriginal communities (as listed on the DEC Internet site):

- recognition of cultural association with the land or traditional ownership
- opportunity to sustain spiritual and cultural activities
- participation in park management decision-making
- protection of cultural sites and heritage
- opportunity to educate people about Aboriginal culture and contribute to reconciliation
- training and employment opportunities.

Section 1: Introduction
2 Components of a regional study
Types of components

In this section, the methods required to complete a regional assessment are discussed.

Figure 4 is a simplified depiction of the four main components of a regional assessment, together with related elements. These components are not always sequential and, in fact, the completion of one component may lead to the re-examination or refinement of a previous component.

1. Community consultation
   - Find out who to talk to and discuss the project.
   - Obtain input from the Aboriginal community and work out how they will be involved.
   - Discuss how the information gathered will be reported back to the community.

2. Data gathering
   - Access all Aboriginal heritage inventories and review records such as heritage reports, history books, and archival records to make a list of all the previously identified places in the region.
   - Consult with Aboriginal communities and individuals to collect and document any information the community would like to be considered.

3. Mapping and modelling
   - Map the places that are known to exist on the ground.
   - Identify major patterns of movement and pathways.
   - Use these data to and develop a model to predict where unidentified places are likely to exist.

4. Regional planning and management
   - Explore how these maps and models can be included in land planning and management.
   - Analyse the information in order to generate local and regional planning and management recommendations.

5. Information handling and reporting
   - Deliver the cultural heritage information to the community in agreed-upon formats.
   - Submit a community and a professional report.
Component 1: Community consultation

Introduction
The first step in any regional assessment is to conduct a process of community consultation. As we are dealing with regions that may span a number of different communities and organisations, the process is conducted somewhat differently from that which occurs for a specific place or area. The objective of this component is to discuss ways that the community can become actively involved in the development and implementation of the project. An additional objective is to establish a procedure for identifying specific areas or places that community members may wish to have recorded (for a practical example, see Case Study 1).

An approach to community consultation
Brown (2005) has outlined an approach for Aboriginal community consultation, defining four main phases. They are:
1. Project initiation (identify and contact community)
2. Forum (collaboration with community)
3. Agreement (collaborative outcome)
4. Implementation (interact; listen to and advise; inform)

Step 1. Project initiation
… in which the proponent identifies the relevant Aboriginal community(s) and engages with them in preliminary discussions to scope a regional Aboriginal cultural heritage management or planning project. This phase may involve full community meetings or meetings with recognised representatives (forums) (Brown 2005).

Step 2. Forum
… whereby representatives of the relevant and participating Aboriginal community groups are brought together (and may form a representative management and decision-making body) to discuss matters of mutual interest and concern. A forum is usually characterised by a collaborative approach to decision-making (Brown 2005).

Section 2: Components
Step 3. Agreement

... an agreement, Memorandum of Understanding (MoU) or protocol is adopted and represents a collaborative outcome for the participating parties. The agreement provides the proponent (usually a planning authority) and Aboriginal groups with mechanisms (such as strategies and/or administrative protocols) for ongoing interactions (Brown 2005).

The consultation process is always the first stage of any regional assessment, although consultation must take place throughout the course of the project. A protocol agreement that outlines how regular meetings are to take place is therefore a necessary step.

Additionally, a formal protocol document that provides assurances that any information will not be distributed to any other party without permission is an important consideration (see also Component 5). This approach was used successfully in the Coffs Harbour Regional Aboriginal Heritage study:

Undertakings were ... given [for that study] that each group would have complete control over their information and be consulted each step of the way about how information collected was being used. It was also agreed that the information collected would be collated and returned to the group at the end of the project. The acknowledgment of, and respect for, the authority of knowledge holders and the basis of their claim for controlling how their knowledge is used was of fundamental importance in setting the project off on a sound footing (Goulding 2001, p. 17).

Note that the DEC guide to publishing oral history, Talk to Print, provides advice on the protocols involved in acknowledging the intellectual copyright of Aboriginal knowledge-holders (http://www3.environment.nsw.gov.au/pdfs/talk_to_print.pdf).

There are ways of ensuring that culturally sensitive information remains confidential while still providing information in a format appropriate to the planning process. A common approach at the level of data collection is to provide a map displaying all recorded information and another map showing less detailed cultural information and site-specific locations that can be used (or viewed) in a planning context. This is discussed in more detail in Component 4.

Step 4. Implementation

... the implementation phase of the agreement may be termed a referral-based approach to engagement with Aboriginal groups ... The planning authority understands when, how and with whom amongst the Aboriginal community they should interact around particular planning decisions (Brown 2005).

This step is about establishing a commitment to these longer-term objectives in the context of a changing stakeholder environment. Priorities (or community dynamics) are likely to change over the course of a project, so it is important to have a solid foundation for ongoing negotiation. An acknowledgment should be made that circumstances are likely to change (e.g., with respect to funding or personnel) and, where possible, measures for resolving this should be proposed up front. Any agreement therefore should be community-based as opposed to individually-based. For example, any agreement between an Aboriginal Land Council Manager and a local government officer will remain largely ineffective if there is no way to ensure the broader community is being consulted. Additionally, if the individual who has made the agreement is replaced or moves on, the agreement is likely to be rendered obsolete. It may be useful to remember that the only element of a regional study that remains constant between stakeholders is a community-level interest in the protection and management of the land.
Case Study 1: Community consultation

This section summarises the consultation process completed for the DEC's Living Places Project in north-eastern NSW (Goulding 2004). For this project, a total of five Land Councils were involved and a number of visits to the region were undertaken in order to consult with Aboriginal people and other stakeholders.

A letter introducing the project was sent to each Land Council following the initial fieldtrip. A project flier was also developed and multiple copies were distributed. Researchers followed standard practice in keeping a detailed record of the consultation meetings and interviews and these were sent to Land Councils for distribution to other community members. The researchers noted the importance of establishing a forum for ongoing communication.

Regular contact was kept with key contacts in each Land Council as a way of reporting back on the results of fieldwork. A newsletter was produced and distributed after each field visit as a way to maintain contact and let everyone know about the progress of the project (Goulding 2004, p. 21). In this project the main objective was to investigate the connections people have to various post-contact heritage places in this region. Therefore, conducting interviews with individuals was a principal method of data gathering. This type of consultation 'method' is described as follows:

The strategy employed to find interviewees was premised on the notion that the more people interviewed with experience and memories of a place, the more thorough the assessment of its social value and its social significance. Access to community members was facilitated by each Land Council and with the assistance of DEC regional staff. Sometimes meetings were arranged by Land Council representatives or DEC staff; in other instances, meetings were organised directly with interviewees by phone … In some instances only one or two families had associations with a place, which made the identification of potential interviews quite straightforward. For other places, many families might have had associations and this meant trying, where practicable, to conduct interviews with at least one representative from these families (Goulding 2004, p. 21).

The interviews and meetings provide a way to simultaneously identify places and understand the value ascribed to these places: During some interviews maps were used to assist in clarifying the location of places mentioned and routes connecting these places … [At one meeting], a mud map was drawn by participants on butcher’s paper, showing the former location of houses, gardens, roads and creeks on the [Aboriginal] Reserve (Goulding 2004, p. 22).

To summarise, this project involved six main steps to complete the consultation process:

1. Introduction with the Local Aboriginal Land Councils (LALC) and DEC Aboriginal Heritage staff.
2. Compilation of a list of potential informants.
3. Distribution of introductory newsletters to LALCs and DEC Aboriginal heritage staff to pass on to relevant LALC coordinators and Elders groups.
4. Through the LALCs and DEC Aboriginal Heritage Officers, establishment of direct contact with Elders groups and individual community members using appropriate protocols.
5. Organising of a community meeting or direct interviews through the LALC or DEC Aboriginal Heritage Officers.
6. Delivery of regular updates to the LALC, Elders groups, and DEC Aboriginal heritage staff during the course of the project.
Component 2: Data gathering

As mentioned previously, a major component of a regional assessment is the compilation of data on what we already know about cultural heritage places of a region, and also what the Aboriginal community would also like to have considered in a regional assessment. There are two methods required to complete this stage: cultural mapping and documentary research (Figure 5).

Cultural mapping

Cultural mapping involves reviewing maps or conducting field visits with members of the Aboriginal community to identify the range of places and areas that they would like to have considered. In some instances, in-depth interviews with key members of the community are required to identify not only places, but also themes (explained below). This procedure contributes to the development of a regional view and is complementary to documentary research. The scale of a cultural mapping project varies, depending on the number of Aboriginal communities to be consulted and the level of information required.

Case Study 2: Cultural mapping—The Banks of the Barwon Project, Collarenebri, NSW

This project entailed a cultural mapping project with representatives of the Collarenebri Aboriginal community, north of Dubbo (Sutherland 2002). Aerial photographs were enlarged so that landscape features could be distinguished. The cultural mapping method used in this project is described as follows:

These distinguishable land features serve as visual prompts for the Aboriginal people to relate to features that contain sites and places that they know of and have used at varying times for differing purposes, for example, a patch of quandong trees, or camps, a bend in a creek that was used as a fishing spot or a stand of trees that was used for the making of implements such as coolamons. These places could be considered by the Aboriginal community as being culturally important to them. These places are then marked on an enlarged, rectified aerial or Landsat image at Aboriginal community meetings. The information that was recorded from these meetings is then taken back to the office and entered into Arcview to get Australian Map Grid (AMG) co-ordinates. A map is produced that has different symbols that refer to the various site and place types that were identified (Sutherland 2002, p. 14).
Documentary research

Documentary research is the second method of data gathering for a regional assessment. The Australian Heritage Commission (2000) provides a definition of documentary research:

Documentary research involves searching libraries, archives and museums for information relating to your study. This could be information that relates to individual places in the study area or information relating to the study area as a whole. You could find information in maps, plans, photographs, illustrations, books, articles or reports.

This information is likely to help you to describe and determine the significance of heritage places by:

- suggesting places that might have heritage value
- providing evidence about the development of heritage places over time
- describing the past and present features of places.

Case Study 3 describes how documentary research is fundamental to understanding the regional context and the link between documentary research and cultural mapping.

In the following pages we describe what is involved in gathering and presenting data on each of the four types of Aboriginal cultural heritage place listed on page 2. Each requires a somewhat different approach.

Gathering data on pre-contact sites

For this element, research aims to summarise the changing pre-contact (pre-1788) Aboriginal settlement patterns in the study region. Because pre-contact heritage concerns the period back beyond the living memory of today’s community, we rely heavily on archaeological techniques and archaeological data for our knowledge.

The Aboriginal Heritage Information Management System (AHIMS) operated by DEC is a primary resource for this.

The AHIMS database includes recording cards for all Aboriginal heritage objects and places and Aboriginal heritage values in NSW that have been reported to the agency. It also contains a database index of archaeological reports and a library of these reports. There are over 30 000 Aboriginal sites listed on the AHIMS.

(For more information go to http://www3.environment.nsw.gov.au/npws.nsf/content/what+information+can+you+obtain+from+ahims.)

This database is not comprehensive so it is important to incorporate any additional data that exist in other reports examined as part of the review process. All previous work that has been undertaken in the region should be reviewed in order to add any places that have not been listed on the AHIMS register and provide additional information for sites that are listed. This would include a review of any university research projects, EIA survey reports, and DEC on-park assessments. Archaeological places are usually grouped into site types and/or periods (see Table 1 on page 26 for a listing).

In some cases, there may be insufficient available data to adequately characterise the pre-contact heritage of a region or certain areas within a region. This often reflects the fact that archaeological field surveys previously conducted in the region have focused on particular landforms (e.g., creek margins) at the expense of others (e.g., ridge lines). In such cases it may be justifiable to carry out a limited amount of archaeological survey, within the scope of the regional study, that targets such gaps in previous survey coverage.

Archaeologists (whether Aboriginal or non-Indigenous) are trained to detect and record pre-contact traces in the landscape, such as stone artefacts and shell middens. For most regional studies, there will not be enough funding available to engage in extensive archaeological field survey, and so a sampling strategy is employed (for an example see Case Study 6). Representatives of the relevant Aboriginal communities would be involved in such a ‘targeted’ sample survey (see Appendix A, 6).

There has been a history of relationship between archaeologists and Aboriginal communities in Australia for over thirty years. As cultural heritage managers, archaeologists often also manage non-archaeological heritage places, through consultation with the Aboriginal community. Consider the following quote:
An archaeologist's view of Mutawintji National Park

Over three hundred Aboriginal archaeological sites have been recorded at Mutawintji National Park, although more exist and as yet are unrecorded. These include rock art sites, campsites with hearths and scatters of artefacts, scarred trees, stone arrangements and quarries. These archaeological artefacts and remains date from over 8000 years ago and tell us a lot about how local Aboriginal people have lived at Mutawintji since this time. All the artefacts at Mutawintji are protected by the National Parks and Wildlife Act of 1974 and are of considerable cultural and scientific value. As an archaeologist, my role is to record examples of rock art and artefacts found on site using photographic and written documentation. After the process of recording is completed, I suggest ways in which these archaeological sites should be managed and preserved, in consultation with local Aboriginal people. Mutawintji National Park is an important Aboriginal site. It is part of traditional country that has always belonged to the Pandjikali and Malyankapa people, ancestors of the present-day owners .... Although forcibly removed from their traditional country, local Aboriginal people maintain strong links with Mutawintji [see Appendix A, 10] (from the Teaching Heritage Internet site – www.teachingheritage.nsw.edu.au).

Here we see the close relationship between data gathering, cultural heritage practitioners and communities. This type of relationship is the goal of heritage management today: to ensure collaboration with Aboriginal people occurs for all cultural heritage places within a region and in all facets of cultural heritage management.

The list of archaeological places that has been gathered from existing records or through archaeological field survey, or both, is then converted into a table and linked to a GIS map of the region showing the distribution of recorded archaeological places. However, this remains a preliminary step: simply plotting the distribution of sites on a topographic map tells us little of the patterns of past behaviour responsible for this distribution. Again, in summarising this information, the aim is to describe the pre-contact Aboriginal land use systems. Figure 6 is a hypothetical map depicting the distribution of camping places and other activities across a number of different physical landscapes. This map serves to make sense of the distribution of specific archaeological places shown in Figure 3.

Figure 6 illustrates what an archaeologist, working with Aboriginal people, attempts to identify on the ground in any given region, in order to describe the patterns of movement and use within a number of different environmental regions. Studies of hunting-gathering-fishing economies suggest that people move through their territories in tandem with seasonal changes in the distribution and density of important resources (Johnson and Earle 1987, p. 112). The decision to make a camp at a specific location is dependent on a number of factors, such as proximity to fresh water, food and raw materials, and social factors such as territorial boundaries. A number of environmental factors thus influence the location of different camps and activities. However, although it is our goal is to reconstruct the pre-contact Aboriginal heritage landscape—as depicted in Figure 6—only certain traces of this regional system will be found to exist on the ground. This is because natural processes of erosion, as well as human impacts such as land clearing and development, continually affect archaeological sites. We thus need to take into consideration not only the environmental factors influencing the distribution of archaeological sites, but also the impacts from past and present land-use practices. This is an important step, because any regional model that does not take into account such biases will fall short, as it will simply extend the bias across a larger scale. It will also limit the effectiveness of subsequent management recommendations.

Case Study 4 is an example of a regional archaeological study that considers both cultural and natural factors influencing the distribution of materials across the landscape. This case Study relates also to Component 3—Mapping and Modelling and highlights the overlap between Components 2 and 3 in any regional study.
Fig. 6 Hypothetical pre-contact Aboriginal settlement pattern.
Figure 7 Hypothetical settlement pattern of an Aboriginal historic landscape.
Gathering data on historical places

The objective in gathering data for this category is to reconstruct what the historical landscape looked like and how it was used by Aboriginal people. Figure 7 is a hypothetical example of an Aboriginal historic landscape. This map demonstrates the principal types of heritage places and how the land changed from the pre-contact landscape shown in Figure 6. Later, we look at how to map ‘core areas’ of the historic Aboriginal cultural landscape.

The principal method in identifying Aboriginal post-contact places requires a systematic review of written records (documentary research) relevant to the region (see Appendix A, 9). Historical sources to be examined include, but are not limited to:

- journals of explorers and early surveyors
- blanket distribution records
- reports of the Commissioners for Crown Lands
- pastoral holdings maps
- pastoral property wages and ledgers
- police charge books
- police diaries of duty and occurrences
- police extraneous duties books
- government gazettes
- Crown lands correspondence books
- parish maps
- county maps
- school files
- Aborigines’ Protection Board Annual Reports
- minutes of the Aborigines’ Protection Board
- local histories
- academic histories
- newspaper articles
- oral history transcripts.

Case Study 7 is an example of the methods used to review such records using an example of a cultural heritage study in northern NSW. As always, cultural mapping will complement any research, because many places known to Aboriginal communities are not mentioned in any historical record.

Identifying historical places requires the expertise of both a historian to examine written documents and a historical archaeologist to examine the material evidence of what people made, built, and left behind.

Thus, the information that is gathered is derived from a diverse number of sources - whether from a field visit with the community to examine remains of an old camp site, a reference found in a history book, or a place depicted on an historic map.

Historic Heritage Information Management System (HHIMS)

The HHIMS is used for recording all information related to the management and interpretation of historic sites on DEC-managed lands. In addition, HHIMS fulfils the role of DEC’s Section 170 Register and meets the Department’s statutory obligations under the NSW Heritage Act 1977.

There are approximately 10,220 records on HHIMS, including 57 Aboriginal contact settlement sites recorded during the Aboriginal ‘Living Places’ Project. These 57 sites are recorded on both HHIMS and its sister system, AHIMS (Aboriginal Heritage Information System), because even though historic and Aboriginal cultural heritage information is separated into two systems, some sites overlap the boundaries placed on them. Contact sites fall within the historic period, but are recorded on AHIMS because they are equally important to Aboriginal people and communities today.

HHIMS divides sites into Complex and Element records. A Complex record is an overall record for a group of sites (elements) that are connected historically and geographically. For example, a pastoral station may exist on the system as a Complex with a number of Element items such as the farmhouse, shearing sheds and shearers quarters linked to it.

It should be noted that HHIMS contains only records of historic sites within the NSW national park system. The NSW Heritage Office maintains the State Heritage Inventory and the State Heritage List, both of which are able to be searched online at http://www.heritage.nsw.gov.
Thematic history

As mentioned in Case Study 7, a major step in the data-gathering process is to organise the places under historical themes. A historical thematic framework comprises the collective events and trends particular to an area, creating identifiable changes in land use, material culture, and behaviour. Key historical themes shaping Aboriginal peoples’ experience since 1788 include colonisation, settler violence and interaction, accommodation and resistance, assimilation and self-determination (Appendix B 6,27). These themes relate to patterns of Aboriginal life and identity (Appendix A,12). Within these broad historical themes are a number of more specific sub-themes that link specific places and values to the regional historical context. The use of themes is explained in more detail below, and variously throughout the course of this guide.

Heritage organisations across Australia maintain lists of historical themes as a framework for investigation. The following two statements discuss the value of thematic studies:

The use of themes helps the historian to consider all periods in the history of an item or area in a heritage study or conservation management plan, not just the most obvious ones. Themes provide the framework for identifying and assessing the remaining physical evidence for each theme on a site or within an area (NSW Heritage Office 2000).

Thematic studies are a way of looking at the history or other aspects of a place which compares it to other places or events. You can then make use of information that has already been gathered about similar places to the one in which you may have an interest (Australian Heritage Commission 2000).

Interviews and focus group workshops can be a basis for identifying themes at a community level. Maps and aerial photographs of the local area can be used during interviews or workshops to help people identify specific places and areas of historical importance to them. This is done by asking questions along the following lines:

Who is connected to the place?

Why were they living there?

What was the place like as a social place?

How is the place connected to other places?

What is the nature the attachment to the place?

What was the place like as a physical place?

When were people living in the place?

Why is the place important to you?

We combine this information (about specific places) with documentary research in order to identify regional themes. To provide one example, a thematic study of Aboriginal Missions and Reserves’ was prepared for the Centennial Parklands Conservation Management Plan, and is described as follows:

• Growth of missionary societies in the colonies was a consequence of the abolition of the slave trade (1789).
• In 1883 the Aborigines’ Protection Board was established. The government felt morally obliged to act in response to the growing persecution of Indigenous Australians by many settlers. Successive governments attempted to control Indigenous lives (Appendix B, 27).
• By the 1940s mission managers had the right to evict, remove children from families, and issue licenses for people to move around outside the mission. Family members were separated.
• Large numbers of displaced Indigenous people from the South Coast and Illawarra regions moved to the La Perouse mission. There was significant and sustained movement between the La Perouse mission and other missions around Sydney and beyond. Indigenous people tried to maintain traditional family ties and connections with each other throughout these difficult times.

The effects of, and the responses to, these historical events may be still evident in the landscape, as Goulding (2004) states:

While this movement displaced people it also had the effect of embedding them in new places where they built their lives around their homes, family and friends.

For the purposes of regional studies, we are especially concerned with identifying how historical events and themes dictated where


Pre-contact (pre-1788) site data

Aboriginal Heritage Information System (AHIMS)

Note that in addition to information on pre-contact heritage places AHIMS also contains information on post-contact (or historical period) places.

All Aboriginal objects are protected under the National Parks and Wildlife Act 1974 and it is an offence to knowingly destroy, damage or deface them without the prior consent of the NPWS Director-General. An Aboriginal object is considered to be known if:

- It is registered on AHIMS
- It is known to the Aboriginal community, or
- It is located during an investigation of the area conducted for a development application.

The Aboriginal Heritage Information Management System (AHIMS) database is a primary tool that identifies important Aboriginal Places, sites and objects across the NSW landscape. The AHIMS database contains records for 48,083 recorded Aboriginal sites, places and objects and 8,206 Archaeological reports.

The hard copies of the AHIMS Aboriginal site cards and Archaeological reports are managed by staff within the Aboriginal Heritage Information Unit, Hurstville. These documents are available to internal/external clients by appointment.

Information relating to recorded Aboriginal objects, Aboriginal places and other Aboriginal heritage values in a particular area may be made available upon request. The information is generally available in the form of a standard report from AHIMS. This report lists all recorded objects, places and values within and/or surrounding the area of interest, with each record including the identifying number; name; feature types; Australian Map Grid (AMG) co-ordinates identifying the location of the object, place or value; the date of the recording; and the name of the recorder.

If the area of interest is particularly large (e.g., a river catchment), or a local government area, or contains data of a sensitive nature (e.g., information regarding burials), a Data Licence Agreement may be required. This is an agreement between DEC and a named client, and is designed to ensure that any data supplied under the agreement are used appropriately.

The following is a list of ‘site feature’ terms that AHIMS uses. Note that more than one such feature may be present at a single Aboriginal heritage place:

- Aboriginal Ceremony & Dreaming
- Aboriginal Resource & Gathering
- Art
- Artefact
- Burial
- Ceremonial Ring
- Conflict
- Earth Mound
- Fish Trap
- Grinding Groove
- Habitation Structure
- Hearth
- Non-human Bone and Organic Material
- Ochre Quarry
- Potential Archaeological Deposit
- Stone Quarry
- Shell
- Stone Arrangement
- Modified Tree
- Water Hole
people settled, and what access they had to land (or ‘country’) to carry out activities and cultural practice. Case Study 6 describes the themes identified during a regional study in western NSW. In Component 3 below, these themes are used as an example to show how we map and model contemporary community heritage places and values.

On the HHIMS all the sites recorded during the Aboriginal ‘Living Places’ Project are organised under the thematic Association of ‘Shared Histories’ and the sub-Association of ‘Contact ‘Living Places’ Sites.

The importance of using thematic history

Identifying historical themes is an important step when gathering data on Aboriginal cultural heritage. It ensures that the full range of potential places will be represented during the course of documentary research and cultural mapping. Identifying historical themes relevant to the region under study is also the primary method for predicting or modelling where unidentified places from the historical (post-1788) period are likely to be found, as well as wild-resource use places and social/spiritual places.

Thus, Component 2 and Component 3 (Mapping and Modelling) are closely linked, and may often take place at the same time. This point also highlights the fact that the four elements of Aboriginal cultural heritage, while in some ways different, cannot easily be separated when carrying out a regional study.

In sum, when places are linked to themes we are in a position to determine the likely spatial characteristics of each theme. Identifying themes is also important for understanding when and where people could access land, and so for understanding patterns of Aboriginal settlement and movement in the regional landscape. Case Study 6 at the end of this chapter examines this link between themes and access to land in more detail, explaining how such a link goes a long way towards mapping the cultural heritage landscape.

Gathering data on wild resource use

In general, gathering data on historical heritage (see Case Study 8. This is because wild-resource use was a key theme in Aboriginal historical (post-1788) life and is referred to often by Aboriginal people in oral history interviews and biographies of Aboriginal people. Again, by linking specific places to specific themes, we are in a position to predict or model the historical trends affecting patterns of wild resource use.

Cultural mapping (including oral history interviews) for wild resource use will most likely provide much more information than documentary research. Purcell (2002b, p. 14) describes how this stage of a regional study was set up during the course of the Brigalow Belt Bioregion project:

The pilot study was conducted with the Coonabarabran Aboriginal community to develop effective methods of involving Aboriginal people in surveys for plants of cultural importance and learning new ways of recording this information. The pilot study was conducted over a five-day period and involved six members from the community. The team was assisted by an ecologist to record feedback from the study. Discussion about methods for ensuring that the Aboriginal community has ownership of the information and ways the community can communicate information to approved interested parties concluded the study.

This study used taped interviews with Aboriginal elders (see Appendix A, 7), site surveys with Aboriginal team members, and research of historical and contemporary documents, with assistance from field botanists to compile information on wild-resource use throughout the region. This type of information is to be used in conjunction with vegetation mapping to determine the potential range of wild resource use places in a contemporary context (given that vast areas of natural bushland have been cleared and developed).

The information required in considering the range of wild resource-use places present in a region includes identifying ‘potential areas’. Such areas are identified through historical documentation, vegetation maps, or field survey of areas. Such areas are usually those that contain a high density of native plants and animals as well as those areas likely to have been accessed by members of the Aboriginal community in the past. In contemporary times, communities are quite often ‘locked out’ of areas they wish to access for wild resource use (see Figure 12).
Gathering data on social and spiritual places

First, it should be understood that any Aboriginal heritage place may be of social and/or spiritual significance to contemporary Aboriginal people. A pre-contact Aboriginal burial, for instance, although it may be thousands of years old is likely to have social and spiritual value to an Aboriginal community over and above whatever archaeological or scientific value it might also have. The Burra Charter approach, which DEC advocates, provides for recognition of the multiple values that many heritage places have.

It is also the case, however, that certain places are defined primarily by either their social or spiritual significance. Dreamtime sacred sites are an example of the latter. They most often consist of natural landscape features such as waterholes and mountains whose sacredness derives from their association with an ancestral being such as the Rainbow Serpent.

An example of a place defined primarily in terms of its social significance would be a location on a riverbank identified by members of a present-day Aboriginal community as somewhere they gathered during the 1950s to socialise away from the prying eyes of mission managers and white townsfolk. It is often the case that such places do not have any archaeological remains visible on the ground surface.

The first step in gathering data on such places is to check the AHIMS and HHIMS databases for recordings that have been made of them. In addition to this, information on further such places would generally be sought by consulting Aboriginal people in the region concerned. This is where a cultural mapping approach would be advisable.

Given the regional scale under consideration here, it is unlikely to be possible to approach cultural mapping on an individual basis—i.e., by interviewing individual Aboriginal people about spiritual and social places. A successful alternative used by researchers has been to convene community forums or workshops where Aboriginal people may be willing to identify such places on maps or aerial photographs, providing basic preliminary details on the places. More detailed recording may take place at a later stage in the context of other projects.

Pathways and connections

Because Aboriginal heritage places are mostly recorded individually (e.g., an individual shell midden site on the coast) people often forget that, in terms of the lives of the people who used...
them, these sites tended to be closely connected to other places where people camped or carried out various activities such as ceremonies, wild resource gathering and artefact manufacturing.

Individual Aboriginal heritage sites/places were thus part of local and region patterns of places.

Aboriginal people often moved between several sites in the course of a single day. In pre-contact days people followed a purely hunter-gatherer economy, which often necessitated a high degree of mobility. Most often people followed fairly regular seasonal movement patterns around their tribal or clan territories.

The connectivity between Aboriginal heritage places is perhaps most clearly seen in relation to that part of the historical period within the living memory of Aboriginal people who have written or spoken about their lifestyle in the past. Many Aboriginal people have pointed out the pathways they used to go between their mission or fringe camp residences and the temporary camps and wild resource places that were in regular or occasional use.

To identify such places, a cultural mapping exercise is used in tandem with the identification of themes (as discussed above).

It is useful to illustrate this method with an example. During a cultural mapping project carried out in Oxley National Park in north-eastern NSW (see also Case Study 9), the researcher realised that the Aboriginal community members were concerned with identifying places as well as pathways, ‘to map patterns of movement through the landscape’ (Harrison 2004, p. 57).

In this project, interviewees made use of maps and aerial photographs to mark the locations of events and places they had referred to during the cultural mapping exercise, and often ‘drew a series of lines that marked both physical tracks and pathways’ (Harrison 2004, p. 122). Certain (male) interviewees marked mustering tracks that were used while working in the pastoral industry of this region. Certain (female) interviewees marked pathways between a mission and a local creek. To use the Australian Heritage Commission’s terms, these tracks were both ‘reference points in the community’s identity’ and ‘places with special community attachment developed from use and association’. Harrison (2004) uses the term mapping ‘landscape biographies’ to describe the method for mapping places and pathways identified during the cultural mapping exercise.

Aboriginal consultants during the course of cultural mapping exercises often identify pathways and corridors because they form the central feature of a person’s memory or attachment to the land. This important concept is examined in Case Study 9. This Case Study uses a number of examples to explain not only the importance of places and pathways, but also the continuities between contemporary social and spiritual places and archaeological and historical places.

**Summary of Component 2**

To summarise Component 2 of a regional study, both documentary research and cultural mapping are required to gather data on all the known/recorded places in the region under study, as well as on places that may exist but have not yet been recorded. The gathering of data on specific places important to the community is the key mechanism for making predictions about where other similar, or associated places, are likely to be found throughout the region.

To provide a specific example, Doreen Hynch from the Collarenebri Aboriginal community has described her community’s life at the ‘Old Camp’ (Sutherland 2002, p. 27). The Old Camp was the first Aboriginal Fringe Camp near Collarenebri, established in the early 1900s. This place was visited by Bob Sutherland during the Banks of the Barwon Cultural Mapping Project (Sutherland 2002, pp. 26–27):

> The areas around the Old Camp were used extensively, in particular the area known as the dipping spot where drinking water was collected and a number of other activities including washing of clothes, swimming and fishing were carried out. We made quite a few visits to the old camp dipping spot; while we were there discussions revolved around fish numbers, soil erosion, water quality, vegetation and the way things have changed.

This example highlights three points:

1. the need for Aboriginal guidance in the data-gathering process
2. the importance of both the (central) place and the areas around the place to the community

3. the fact that by identifying central places we are in a position to model or predict the spatial character of the regional cultural heritage landscape.

All the information that is gathered during Component 2 is presented in both table format and a map. To illustrate the intended outcome, let us suppose that a localised data-gathering assessment has taken place within the hypothetical region depicted in Figure 2, surrounding the area labelled as ‘Jack’s Creek’.

From this study we first organise the variety of cultural heritage places identified during the data gathering component. This is shown in Table 1. In this Table, the variety of places are grouped into one or more of the four main elements of Aboriginal cultural heritage. Each place is also linked to a major historical or contemporary theme. Additionally, information is provided about the type of place it is; when it was in use; and the major activity and/or realm of significance. All this type of information becomes especially useful for developing cultural heritage management and protection plans (discussed in Component 4).

For now, we are concerned with understanding how these places relate to each other, and so a preliminary map is often drawn up. For this hypothetical example, such a map is shown in Figure 9. This map depicts, in effect, a cultural landscape showing a collection of cultural heritage places, some of which are linked by pathways. Again, some of these places have an association to one or more element of Aboriginal cultural heritage (Table 1).

The question now becomes: how can we use this information to map and model the distribution of places across the larger region? This is the focus of the next component of a regional cultural heritage assessment, Component 3—Mapping and Modelling (beginning on page 39).
### Table 1. Organising data gathered for Component 2—a hypothetical example. This information is 'mapped' in Figure 9.

<table>
<thead>
<tr>
<th>Theme</th>
<th>Type of place</th>
<th>Date of use</th>
<th>Reference or activities</th>
<th>Figure 9 Map Ref.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Archaeological places</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pleistocene</td>
<td>Rockshelter</td>
<td>~15,000 BP</td>
<td>Overhang excavated in 1971</td>
<td>A1</td>
</tr>
<tr>
<td>Holocene</td>
<td>Lithic scatter</td>
<td>~ 3000 BP</td>
<td>Exposed on the surface</td>
<td>A2</td>
</tr>
<tr>
<td>Holocene</td>
<td>Rock art</td>
<td>2500 BP – recent</td>
<td>Distinctive motifs</td>
<td>A3/S7</td>
</tr>
<tr>
<td>Mid-Holocene</td>
<td>Quarry</td>
<td>4000 BP</td>
<td>Outcrop of chert and stone artefacts</td>
<td>A4</td>
</tr>
<tr>
<td>Holocene</td>
<td>Bora ground</td>
<td>1000 BP – present</td>
<td>Burial ground</td>
<td>A8/S4</td>
</tr>
<tr>
<td>Holocene</td>
<td>Shell middens</td>
<td>2500 BP – present</td>
<td>Series of shell mounds along river</td>
<td>A6/W6/S3</td>
</tr>
<tr>
<td>Holocene</td>
<td>Lithic scatter</td>
<td>1000 BP</td>
<td>Surface scatters</td>
<td>A6/H2</td>
</tr>
<tr>
<td>Holocene</td>
<td>Burial ground</td>
<td>3000 – 1000 BP</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Historical places</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Government</td>
<td>mission</td>
<td>1880 – 1910</td>
<td>Historical place/records</td>
<td>H1</td>
</tr>
<tr>
<td>Contact</td>
<td>Cedar camp</td>
<td>1840</td>
<td>Archaeological site with hist. reference</td>
<td>H2/A7</td>
</tr>
<tr>
<td>Government Reserve</td>
<td>Reserve</td>
<td>1920-1940</td>
<td>Govt. records; obscured by racecourse</td>
<td>H3</td>
</tr>
<tr>
<td>Conflict</td>
<td>Massacre site</td>
<td>1861</td>
<td>Historical reference, oral histories</td>
<td>H4/S2</td>
</tr>
<tr>
<td>Travel</td>
<td>Stock route</td>
<td>1880 – 1950</td>
<td>Path; navigating privately-owned land</td>
<td>H5</td>
</tr>
<tr>
<td>Ceremonial</td>
<td>Dreaming site</td>
<td>? - present</td>
<td>Spiritual place; oral histories</td>
<td>H6/S1</td>
</tr>
<tr>
<td>Work</td>
<td>Pastoral camp</td>
<td>1900 – 1930</td>
<td>Archaeological site; memories</td>
<td>H7</td>
</tr>
<tr>
<td>Living place</td>
<td>Old camp</td>
<td>1940-1960</td>
<td>Fringe camp – destroyed in 1960</td>
<td>H8</td>
</tr>
<tr>
<td><strong>Wild resource-use places</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Living place</td>
<td>Old camp</td>
<td>1940 – 1960</td>
<td>Work camp and wild resource use</td>
<td>W1/H8</td>
</tr>
<tr>
<td>Resource Use</td>
<td>Crab spot</td>
<td>1950 – 1960s</td>
<td>Good location for fishing and swimming</td>
<td>W2</td>
</tr>
<tr>
<td>Government</td>
<td>Old reserve</td>
<td>1920 – 1960s</td>
<td>Shooting kangaroos with 22s</td>
<td>W3/H3</td>
</tr>
<tr>
<td>Resource use</td>
<td>Shellfish</td>
<td>1900s to present</td>
<td>Creek/river juncture</td>
<td>W4</td>
</tr>
<tr>
<td>Life events</td>
<td>Bush tree</td>
<td>1950s and 1970s</td>
<td>Birthplace of a community leader</td>
<td>W5/S6</td>
</tr>
<tr>
<td>Subsistence</td>
<td>Rock platform</td>
<td>1000 BP - present</td>
<td>Main spot to obtain shellfish</td>
<td>W6/A6</td>
</tr>
<tr>
<td>None est.</td>
<td>Potential area</td>
<td>?</td>
<td>Native area of bush; cultural plants</td>
<td>W7</td>
</tr>
<tr>
<td>Education</td>
<td>Gathering area</td>
<td>1930s - present</td>
<td>Gathering food/medicines; teaching</td>
<td>W8/S5</td>
</tr>
<tr>
<td><strong>Social and spiritual places</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ceremonial</td>
<td>Dreaming-site</td>
<td>? – present</td>
<td>Spiritual place – oral histories</td>
<td>S1/H6</td>
</tr>
<tr>
<td>Conflict</td>
<td>Massacre site</td>
<td>1861</td>
<td>Historical reference, oral histories</td>
<td>S2/H4</td>
</tr>
<tr>
<td>Resource use</td>
<td>Rock platform</td>
<td>~1000 BP - present</td>
<td>Main spot to obtain shellfish</td>
<td>S3/W6/A6</td>
</tr>
<tr>
<td>Ritual</td>
<td>Burial ground</td>
<td>3000 – 1000 BP</td>
<td>Burial ground</td>
<td>S4/A8</td>
</tr>
<tr>
<td>Education</td>
<td>Gathering area</td>
<td>1930s - present</td>
<td>Gathering food/medicines; teaching</td>
<td>S5/W8</td>
</tr>
<tr>
<td>Life events</td>
<td>Bush lemon tree</td>
<td>1950s and 1970s</td>
<td>Birthplace of a community leader</td>
<td>S6/W5</td>
</tr>
<tr>
<td>Ritual</td>
<td>Rock art panel</td>
<td>2500 BP – present</td>
<td>Distinctive motifs</td>
<td>S7/A3</td>
</tr>
<tr>
<td>Landmark</td>
<td>Plaque</td>
<td>1970 – present</td>
<td>Signage within the National Park</td>
<td>S8</td>
</tr>
</tbody>
</table>
Fig. 9 Mapping a cultural heritage landscape (after Goulding 2004) (see Table 1).
Case Study 3: Documentary research—Goobang National Park Cultural Heritage Study

This study, undertaken by researchers within the Cultural Heritage Division of the DEC (English et al. 1998), is an example of an integrated approach to regional Aboriginal cultural heritage assessment. The involvement of an anthropologist, an archaeologist, and a historian reflects the project's stated goal of examining all heritage places and values in this region. The study provides a good illustration of the range of heritage places within this National Park.

The report begins with a comprehensive summary of the region's history, from early European exploration, to the expansion of white settlement, the mining boom, the forest industry, and the establishment of Aboriginal Reserves. The strength of this report lies in the extensive collection of oral histories and in the linking of people's perceptions with heritage themes.

The value of this approach has been noted by other researchers engaged in documenting Aboriginal places and values in environmentally similar regions:

> The report notes that Aboriginal people, in the post contact period, continued to interact with the forest by working in it, travelling though it, using it for hunting and recreation. During the mission period the forests provided an important food resource. The report noted that the Aboriginal community expressed the significance of the ranges, both in the past and currently, in a number of ways. The report noted that the area was significant to the Aboriginal community as: a source of important botanical species use for foods and medicine; a place for hunting particular animals, which have been an important food source; a place associated with a number of spirits and other beings; and a place of education in Aboriginal culture for future generations. The range of significance outlined in this report is useful for considering the significance to Aboriginal people of similar forest areas (Lucas 2000, p. 8).

The Goobang study found that there was a high level of overlap between archaeological places and historical places in certain areas, translating, in essence, to degree of continuity with pre- and post-contact history. For example:

> The archaeological survey undertaken for this project recorded that the majority of archaeological sites surveyed within the Harvey Ranges have been located on the foothills and around the watercourses such as the creeks and springs within the Ranges … the existing oral history evidence gathered in this study supports the finding of open (archaeological) sites within the foothills (English et al. 1998, p. 196).

This pattern highlights the importance of maintaining a regional focus and giving consideration to the inter-relationships between various heritage places, and such a finding is possible only through maintaining an integrated, holistic approach to Aboriginal cultural heritage. This point was clearly noted by the researchers:

> Aboriginal people rarely talk of places without commenting on their relationship to other places within their country. They speak of a comprehensive network between places that include the spiritual/religious side of life, places of economic importance, places where particular events took place and places of aesthetic and recreational value. Many places include all these values (English et al. 1998:196).

The documentation of pathways and travel routes in the study area provided an important insight into the integration of the archaeological, historical, and contemporary places valued in this region. Aboriginal consultants provided the researchers with a map (cultural mapping) showing the traditional and historical routes taken by people through this particular region:

> The map shows the high level of mobility by Aboriginal people through the region in order to meet with family and friends, other groups, attend ceremonies or camp at favourite locations, and later to travel to fulfil work obligations on the varying stations or meet at locations on the edges of established towns like Wellington, Parkes, Trewilga and Peak Hill. The map illustrates how people strategically included waterholes, followed the creeks...
and rivers and gilgai areas on route and shows how group movements have been strongly dependent on the availability of food and water resources. It dismisses the popular myth that Aboriginal people indiscriminately used the landscape (English et al. 1998, p. 197).

This report also demonstrates that people were still using ‘traditional’ pathways in more recent times to travel to work. It shows there remains a strong sense of connection to the land despite change and upheaval. Clearly, a landscape-level approach is needed to adequately define the inter-relationships between various heritage places in both the past and contemporary context.

**Case Study 4: Archaeology and landform mapping—The Western New South Wales Archaeological Program 1994–2005**

The following is a summary of some of the work being conducted as part of the Western NSW Archaeological Program (WNSWAP), an interdisciplinary research project focused on the nature and distribution of Aboriginal archaeological material (specifically, stone artefacts and associated heat-retainer hearths) in its landscape setting (Appendix B, 13). The research has been conducted in Sturt National Park (1995–1998), Fowlers Gap Arid Zone Research Station (1999–2001), and the Peery Lake section of Paroo Darling National Park (2002 and ongoing from 2005). This summary demonstrates the importance of understanding the landscape context of archaeological places (Fanning & Holdaway 2004).

**A multi-scale survey strategy**

Our survey strategy deals with three distinct spatio-temporal scales at the regional, intermediate and local levels. All three are integrated within a vector GIS, in our case ESRI’s ArcGIS. At the regional level, we utilize Land Systems mapping, a form of regional reconnaissance mapping developed by Christian and Stewart (1953) and applied to extensive tracts of Australia (e.g., Story et al., 1976). Land Systems form a convenient synthesis of the natural environment (Mabbutt et al. 1973). Since they are defined by their topographic signature using remotely sensed data (i.e., airborne and satellite imagery), those geomorphic and other environmental processes that affect erosion and deposition, and therefore the age of artefacts preserved on different surfaces, are expected to vary more among Land Systems in a particular region than within any one of them. The Land Systems are grouped on the basis of major landform types i.e., ranges, tablelands, hillslopes and footslopes; rolling downs and lowlands; alluvial plains, sandplains and dunefields; and playas and basins. With a spatial scale of the order of tens or even hundreds of square kilometres, Land Systems provide a convenient means of stratifying a region into units likely to encompass archaeological deposits with a range of different ages.

At the second or intermediate level, we focus on landform units and landform elements that make up Land Systems, as these reflect the operation of geomorphic processes over the recent or historic timescales. As well as landform types, the geomorphic units are also identified by dominant geomorphic process, as these reflect differing degrees of artefact exposure (Figures 10, 11).

We then conduct reconnaissance surveys aimed at locating concentrations of stone artefacts within the high-exposure geomorphic units. These are not considered to be sites, since the boundaries between artefact concentrations reflect the variety of processes that influence artefact visibility. Rather, we are interested in locating places within Land Systems where it is feasible...
to study the archaeological record at the intermediate level both chronologically and spatially. Thus, we do not conduct systematic survey to document all artefact occurrences, or random surveys to obtain a ‘sample’ of the archaeological record. Since we do not know what the spatio-temporal universe for such a sample would be, obtaining an unknown approximation of one seems rather pointless. Instead we are interested in finding places within a Land System where we can firstly obtain a large sample of artefacts, secondly can investigate the history of deposition and erosion, and thirdly account for differential surface visibility at the micro level. We need a large number of artefacts because we seek pattern in artefact assemblages through the analysis of artefact variability. Small samples are at times so variable that pattern is difficult to isolate.

The third or small-scale survey level concentrates on documenting local variability in land surface condition that reflects the operation of processes with a time scale of hours or days. Such processes include local erosion and deposition of sediments, bioturbation, and vegetation growth. The surface condition affects artefact visibility at the moment of survey and thus will not be comparable between one survey season and the next.

We use two methods of recording at the small-scale level, using either a total station to survey the boundaries of individual surface condition features, or visual estimates of the percentage cover of each feature in a systematic grid of 1 x 1 m squares.

Fig. 11 Map of the surface condition of one of the geomorphic units from the Stud Creek location in Sturt National Park.
Case Study 5: Gathering data on historical places—The Aboriginal ‘Living Places’ social significance project

The Aboriginal ‘Living Places’ project was a four-year study (2001-2005) that aimed to record sites in northeastern NSW where Aboriginal people have settled since 1788 as well as providing an opportunity for Aboriginal people in communities across NSW to tell the stories that make these places special (http://www.environment.nsw.gov.au/education/culturalheritage/index.htm). These places are a valuable part of the State’s heritage, and include:

- former Aboriginal reserves
- fringe camps
- pastoral station camps
- town dwellings
- seasonal work camps
- holiday camps

The project first engaged consultant historians to review the documentary historical evidence pertaining to this broad region. This evidence included material in the collections of local historical societies, library collections, archival collections (including the records of the Aborigines’ Protection Board and the Aborigines’ Welfare Board), other government and municipal records and historical maps. Given the scale of the task, the consultants were not able to search all repositories of documentary evidence relating to Aboriginal historic period settlements. The consultants were therefore called upon to use their professional judgement and experience in deciding how best to distribute their time and effort across the range of historical sources available. The guiding rule for this was a ‘top down’ approach in which priority was given to those sources most easily accessible and/or most likely to contain the information desired. The historians were required to attempt an even geographic coverage of the study area.

The list of places obtained by the historian was then given to a historical archaeologist who undertook a field survey to describe the surviving physical traces of each place (if any). Finally, a consultant anthropologist consulted with the relevant Aboriginal communities to determine the social value of each place. In determining the social significance of a place it is necessary to capture what it is about the place that is important to those people connected to it. In assessing the social significance of historical places/sites it can be useful to use an approach that distinguishes major historical themes.

Case Study 6: Themes and places

This Case Study describes the common themes identified during the course of the Brigalow Belt Bioregion study (Purcell 2002). Upon reading these themes, you realise how each has a certain spatial element that helps us to understand where certain places are likely to be found and how they are valued. The themes were identified by the researcher during consultation with Aboriginal people.

Residence: This includes the stories people told of the missions, reserves and camps where people lived in the Bioregion from the 1920s to the 1970s. Many of them are places where Aboriginal people continue to live. This provides information on locations that are not present in the documented historical record and indicates that further research would identify many more locations. The narratives demonstrate the value that people place on these sites as the locations of traditional and historical community life and cultural practices.
Rivers: Rivers are spoken of as markers of community identity, the traditional places of meetings, and the chosen location of settlements, historically and currently. They are spoken of as historically extremely rich and important sources of food. The decline of the river systems with changing patterns of land use and increasing irrigation is a source of widespread concern and distress.

Heritage (Value and management): This includes community members' views on the management of physical and documentary heritage, including the importance of Aboriginal involvement and control of the management process. It includes expressions of concern about the destruction of cultural heritage sites and items occurring in the past and the present. The need to preserve the physical landscapes, particularly the rivers and forests, as the necessary location for the transmission of cultural knowledge is highlighted.

Movement: This theme demonstrates the interlinking of the different areas of the bioregion through the patterns of people's regular movements through it for reasons of family and work. The movement of community members in established patterns interlinks historical and contemporary sites across time and space.

Community life (social gatherings): The theme includes a range of events that people remembered as social gatherings that brought together the communities in the era from the 1930s to the 1970s. Such gatherings include corroborees, dances, singalongs, rodeos, boxing, football, and church. These events are always linked to the specific places in which they occurred. They are expressions of people's memories of community strength and are one aspect of people's attachments to place and the value that people place on these sites as the locations of traditional and historical community life/cultural practices.

Work (places and people): The many narratives associated with work demonstrate the central involvement of Aboriginal people in the economic development of the bioregion throughout the historical period. The types of work include: station work, ringbarking, shearing and shed work, domestic labour, droving, brumby catching, railway work, sleeper cutting, fencing, and tobacco and cotton farming. The stories told of work demonstrate people's pride in their ancestors' knowledge and skills. Many of the narratives of work indicate the semblance of freedom that work at times provided in the era of intense control and suppression.

Land management (lock-out and environmental decline): This theme includes people's comments on the increasing restrictions that were imposed on Aboriginal access to land and water owing to changing patterns of ownership and usage, and environmental degradation and decline.
Case Study 7: Historical themes and access to land

As mentioned in various places above, the objective of a regional study is to predict ‘where people did, and could, go to carry out cultural practices’. In looking at the ways Aboriginal people use and value the land, the use of themes essentially describes changing access to land, and so is a major factor to be considered in a regional study. In a management perspective, we need to examine the conservation value of different tenure or land-use zones.

For example, in a region characterised by a majority of freehold land, Aboriginal people can only access and use corridors alongside roadways, rivers, travelling stock routes, and public lands. Even when combined, these account for only a fraction of the total land area. The chart in Figure 12 depicts the amount of land that the Aboriginal community residing within the boundaries of the Red Chief Local Aboriginal Land Council (western NSW) have access to.

The following example examines the impact of changing access to land, and how it affects the distribution of cultural heritage places.

The Biripi

Byrne and Nugent (2004) used thematic history to examine the effects of changing access to land along the mid-north coast of NSW, the traditional country of the Biripi and Worimi. The purpose was to trace Aboriginal historical settlement and movement patterns. This exercise provided a basis for predicting which locations in the region were a focus of Aboriginal activity in the post-contact period. Figure 13 is a model of Biripi Aboriginal post-contact settlement along the Manning River from the 1830s to the 1890s. Three themes were identified:

1. 1830s Early contact
2. 1860s Intensification of white settlement
3. 1890s Aboriginal–landowner Interaction.

As shown in Figure 13, each theme highlights different patterns of Aboriginal settlement and movement in this region. By understanding these historical patterns, we are in a position to predict where cultural heritage places are likely to be found in today's landscape, and also to understand where places of contemporary social value are likely to be found.

Figure 13a (overleaf): 1830s Early contact

This diagram depicts the position of Aboriginal people in relation to the early white settlers. In this model, Aboriginal people still had the freedom of movement that allowed them to access much of the river frontage as well as the higher country behind it. There was contact between them and the white farmers who were opening up agricultural clearings in the riverside gallery rainforest (dark shading in the diagram).

Figure 13b: 1860s Intensification of white settlement

The diagram depicts the intensification of white settlement on the Manning River in the mid-nineteenth century. It shows the disappearance of the gallery rainforest (the ‘brush’) along the lower
Manning; it shows the ‘filling-in’ of the landscape as the rectangular surveyed portions were appropriated and as they began to form a continuous grid of farmland along either side of the river. Large swaths of Aboriginal country now became difficult or impossible for them to access. Many of the old camp sites, resource places, Dreaming and ceremonial sites were now inside blocks of white owned ‘private property’. The grid of privately owned properties was never, however, completely continuous across the landscape. There were always those blocks and corridors, water reserves, road reserves, travelling stock routes, or other categories of Crown Reserve. These acted as ‘openings’ or gaps that Aboriginal people used to move through the grid and get access to the river and other places of importance to them (the dotted line indicates Aboriginal access to the river via such openings).

**Figure 11c: 1890s Aboriginal–landowner interaction**

This diagram depicts knowledge by Aboriginal people of the ‘map’ of white properties in the areas around the Purfleet and Forster Missions. This knowledge is most often articulated in terms of whether the landowners were friendly, neutral or hostile to Aboriginal people. In practical terms, it was this knowledge that largely dictated the paths that Aboriginal people took through the agricultural part of the colonised landscape. People might be able to cross the paddocks of friendly landowners but would have to go around the fences of hostile ones or risk trespassing. This aspect of the Aboriginal cultural landscape can, obviously, be ‘mapped’ only by Aboriginal people themselves (Byrne and Nugent 2004, pp. 23, 32, 42).
Case Study 8: Gathering data on wild resource-use places

This section outlines an approach to the documentation of Aboriginal wild resource-use places, as outlined in the book: *The Sea and the Rock Gives Us a Feed: Mapping and Managing Gumbaingirr Wild Resource Use Places*, by Anthony English (2002). This research project was carried out between 1998 and 2000 within the lands of the Gumbaingirr nation near Corindi Beach, 30 kilometres north of Coffs Harbour. The objective was to not only describe the methods for identifying the places and values linked to wild resource use in this region, but also to outline how this component of Aboriginal cultural heritage can be incorporated into the planning framework. Over 100 places linked to wild resource use were documented as part of this research, including some that have long been destroyed by development and some that community members cannot any longer access owing to restrictions imposed by landowners. Importantly, such places ‘still form part of the community’s lifestyles and sense of identity’ (English 2002). The methods involved in documenting these places included cultural mapping using enlarged aerial photos, oral history interviews, and field trips to specific places (sometimes called participative land assessment). These three methods are described here:

**Cultural mapping**

A set of eight enlarged and laminated photos was prepared for the study. These enabled people to see individual features such as stands of trees, rock platforms, tracks, houses, water features and dunes ... The aerial photos were laid out at the Yarrawarra Aboriginal Corporation’s cultural centre and the informants asked to locate and map places associated with wild resource use … Over the course of two hours, almost 100 locations representing more than a century of land use were marked (English 2002, p. 10).

**Field trips**

To assist this process, the set of marked aerial photos was taken into the field and we crosschecked the labels on the photos with the location of the places we were visiting. All of these visits prompted people’s memories about the past and created a link between the photos and the people’s personal experiences that greatly assisted the ensuing interviews (English 2002, p. 10).

**Oral history interviews**

At the beginning of each interview, the marked aerial photos were laid out on the ground and the informants were asked a set of questions about the places they had mapped (English 2002, p. 10).

Recording sheets were used to structure the interview questions, which included the following (English 2002, pp. 11–13):

1. Is the place associated with cultural significant events that are valued by community members?
2. What occurs/occurred there?
3. Who in the community used/uses the place?
4. What is/was the land tenure associated with the place and was/is permission required to access it?
5. Is the place still utilised today, and if so, what would the implications be if the community lost access to the place?
6. Does the place contain material remains associated with use by Aboriginal people?
Case Study 9: Places and pathways

Throughout this guide, it has been stated that Aboriginal cultural heritage involves the mapping of both specific places on the ground, and pathways that link these places. This is important because Aboriginal people rarely talk of a place in isolation, and by looking at pathways we have some indication of the links between places that make up a cultural landscape. The methods used in a cultural mapping exercise provide the mechanism for documenting places and pathways at the regional scale. In what follows, several regional examples are given of the recording of ‘pathways’. It also includes a description of a specific type of pathway: the travelling stock route.

Settlement and movement among the Dhan-Ghadi, north-eastern NSW

Harrison (2004) uses the term mapping ‘landscape biographies’ to describe the method for mapping places and pathways identified during consultation. In a study of the Macleay River region of northern NSW, it was the community consultation process that structured much of the research, by focusing on the community’s evaluation of an area known as East Kunderang. For instance, this area was described and understood as a ‘linking place to other locations and had a relationship with routes and movement through the landscape’ (Harrison 2004, p. 114).

The study revealed that the earliest European explorers and settlers used pre-existing Aboriginal pathways and these tracks became important stock routes, in continuous use for over 130 years (Harrison 2004, p. 117). Harrison (2004, p. 119) elaborates on this link between traditional Aboriginal pathways, and historical routes in this region:

‘[The] Dhan-gadi people on the Macleay moved regularly up and down the river valley and into the Kunderang ravines in the warmer months, occasionally moving into the tableland proper for ceremonial activity. Their well-defined tracks were not only travel routes, but ceremonial pathways ... Evidence suggests that these pathways which led to ceremonial clearings and bora grounds in the tablelands were also Dreaming tracks (Cohen 1987). The meaning of these pathways as ceremonial roads and formal routes of passage has ironically been partially erased through their use as stock routes, even though this has maintained their physical presence in the landscape.’

However, because Aboriginal people in the late 1800s and early 1900s began to play a major role in the developing pastoral industry, they continued to travel through this country following established pathways, stock routes and mustering tracks. Evidence of their role in pastoralism survives in the form of a number of mustering huts, camps, and yards that are now scattered across this region, in some cases adjacent to archaeological sites that represents the pre-contact use of a major pathway. Both these types of places have strong social value for the community. As Harrison (2004, p. 122) notes:

‘The regular seasonal pattern of movement involved in the muster became, for the interviewees, a focal point for discussing the nature of work, their perception of the landscape, and changes in the environmental health of the gorges. Those who were interviewed were keen to pass on their recollections of mustering in the gorge country. Their stories illustrate the processes, as well as the storylines, that mark their own passage through, and hence knowledge of, the rugged landscape.’

Settlement and movement among the Wiradjuri, western NSW

Another example of the importance of examining the relationship between places and pathways in Aboriginal cultural heritage is provided by Kabaila (1999, p. 304). He argues that movement is a central component in understanding regional behaviour, tradition, and change among the Wiradjuri of central western NSW:
Movement through such places became for each person part of a geographically based narrative of their lives, their life in ‘travelling mode.’ There is here a parallel to an earlier, widespread Aboriginal traditions of linking places into systems by their stories or dreamings, still found among peoples such as the Pintupi [of central Australia] (Myers 1986:60). Aboriginal social and spatial orientations to town and hinterland thus varied geographically and have not remained static through time.

Kabaila (1999:183; 185), notes the link between daily patterns of movement among the Wiradjuri before and after European colonisation:

Wiradjuri day-to-day movement was thus through a circuit of familiar places known both by their physical resources as well as their spiritual resources (stories of creation or dreaming)...After European arrival, Aboriginal people re-defined their daily lives, re-organising their travel as a framework of places along settler travel routes and at concentrations of people, [that is] the sites of early towns. The ancient travelling mode of life thus became grafted onto new patterns of Aboriginal employment and settlement, as generations of people moved between the new missions and government settlements, followed seasonal fruit picking and casual station employment, or took up travelling work such as droving, railway fettling and tent boxing.

Settlement and movement among the Bakandji, south-central NSW

A final example is from a study of Aboriginal settlement history on the Darling River in western NSW (Memmott 1991). In this study, a high degree of continuity in settlement and movement among the Bakandji community was observed, extending from traditional (pre-contact) times through to the establishment of Missions in the 1930s:

Prior to contact with Europeans the lifestyle of the Bakandji and their tribal neighbours was closely integrated with natural cycles of time: day and night, the seasonal year, and lunar cycles. People were regularly moving camp within their prescribed territories and continually building or re-building shelters, but the pattern of usage of settlements was more or less repeated on a seasonal basis ... For those people who managed to escape Mission life and who travelled from one station to the next seeking casual work in the 1930s and 40s, their usage of short term-camps resembled in many ways that of their old life. But alienation from land and its associated economic resources, together with the gradual decline of the pastoral economy ultimately led to a dependence on white welfare for these people also. The occupants of town camps gradually became more sedentary. Nevertheless residential mobility remained high within certain regional parameters, and there continued to be a type of definable socio-geographic unit (Memmott 1991, pp. 279–280).

Travelling stock routes and Aboriginal cultural heritage

The following account was written by Denis Byrne and Rodney Harrison, Research Section, Cultural Heritage Division, DEC.

Travelling Stock Routes (TSRs) were often developed alongside or over pre-contact Aboriginal travel lines which allowed for travel between reliable water sources. In this way Aboriginal people who either worked on the routes as drovers or in other roles, were continually associated with the travel lines as stock routes—and obviously used traditional water sources for the stock and human consumption.

The routes provided a range of employment for Aboriginal people and have mixed cultural values because of that association. In this way the view of the travel lines would have broadened and would have been brought into modern life. They link some Aboriginal peoples’ perspectives of the past and the present through the employment of family members as drovers and by experiencing the ongoing use of travel lines. While learning the art of droving, the Aboriginal people become quite valuable because of their knowledge of the land in times of uncertainty This is an important part of the shared heritage that the broad community holds. Following contact and settlement by non-indigenous people these areas of non-privately owned land were used not only to move through the landscape but also as prime places for living/camping outside of the formal Aboriginal reserve system...
An example of such a place is associated with Culgoa NP in north western NSW. The gazettal of a TSR over an area that had traditionally been used as a pre-contact camping place allowed Aboriginal people to continue to camp at Dennewan while other areas of land surrounding it were claimed for pastoral leasehold. By the 1860s, Muruwari people camped on the TSR had begun to form an integral part of the labour force that allowed the success of the former pastoral properties now contained within Culgoa NP. In the early 1900s a formal Aboriginal reserve was gazetted adjacent to the TSR, which recognised the continued occupation of this area by Muruwari people. The TSR at Dennewan continued to be used as a camp by both Aboriginal and non-indigenous drovers through the early-mid 1900s because of its association with public watering places and a hotel and store. Although the reserve was revoked in the 1960s, many Aboriginal people continue to return to Dennewan, and use wild resources associated with the TSR. TSRs often contain prime remnant vegetation. Such remnants may be important for Aboriginal people as sites of traditional and contemporary resource use and are very likely to have Aboriginal sites, particularly scarred trees. These places have often continued to be important to Aboriginal people because they have remained open for access while other areas have been increasingly restricted by changes in land tenure since European settlement. In such cases there is a close relationship between biodiversity and contemporary resource use values to Aboriginal communities. With approximately one million acres alongside the Western Stock Routes (roads) there is still a high likelihood of Aboriginal sites alongside many of the routes—and with the NSW Government considering the revocation of stock reserves which many statutory authorities do not want due to unsuitable size, upkeep or other concerns—there is an opportunity for the reserves to be handed back to Aboriginal communities through the NPWS or the Local Aboriginal Land Council System.

Summary of Case Study 9

The previous four sections of Case Study 9 each make a similar point about the importance of understanding movement and pathways when investigating Aboriginal cultural heritage. Indeed, critical to any regional Aboriginal cultural heritage assessment is the process of linking the array of places together, since such interconnections form the basis for a more holistic understanding of Aboriginal heritage, for making significance assessments of individual places, and for developing more appropriate management recommendations. DEC and other heritage bodies in NSW, and indeed Australia, are now actively engaged in integrating these places and broader heritage values into management procedures in order to give more culturally-relevant consideration to Aboriginal heritage in planning and management strategies. From a management perspective, such travelling routes and pathways have seldom been documented or managed for protection. Any regional cultural heritage management plan that does not give due consideration to patterns of movement and pathways is of questionable integrity and utility.
Component 3: Mapping and modelling

As mentioned previously, this Component integrates the information gathered in Component 2 into a regional model using maps and predictive models. It is not feasible to conduct a comprehensive assessment of cultural heritage places across large areas (such as a catchment) given the range of consultation and documentation required. It is, however, possible to synthesise existing information, conduct an investigation of an area(s) as a representative sample, and then extrapolate from this to other areas of the region. With the aim of describing an approach to this Component of a regional study, the more generalised methods for modelling the regional landscape for each of the four elements of cultural heritage will now be discussed in turn. Certain elements of Aboriginal cultural heritage are more amenable to predictive modelling than others, just as certain elements of Aboriginal heritage are more amenable to documentary research than cultural mapping for Component 2. Thus, there is a need to both ‘map’ and ‘model’ cultural heritage.

Mapping and modelling pre-contact archaeological places

Once we have a list of all known archaeological places in the region (whether from field survey or from existing site registers), we need to link the distribution of these places to the environmental context. This major component of a regional assessment involves identifying the specific environmental variables that may account for the patterning in the distribution of the places. The reason we link the distribution of archaeological places to landscape features is because there exist a number of commonly recognised environmental–archaeological relationships. Some of these relate to past use of the land by Aboriginal groups, while others reflect impacts to the land by erosion or land clearing. Any archaeological assessment report will identify specific relationships between the natural environment and the spatial distribution of archaeological places.

For example, an archaeological assessment project completed for a proposed mine developed was undertaken by Umwelt (Australia) (2004b, page 3.2). This report has essentially the same basic structure as most archaeological assessments completed for EIA projects in NSW. In this report, the researchers identified a number of environmental-archaeological relationships. They are:

- The pattern of watercourses and other landscape features such as ridge lines affected the ease with which people could move through the landscape.
- Certain landscape features such as crests or gently sloping, well-drained landforms influenced the location of camping places or vantage points that provided outlooks across the countryside.
- The morphology of different watercourses affected the persistence of water in dry periods and the diversity of aquatic resources and so influenced where, and for how long, people could camp or procure food.
- The distribution of rock outcrops affected the availability of raw materials for flaked and ground stone tools.
- The association of alluvial, colluvial and stable landforms affects the potential that sites will survive.
- European land-use practices affect the potential for site survival and/or the capacity for sites to retain enough information for us to interpret the types of activities that took place at a specific location.

On the basis of these kinds of relationships, a landform map is an appropriate scale on which to begin a regional archaeological assessment (see Case Study 4).
Landform mapping

To illustrate the landform-scale approach, Figure 14 depicts a landform map encompassing the Jack’s Creek area depicted as part of the hypothetical region shown in Figure 2. Also shown is the ‘cultural landscape’ depicted in Figure 9. Here it is assumed that the mapping identified eight landform units (defined in Appendix B). For this example, it is also assumed that a total of 542 archaeological sites were distributed across many of these landforms.

The number of archaeological sites per square kilometre for each mapped landform is listed in the key to Figure 14. We can see that the highest frequency of archaeological places is associated with terraces and alluvial landforms, representing the low-lying areas where major creeks are located, and especially the terraced areas of creeks that are not subject to flooding. So by overlaying archaeological location information with these landform units over a given region, we can develop models of landform and site distribution that may have wider planning outcomes. One of the major values of this approach is that it presents different scales of information, from general to specific, so information can be assessed at a level of detail relevant to our needs.

At a general level, this information allows us to characterise the relationship between landforms and archaeological site distributions in this region (while acknowledging that other regions may have different sets of relationships).

Purcell (2002) did this for the Brigalow Belt Bioregion study. For example:

The Alluvial Group of landforms – floodplain, alluvium, alluvial fan, and alluvial terrace – have strong site association. The High Terrain group of landform (colluvial slope, rocky ground and soil mantled slope) have very low site numbers. Results show that terrace landforms are high in site density because of the relationship between terrace and floodplain. Terrace landforms are gently raised above the floodplain and offer suitable locations for strategic (archaeological) campsites.
At a landform-scale, we are now in a position to formulate predictive statements about the spatial distribution of archaeological places at both the regional and local levels (discussed below). The next step is to identify the specific combination of environmental variables within and between each landform and so pinpoint particular areas likely to have been used by past Aboriginal groups. This is the basis for archaeological predictive modelling.

A landform map is compiled from a variety of other maps and mapping data, including geological, soils, topographic maps and aerial photography. Various land management authorities can provide digitised landform maps of a region being investigated. For example, the Soil And Land Information System (SALIS) is a database that contains descriptions of soils, landscapes, and landforms across NSW. It is managed by the NSW Department of Infrastructure, Planning and Natural Resources.

The following steps are suggested for preparing a landform-based archaeological map:

1. Use aerial photos to identify landforms on a 1:50 000 scale with the aid of a geomorphologist, or obtain existing landform data available from various GIS databases.
2. Trace landforms onto a topographic map or map of the region under study.
3. Digitise the map into a GIS format.
4. Conduct localised ground truthing of specific, and perhaps more complex, areas if required.
5. Overlay existing archaeological site data obtained from the Aboriginal Sites Register, from previous archaeological studies, and/or from field survey.
6. Calculate archaeological site densities by landform type.
7. Present a map of the landforms and an accompanying table showing archaeological site densities.

The landform mapping that took place as part of the Brigalow Belt Bioregion study (Purcell 2002) is a good reference for anyone about to embark on a landform mapping for cultural heritage assessment purposes.

Archaeological predictive modelling (APM)

Field archaeologists pride themselves on being able to ‘predict’ where an archaeological site will be found on the basis of scanning the physical environment around them. They do this on the understanding that hunter-gatherers were closely adapted to the natural environment, and that environment variables were a significant determinant in their choice of locations for campsites and or carrying out other activities. These choices were based on such things as proximity to water or a preference for level ground. At the same time, many locations in a region are unsuitable for most kinds of activities for similar environmental reasons, such as the presence of swamps or very steep slopes (Kvamme and Jochim 1989).

An archaeological predictive model examines the relationship between the specific location of all archaeological places in a region (e.g., slope, proximity to water) and extrapolates the relationships across the entire region. Case Study 10 describes in more detail the methods used in formulating a predictive model.

Archaeological predictive models attempt to model decision-making processes among past Aboriginal populations. For instance, an area that has easy access to fresh water, a high number of plant and animal species or suitable camping areas (e.g., gentle slope), or is at the conjunction of several different landforms, can be described as having high resource complexity and locational suitability. The logic here is that areas where a number of resources and good camping locations coincide are likely to have been a focus of Aboriginal settlement/use in the past, and this will be reflected in the presence of a high density of archaeological places. The converse applies to areas of low resource complexity and/or suitable camping locations. A predictive model aims to identify high, medium, and low areas of archaeological potential across a region.

From a planning perspective, the term ‘high potential’ (sometimes used interchangeably with ‘high sensitivity’) implies less flexibility in regional planning. An area labelled as ‘high potential’ should be assessed in more detail before any development impacts are assessed. Low potential areas offer more flexibility in regional planning but should also be examined.
further to determine if there are any special factors occurring. For instance, low potential areas may contain rare or unique heritage places that are of high social significance. A predictive model provides an option to avoid areas where significant resources are likely to exist, until field investigation can confirm their presence (or otherwise). Although field survey is still necessary prior to development, a map that indicates different levels of archaeological potential (Figure 15) is of great benefit because cultural heritage is being considered in the initial planning stage, where it is easier to modify a development and mitigate unforeseen costs.

Although there are a variety of methods for archaeological predictive modeling (APM), the intended outcome is always the same: a spatial depiction of the probability of cultural heritage places occurring in the various parts of a geographic area (e.g., proposal development area, region). APM divides a given region into small analytical blocks (such as one-hectare cells), making it particularly useful for examining regional distributions.

GIS technology now allows one to make predictions over much larger areas, allowing the overlaying of spatial data from different sources.

This spatial data might include information about slope, distance to water, food plant diversity, and soils, among others—all factors that influenced where people in the past camped and carried out activities. A good predictive model also incorporates cultural variables relating to previous settlements, transportation systems, or key subsistence patterns. Additionally, we may include data regarding the relative degree of destruction or disturbance of heritage places resulting from past development across a project area.

---

**Fig. 15** An archaeological predictive model (Ridges 2004a, p. 10). This is an example of an APM developed for the New England region of NSW (Ridges (2004a). Darkest areas indicate a high density of archaeological places, while lighter areas indicate a low density of archaeological of archaeological places. The specific dots on this map represent the distribution of known archaeological sites in this region, demonstrating how such (limited) information can be used to make predictions across the entire region.
Case Study 10. Archaeological predictive modelling

There are a variety of methods of archaeological predictive modelling, although all models fall into four main categories. They are:

- predictive modelling based on background research
- predictive modelling based on percentages of known sites associated with specific environmental variables
- predictive modelling based on regression analysis
- predictive modelling based on landform and/or terrain unit association

Predictive modelling based on background research

This type of model is based on a review of existing information to identify patterns in the distribution of Aboriginal archaeological places and is useful in the study of small or localised areas. To provide an example, Umwelt (Australia) Pty Limited conducted an archaeological assessment of an area covering approximately one square kilometre along Main Creek, approximately three kilometres north-east of the village of Camberwell, NSW. The client obtained development consent to extract coal from the area, and so the object of the project was to assess Aboriginal cultural heritage and archaeological values of the development area (Umwelt 2004a). Umwelt developed a predictive model for the study area based on the previous archaeological research and the environmental background within 6 kilometres of the project area. Predictive statements made in the report included:

- The majority of sites will be located along Main Creek and its tributaries.
- The majority of these sites will be within 30 metres of the watercourses.
- Sites will be more commonly located (due to visibility) along the minor tributaries rather than the creekline.
- Sites will also be located on the slopes. They will most commonly be on the lower/slope footslope boundary, relatively common on the upper slope/crest and least common on the midslopes.
- The predominant raw material used in artefact manufacture and visible in surface scatters will be mudstone followed by silcrete.
- The presence of scarred or carved trees is unlikely because of the heavily cleared nature of the survey area.
- Rockshelters and rock art sites will not be found, as there are no suitable outcrops to form shelters.
- Burials are unlikely to be found, as the soils are acidic making preservation of organic remains unlikely.
- Middens are unlikely to be found owing to the ephemeral nature of even the major creek line in the survey area.
- Ceremonial grounds and stone arrangements are unlikely to be located, as they are fragile in nature and generally destroyed by farming practices, including cultivation and grazing.

Such statements are useful for guiding the subsequent field survey and also for making significance assessments in the event that an unexpected pattern of site location, or an unexpected site type, is found to occur during field survey.

Predictive modelling based on percentages of known sites associated with specific environmental variables

This type of modelling is illustrated by the approach adopted in the Murrumbidgee Province cultural heritage study (Pardoe and Martin 2001). This regional study of the Murrumbidgee Province (almost the size of Tasmania) was ‘a fact-finding mission’ to reveal ‘patterning of sites in order to assist in
regional planning for the conservation of Aboriginal heritage’ (Pardoe and Martin 2001, p. 1). Given the huge area to be covered in this study, the consultation process was extensive, involving four Local Aboriginal Land Councils and other Aboriginal community members.

The researchers noted at the beginning that the body of existing data (derived largely from the AHMIS Register of the DEC) is but a fraction of the total number of archaeological resources in any given area:

307 archaeological sites and other features are held on the Sites Register of NP&WS. More than 347 sites (including more than 600 separate features) were added to this information during fieldwork in the present study. A total of 918 sites were used in an analysis of the nature and distribution of sites in the Murrumbidgee Province. On the basis of the distribution of known sites and their location, we estimate that the Murrumbidgee Province contains more than 92,000 sites or features (Pardoe and Martin 2001, p. v).

The fact that over 90,000 archaeological sites alone are expected to occur in this region, while the database of recorded places numbers just over 900, highlights the importance of thoughtful survey and sampling methods to predict the nature of the distributions of the unrecorded places in a regional context. The most useful method to extrapolate upon information from a large database is the use of predictive modelling in combination with a sampling strategy within target or representative areas.

The researchers examined the existing DEC AHMIS database of recorded sites within their study area with a view to identifying biases and determining which areas held an ‘over-representation’ of sites, so that they could then target under-represented areas in their field survey (Pardoe and Martin 2001, p. 45).

Many state registers are found to have most registered sites within easy access of a road, highlighting the sometimes dramatic bias that access can have on site distribution as seen from a site register (Richardson and Mowat 1997, as cited in Pardoe and Martin 2001, p. 45).

The targeted field survey was based on a sampling strategy, another important tool that is often implemented by necessity in a regional study. The sampling strategy used is summarised here:

The design of the archaeological survey was non-random. A completely randomised survey design would not be possible for this size of project for the following reasons:

• The expected area to be surveyed would be much less than 1% of the total area. We would not be able to choose random areas to survey, since we wished to extend the sampling to as wide a range of landforms, soils and other factors as possible.

• Considerable localised archaeological research had been done.

• Reliance on an archaeological regional model meant that survey coverage should be directed to specific areas.

• The NP&WS sites register had large gaps in site registrations that were almost certainly from a lack of investigation rather than the absence of sites.

With these considerations in mind, sampling was systematic, stratified, and hierarchical. (See Appendix B, Glossary item 30 for a definition of these sampling strategies).

In this study, as in other cases, the compilation of existing site information and the consideration given to determining whether these data were ‘representative’ was a necessary first step for developing a predictive model for application to the wider area. On the basis of this information, areas were targeted in a field survey that aimed to address the inherent biases of the existing archaeological database. After collating the new and existing information into a unified database, it was then integrated into a GIS data layer supplied by DEC that included information on
geomorphology/landforms, soil type, distance from water (including major streams, minor streams, lakes and swamps) and vegetation.

The next step was to divide the study area into a grid, thereby creating a map consisting of individual analytical cells, each cell being one hectare (100 m by 100 m) in size. Each cell was then given a score based on the likelihood that a site existed within that specific area, on the basis of the ‘predictor variables’ such as distance to water, soil type, landform etc. The score was based simply on the percentage occurrence of sites for each of the variables. For example, if 25 per cent of the sites in the database were found on ridges, then every cell on the map that fell within the landform type ‘ridge line’ received a score of 25.

Scores for variables such as distance to water were obtained by measuring the frequency of site occurrence in a designated interval. For example, if 35 per cent of sites in the database were less than 500 m from a major stream, then every cell on the map less than 500 m from a major stream was given a score of 35. A score was then given to that cell for each of the other variables, summed, and then normalised to give a value between 0 and 100. Upon assigning a colour grading from yellow (low likelihood of sites) to red (high likelihood of sites) for each cell, a ‘predictive’ map was developed (similar to that shown in Figure 14).

This map provided an indication of overall expected site density (i.e. red areas will have higher densities of sites, yellow areas lower densities). The purpose of the map was to alert land mangers and developers of the likelihood of finding sites significant to Aboriginal people while, at the same time, not displaying the precise locations of any sites (and thus respecting Aboriginal concerns regarding the publication of confidential site information).

**Predictive modelling based on regression analysis**

Carmichael (1990, pp. 216–225) explains regression analysis as follows:

> Logistic regression does not predict the actual location of sites; rather it provides a statement about the probability that a given area will contain a site. Logistic regression is a kind of linear multivariate analysis. It will provide an estimate of the relative probability of archaeological sites occurring at any point where the environmental variables can be measured. Since the aim is to develop an understanding of site patterning for the purpose of making a predictive statement, control areas were constructed. These control areas were created from locations containing known archaeological sites. Within the control areas, control points were selected systematically at 1500-metre intervals. Control points are assumed to be non-site locations. Locational characteristics of sites and controls could be compared in order to identify which [natural] variables discriminate among groups.

Eight variables for sites and controls were chosen by Carmichael as good predictors of hunter-gatherer site locations. These were:

1. horizontal distance to permanent water
2. horizontal distance to any water
3. vertical distance to permanent water (difference in elevation between a site and the closest water source)
4. vertical distance to any water (measured as above)
5. aspect, measured in degrees from UTM North
6. slope, measured in percentage grade
7. relief (difference between maximum and minimum elevation within 500 m of data point)
8. elevation.
In developing a predictive model, known sites were compared with a control group. For each variable in the model, a difference of means test was used to compare site locations with control locations. The following table is an example of the results of a regression analysis for each variable, comparing sites and controls. Note that distance to water is measured in a number of different ways, including horizontal distance and vertical distance – the latter takes the general topography into account. That is, for people moving across a rugged landscape, such as steep gorges, certain areas may have restricted access to water sources despite water sources being in close proximity.

<table>
<thead>
<tr>
<th>Variable</th>
<th>N</th>
<th>Mean</th>
<th>SD</th>
<th>T</th>
<th>df</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>Slope</td>
<td>Sites</td>
<td>353</td>
<td>4.18</td>
<td>6.59</td>
<td>1.36</td>
<td>Not significant</td>
</tr>
<tr>
<td>Control</td>
<td>2047</td>
<td>4.72</td>
<td>8.41</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Aspect</td>
<td>Sites</td>
<td>353</td>
<td>148.9</td>
<td>264.1</td>
<td>1.36</td>
<td>Not significant</td>
</tr>
<tr>
<td>Control</td>
<td>2047</td>
<td>168.0</td>
<td>240.8</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Relief</td>
<td>Sites</td>
<td>353</td>
<td>110.8</td>
<td>140.3</td>
<td>14.88</td>
<td>P = 0.0001</td>
</tr>
<tr>
<td>Control</td>
<td>2047</td>
<td>584.4</td>
<td>1399.8</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Elevation</td>
<td>Sites</td>
<td>353</td>
<td>3538</td>
<td>649.0</td>
<td>2.69</td>
<td>P = 0.007</td>
</tr>
<tr>
<td>Control</td>
<td>2047</td>
<td>3638</td>
<td>641.5</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Distance/perm.</td>
<td>Sites</td>
<td>353</td>
<td>2615</td>
<td>3614</td>
<td>5.73</td>
<td>P = 0.0001</td>
</tr>
<tr>
<td>water (vertical)</td>
<td>Control</td>
<td>2047</td>
<td>3821</td>
<td>3875</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Distance/perm.</td>
<td>Sites</td>
<td>353</td>
<td>142</td>
<td>207</td>
<td>3.06</td>
<td>P = 0.002</td>
</tr>
<tr>
<td>water (horiz.)</td>
<td>Control</td>
<td>2047</td>
<td>179</td>
<td>202</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Distance/any</td>
<td>Sites</td>
<td>353</td>
<td>383</td>
<td>494</td>
<td>2.72</td>
<td>P = 0.006</td>
</tr>
<tr>
<td>water (vertical)</td>
<td>Control</td>
<td>2047</td>
<td>461</td>
<td>525</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Distance/any</td>
<td>Sites</td>
<td>353</td>
<td>38</td>
<td>91</td>
<td>-1.31</td>
<td>Not significant</td>
</tr>
<tr>
<td>water (horiz.)</td>
<td>Control</td>
<td>2047</td>
<td>32</td>
<td>72</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

N: number of sites; SD: standard deviation; T: index of magnitude of the effect each variable has on predicting the outcome; df: degrees of freedom (number of observations used to test the effect of each variable on predicting the outcome).

A formula was created using (L) a logistically derived discriminant function.

\[
p = \text{probable site location} \\
L = \text{discriminant function} \\
e = \text{natural logarithm } L
\]

The discriminant function is derived from the logistic regression estimates (excluding those variables that are not significant). \(L\) is computed according to the following equation:

\[
L = 0.0494243 - 0.0001201 \times (\text{horizontal distance to permanent water}) - 0.00112131 \times (\text{relief}) - 0.0012322 \times (\text{horizontal distance to any water}) + 0.00376 \times (\text{vertical distance to permanent water})
\]

Thus for any location, distances to water and relief will change, but these attributes of a position are adjusted by values produced from logistic regression estimates. This logistical regression predicts the probability of site presence at a given measurable location expressed as a value between 0 and 1. Locations with values greater than 0.5 have more than a random chance of being a site and are predicted site locations. Locations with values below 0.5 are very unlikely to be archaeological sites. Given these parameters the model can be executed in a spatial (GIS) database.

**Predictive modelling based on landform and/or terrain unit association**

This type of predictive modelling was described in various sections above. It is advocated as the best-approach to predictive modelling for regional studies aimed at characterising the ‘cultural landscape’ because it provides some context for investigating variation of archaeological site potential within and between landforms specific to the region.

As Umwelt (2004b, p. 7.3) state:

… terrain analysis can be used to test hypotheses about different occupation activities/evidence based on proximity to reliable water, easy routes across elevated country, whether elevated rugged features separate groups/activities, the importance of former creek banks, etc.
Landform mapping and predictive modelling

The combination of landform mapping with predictive modelling provides a more powerful tool for modelling the regional cultural heritage landscape than either method used on its own. Figures 16 and 17 provide an example of these complementary methods, using the example of the hypothetical region depicted in Figure 2. Figure 16 represents a more detailed type of landform mapping than the example shown in Figure 14, and uses ‘degree of slope’ to isolate variation within landform groups. This is sometimes referred to as the mapping of landforms with terrain units (defined in Appendix B).

In Figure 16 we note that the two hypothetical river drainage areas have a similar configuration of landforms characterised by flat floodplains with moderate mid-slopes and alluvial terraces. They also have a similar pattern of archaeological potential. However, as depicted in Figure 17, the western river has a larger area of high archaeological potential. This might be due to the fact that the western river has a higher measure of resource complexity (e.g., more dense wild resources) and locational suitability (eg., flat, better-drained terrain). It may also reflect the fact that this area has been less disturbed by clearing and other land developments. In some instances, similar landforms have different archaeological potential (moderate or high) and this might be due to differences in the proximity to other landforms (or resource diversity).

The usefulness of combining landform mapping and archaeological predictive modelling is perhaps more clearly seen in the upland area depicted in the centre of this hypothetical region. This area is characterised by steep, rugged terrain and has a number of different landforms but has an overall low archaeological potential. This is most likely because the region was used differently in the past than were the adjacent low-lying areas. For instance, the central area was perhaps used for more specialised activities such as stone raw material quarrying (for making tools), or perhaps the gathering of specialised, seasonal resources. However, there are certain areas within this upland region that have a moderate archaeological potential and correspond to landforms such as ridge

Some considerations for archaeological predictive modelling

The value of any archaeological predictive model is recognised once the patterns have been interpreted and the limitations identified. A predictive model itself is not an outcome. Rather, the outcome or usefulness of a model is delivered once the model is interpreted. For instance, when the goal is to incorporate a model into land planning, some mechanism to show the relationships between high-potential and low-potential areas, rather than simply defining their boundaries, would help clarify the regional ‘structure’ of Aboriginal heritage places. This follows from the fact that regional patterning is influenced not only by the environment, but also by a range of cultural factors (Umwelt 2004b:7.3). So although the ‘analysis of the physical structure of the landscape facilitates discussion of a range of environment related archaeological issues’ (Umwelt 2004, p. 7.3), we can only ever hypothesise about the influence of the cultural factors affecting decisions made by Aboriginal people on their use of the landscape in prehistory. In practical terms, this means that a predictive model is unlikely to describe how people used the landscape in the past in ways that were independent of any environmental feature(s). The focus on environmental parameters heavily skews a predictive model to the most common archaeological places. That is, in denoting areas of high potential, a predictive model is denoting only areas of high site density. A number of significant places (such as burials, ceremonial places) can be expected to occur in areas outside the dense zones. Furthermore, it is likely that the majority of contemporary heritage places valued by people today are in areas that are in fact outside these ‘favourable’ or dense areas of past settlement. Predictive models rarely consider such factors as ‘access to land’ that affected where Aboriginal people could and couldn’t go during the post-contact period.

Section 2: Components
lines. Landforms such as these in this type of environment were perhaps used by Aboriginal people as travelling routes through a rugged landscape.

So despite the fact that the central area has low potential (compared with adjacent areas), the potential varies as a result of different landform configurations creating favourable places to carry out these more specialised activities. In short, the combination of landform mapping and archaeological predictive modelling provides a mechanism for identifying variation of archaeological potential within and between landforms across a region. Using only one method on its own would limit our ability to make informed predictive statements and planning recommendations (see also Component 4).

Fig. 16 Mapping landforms with terrain units
Relative archaeological potential

- Very low
- Moderately low
- Moderate
- Moderately high
- Very high

Fig. 17 Predictive model based on landforms and terrain units.

Section 2: Components
Mapping and modelling of historical places

In this step, the objective is to predict the major types of Aboriginal historical heritage places (i.e., places dating from after 1788) likely to exist in the study region. This takes place once the documentary research has been completed, historical themes have been identified and a list of known and potential historical heritage places has been compiled.

To begin with, we need to identify the major types of Aboriginal settlement within the landscape for each historical theme that we have previously identified. To illustrate the method with an example, Figure 18 is a map of the Yass District in central NSW. It shows a number of central places and illustrates the use of a spatial model to predict where other such places are likely to be found in this region. The range of Aboriginal historical settlements is mapped, and the interconnections between the various places are drawn out. This provides a spatial context for the particular region under study that will complement any information gleaned from the completion of Component 2. Furthermore, it allows us to predict where less obvious places are likely to be found in the region, using a concept such as the ‘backyard zone.’

The concept of the ‘backyard zone’ developed by Byrne and Nugent (2004, pp. 125–127) as a means of understanding Aboriginal post-contact landscapes is one of the few attempts at modelling and predicting Aboriginal post-contact heritage (see Appendix A, 9). The approach provides a method for identifying the types of places to be found within a region on the basis of a thematic, regional history. The basic tenet of this approach is summarised by Byrne and Nugent (2004, p. 125):

Aboriginal people in the historical period (the post-1788 period) did not live their lives confined to the Reserves, fringe camps, and other settlements: much of their daily life was spent in areas surrounding these places.

Factors such as how far a person could walk from one of these central locations in a day, historical settlement distributions, and natural features such as rivers and ranges might be understood as ‘constraints’ on movement and settlement that define the ‘backyard.’ As discussed in Case Study 6, constraints on movement and access to land are a major theme in Aboriginal history. We gain an understanding of these constraints during the data-gathering component of a regional study. There is thus a strong link between Components 2 and 3 in a regional study:

By understanding the constraints on Aboriginal settlement we are in a much better position to know where to look for the heritage of Aboriginal post-1788 settlement (Byrne and Nugent 2004, p. 125).

The ‘shape’ of the backyard zone will vary from region to region (Byrne and Nugent 2004, p. 127). This is explained further in the section on mapping and modelling social and spiritual places.

---

Fig. 18  Modelling the Yass District historical landscape (Kabaila 1999).
Mapping and modelling of wild resource use

For a wild resource-use map or model, the lists of known places are first gathered and then mapped (as described in Case Study 8). Some places (associated with wild resource use) will consist of quite small areas of land, while others may encompass large areas (e.g., customary hunting and gathering territories). Such a map forms the basis for making predictions about the regional distribution of wild resource places and also provides a framework for more detailed investigation of specific areas within the regional landscape.

The second step is to map potential wild resource-use areas by examining vegetation and land tenure maps. To facilitate this step a landform map may be drawn up that shows the predicted location and density of bush food plants in different landforms and vegetation communities. A cultural plant survey would also be well suited for integration with the landform mapping because landforms influence plant diversity (Purcell 2002, p. 14).

A common method for predicting the distribution of wild resource-use places is to identify the relative densities of ‘economic’ plants - i.e., those that are edible, medicinal, or can be used as raw materials. This information is obtained from botanical survey data, vegetation maps and/or field survey. Such a map would be similar to what is depicted in Figure 19.

Additionally, the methods described in Component 2 would be used to determine how certain historical themes affected past access to land and therefore the places where people could and could not go for access to wild resource. Access to land is a major factor influencing patterns of Aboriginal movement and wild resource use, and we need to understand how this has changed over time (see Case Study 7). By understanding these historical patterns, we are in a better position to map and model the spatial distribution of wild resource use. In effect, we are less concerned about predicting the distribution of economic plants and more concerned with predicting ‘where people could go’. For instance, a certain plant food might be common across a region, but the places where Aboriginal people could actually access this plant might be found only in one or two specific places. In this respect it is perhaps more appropriate for land managers to focus on the conservation of relevant ‘accessible’ areas of land, including corridors such as stock routes and roadsides, in order to protect the Aboriginal wild resource use landscape.

Figure 19 is a hypothetical map showing three things: documented wild resource places, general areas of high cultural plant diversity, and areas that can be accessed by the Aboriginal community. We can predict that the areas where these three layers overlap will hold high social significance and also high conservation value (discussed below).
Fig. 19  Modelling the wild resource-use landscape.
Mapping and modelling of social and spiritual places

There are two main steps required when mapping and modelling social and spiritual places. The first is to construct a map identifying the spatial characteristics of social and spiritual places. Goulding (2002) has summarised these spatial characteristics:

...some places will have no clear boundaries, whereas others could be clearly ‘mapped’ and integrated into a GIS. Obviously, different kinds of places had different levels of significance and different management requirements. Starting with the baseline information recorded about the locations of places, zoned areas of cultural sensitivity are developed. Unassessed areas are also to be mapped so as not to give the impression that they were devoid of cultural values.

The type of map that is produced is illustrated in Figure 20, where those places and pathways that have been identified by the Aboriginal community have been mapped.

![Fig. 20 Modelling the social/spiritual landscape.](image-url)
The only way to produce such a map is to consult with the community. While such maps are generally drawn at a very broad scale, they do provide a framework for a more localised investigation of specific areas within the region. Figure 20 also depicts those areas identified by the community as ‘access corridors’. Such areas are important for future regional planning and management strategies, as these are areas that are likely to contain a high density of heritage places. Additionally, such areas hold the highest potential for enabling contemporary Aboriginal people to maintain connections to the land, and also contribute to the management and protection of both cultural and natural heritage.

In this way, regional studies have enormous potential for ‘restoring connections’ to land for contemporary people. This comes through identifying places and areas that may have been ‘lost’ over the years. In some cases, a regional study may identify areas that remain undeveloped, exist in conservation areas, or are areas earmarked for bushland recovery that also have high cultural heritage significance. Identifying such areas with which contemporary people could (potentially) re-engage for cultural practices is an outcome of a regional study that is seldom considered.

The second step during this component is to map and model contemporary themes that are identified during the consultation process. This is required because we need to understand how places are linked (geographically and culturally) in the landscape. Mapping the social and spiritual landscape is also about understanding how the communities hold attachments to the landscape. This is illustrated in Figure 21 using some of the community themes identified during the Brigalow Belt Bioregion study (Purcell 2002).

By using the method of linking places to themes described in Component 2, we have a way of determining how themes/places are distributed across the entire region being investigated. To do this requires the derivation of a representative sample of themes and places from documentary research and cultural mapping. It is expected that many of the identified themes will be connected with places associated with the other elements of Aboriginal cultural heritage. For instance, a historical place such as an old fringe camp would be expected to also be an important ‘social’ place for the community. This kind of inter-relationship...
was also demonstrated in Table 1 and Figure 9. For this category, as is discussed in Component 5, any culturally sensitive information is not to be mapped, or is mapped at a large scale so as not to disclose the specific location of a place that the community may wish to remain confidential.

In Figure 20, we can see that by mapping these themes we are in a position to model the distribution of heritage places in areas that are not well documented. For instance, if we understand that ‘places where people worked’ is a major community theme, we can then conduct a history of an area to determine the nature of Aboriginal employment in this little-known area. Such a historical review may, for instance, reveal that this area has a long history of involvement by Aboriginal people in the pastoral industry. A ‘model’ can then be developed that identifies how the pastoral industry is manifest in this landscape in relation to Aboriginal history (in a similar manner to what was described in Case Study 7).

Referring to Figures 19 and 20, the following account of heritage places in this hypothetical landscape illustrates the manner in which the landscape is culturally integrated, rather than merely consisting of disconnected individual heritage places:

The landscape in the area concerned contains two rivers and a mountain. There is one scarred tree near the river, berry bushes, and three non-local (exotic species) trees planted at the base of the mountain. There are two artefact scatters and a deposit of shell material at the confluence of the two rivers. There are also three old huts.

It can often happen that such places are recorded by heritage professionals (or others) simply as individual, unrelated sites, which is what they may appear to be from an archaeological standpoint. However, effective involvement of the Aboriginal community and careful assessment of the full array of potential Aboriginal heritage provides an alternative picture, as follows:

The artefact scatter on the southern shore is related to the significance of the river as a teaching place for passing on dreaming stories to children about the use of the river’s resources and about the sacred mountain that can be seen to the east.

The artefact scatter on the northern bank is associated with the scar on the spotted gum tree. The tree’s bark was used to make coolamons to collect leaves for ceremonies on the mountain.

The shell material tells us of the use of the river and its food resources over thousands of years, and [the river] is also a birthing place which is significant as a women’s place. The three snow gums planted at the base of the mountains were traded from the mountain people to the west to mark the beginning of a men’s ceremonial area.

The three old huts were once foresters’ houses and hold significance for the local Aboriginal community due to their long history of work in the forestry industry and the positive relationships that grew between Aboriginal and non-Aboriginal forest workers.

By using the concept of cultural landscapes, a story behind the features can be told which demonstrates the associations that may exist between Aboriginal objects and other features within the landscape.

[The above text was authored by David Major, Department of Environment and Conservation (NSW)]

This example demonstrates the inter-relatedness of cultural heritage places and helps explain why mapping and modelling of social and spiritual places involves integrating all the information together in a format that characterises the contemporary cultural landscape.

Section 2: Components
Component 4: Regional planning and management

This component is about incorporating regional assessments into regional plans. It serves as the fourth component of a regional study. To begin with, we need to be clear as to why this component is important:

There are several reasons why strategic, regional conservation planning is worth attempting: assisting other planning processes, considering land-use scenarios, coordinating mitigation strategies region-wide, and protecting places with potential conservation value in areas where surveys have not been conducted ... effective strategic planning requires a focus on cultural landscapes, the use of predictive models, modelling threats to sites, quantifying the representativeness of existing protection measures, setting conservation goals, and the use of conservation planning software tools (Ridges 2004b).

The following section provides a detailed illustration, using hypothetical data, of what is actually involved in formulating planning and management recommendations. (Case Study 11 looks at cultural heritage management and its links with natural heritage management).

Quantifying places

One of the main aims of a regional study is to characterise the range of cultural heritage data within a region and identify the significance of cultural heritage at a landscape level. An additional goal is to determine the scale of protection needed for different areas within a region. This is in contrast to site-specific recommendations that often propose site monitoring or impact avoidance as a management strategy. This section outlines a general approach for developing planning and management recommendations at the regional level.

The first step is to identify the number of places in the region relating to each category of cultural heritage.

To provide an example, Tables 2 and 3 show the number of places found within the hypothetical region depicted in Figure 3. These Tables are loosely based on Ridges (2006) and the reader is encouraged to review his work for quantifying regional cultural heritage for management and planning. The table includes the percentage of places that are within lands administered by the NPWS, thus indicating the percentage of sites that are protected by virtue of being inside conservation reserves.

Table 2. Number of recorded places in the region*

<table>
<thead>
<tr>
<th>Element</th>
<th>No. of known sites</th>
<th>% in NPWS</th>
</tr>
</thead>
<tbody>
<tr>
<td>All locations</td>
<td>790</td>
<td>21.5</td>
</tr>
<tr>
<td>Pre-contact archaeological</td>
<td>542</td>
<td>26.5</td>
</tr>
<tr>
<td>Historical</td>
<td>91</td>
<td>37.7</td>
</tr>
<tr>
<td>Wild resource use</td>
<td>51</td>
<td>15.6</td>
</tr>
<tr>
<td>Spiritual</td>
<td>75</td>
<td>2.0</td>
</tr>
<tr>
<td>Social</td>
<td>15</td>
<td>53.8</td>
</tr>
</tbody>
</table>

* Note: these categories are at the broadest scale and are used here for illustrative purposes. We could do the same for the various types of places (and/or themes) that fall within each of these elements of Aboriginal cultural heritage for a more localised or longer-term study.

By compiling this list of known places during the course of Component 2 (for one part of a region), we can then estimate the number of places that occur across the entire region. This is represented in the first column of Table 3, labelled as ‘modelled’.

Table 3. Estimated number of ‘unidentified’ places across the entire region.

<table>
<thead>
<tr>
<th>Feature</th>
<th>Modelled</th>
<th>Filtered</th>
<th>% Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>All locations</td>
<td>47652</td>
<td>28472</td>
<td>40.2</td>
</tr>
<tr>
<td>Archaeological</td>
<td>22965</td>
<td>13877</td>
<td>39.6</td>
</tr>
<tr>
<td>Historical</td>
<td>1584</td>
<td>826</td>
<td>47.9</td>
</tr>
<tr>
<td>Wild resource use</td>
<td>10846</td>
<td>5882</td>
<td>45.8</td>
</tr>
<tr>
<td>Spiritual</td>
<td>155</td>
<td>119</td>
<td>22.8</td>
</tr>
<tr>
<td>Social</td>
<td>1538</td>
<td>1242</td>
<td>19.2</td>
</tr>
</tbody>
</table>

A ‘filter’ is a method that takes into account land use practices (such as clearing or urban development) that have destroyed many thousands of heritage places throughout the region in the period since white settlement (refer to Ridges 2004b for a detailed example of the methodology). This is represented in the second column of Table 3, labelled ‘filtered’. The third column here is the percentage of places estimated to have been lost across the entire region owing to unplanned development. So for example, almost 50 per cent of historical places have been destroyed by unplanned development. This figure would be a close
estimate of what has been lost owing to the large-scale housing developments and urban expansion in NSW. In contrast, only just over 20 per cent of spiritual places in this region are estimated to have been destroyed: this relatively low level of destruction is presumably due to the fact that many such places are found in environments least likely to be developed (such as prominent, natural features in the landscape). A system such as the one described above allows us to determine the extent of loss in different areas within a region and provide a context for making land management decisions. For instance, the ‘C-Plan’ model can isolate areas (or landscapes) within a region that are likely to contain a number of places that would assist in preserving a representative sample of cultural heritage places (see Ridges 2006).

Formulating recommendations

After we have quantified the information in the above manner there are four questions that need to be addressed to assist in management and planning. They are:

1. How is each element of cultural heritage manifest in the physical landscape of the region?
2. How well represented is each element in this region?
3. What significance is attached to each element?
4. What type and level of protection and management is required for each element at the regional level in order to conserve its significance?

The following pages provide examples of the types of responses that are formulated in addressing each of these questions at the sub-regional level. To provide some context to this discussion, it is assumed that an assessment project has been carried out for the hypothetical region depicted in Figure 3 (with Components 1 to 3 having been completed).

Management of the pre-contact archaeological landscape

**Manifestation**

A total of 542 pre-contact archaeological sites are known to exist in this hypothetical region (Table 2). On the basis of their distribution, it is estimated that over 22 000 additional (yet to be discovered) sites exist. A landform study identified river terraces (a landform feature frequently occurring across this region) as containing a high density of archaeological sites. The majority of these places are expected to date anywhere from the recent past back to 5000 years ago, with earlier sites buried by deposition associated with periodic flooding. The areas of remnant native vegetation, in particular, are expected to contain significant archaeological sites, given their relatively undisturbed context and their favourable locations close to the river. Less numerous, but highly significant archaeological sites—such as rock art sites and burials—are also likely to be found within the region, especially in the areas of rocky outcrop and within the sandy areas toward the west. There is some evidence to suggest, however, that art sites are commonly located at the juxtaposition of several landforms. Thus, it is suggested that the full range of pre-contact settlement is manifest in a number of different landform units. Currently, high potential for archaeological deposits (Appendix B, 26) such as shell middens, stone artefact scatters, and open camps, are to be found on the alluvial terraces through the central-east portion of the region, especially in undisturbed areas of native vegetation.

**Significance**

Undisturbed archaeological sites that are found in this region are expected to have high scientific/research potential. If under-represented archaeological sites were found (such as rock-shelters, rock art sites) they would be highly significant, especially any site dating to the Early Holocene and Pleistocene, owing to the limited state of our knowledge of the Pleistocene in this region. Aboriginal consultation carried out during the course of this project has also demonstrated that many people value places such as those that hold the material remains of the activities of their ancestors. Any human skeletal material is assumed to be of important social significance in this regard.

**Representation**

Compared with all other elements of cultural heritage in this region, archaeological places are well represented. However, there is a high level
of variation within this category. Older sites, such as those dating to the Early Holocene and Pleistocene, are under-represented (Appendix B, 19, 24). A number of reasons are given to explain this under-representation. The first is that it appears that Aboriginal groups of the Pleistocene practised a highly mobile hunting-gathering lifestyle and so traces of their activities are more ephemeral and dispersed than traces dating from later periods. Second, geomorphic processes of sedimentation across vast areas within this region have presumably buried many traces of activity from this period. Third, most of the recorded databases of pre-contact archaeological sites in this region are open stone artefact scatters that have not been linked to any specific theme or temporal period. It is suspected that many sites that may have an Early Holocene of Pleistocene association have not been identified as such. Additionally, certain types of sites such as modified trees (e.g., scarred trees) and shell middens appear to be under-represented in the region. Conversely, open camps (manifest as stone artefact scatters) are well represented, relating to the fact that stone artefact scatters have much higher levels of visibility and survival rates than all other archaeological places/site types.

Protection and management

Given that many archaeological places remain buried, their protection becomes an issue when activities are proposed that will entail large-scale earth-moving or other ground disturbing measures. The types of environments where these sites are commonly found would require relatively intense protective mechanisms such as ongoing on-ground monitoring of the condition of the sites. Protecting certain landforms or areas that have a number of juxtaposed landforms would be an appropriate method to ensure the full range of sites is being protected. Land clearing should be minimised in alluvial landforms within this region, including the upper catchment areas below colluvial slopes and along alluvial terraces, owing to the expected presence of significant archaeological sites within these types of landforms. Rocky areas and aeolian sheets, although containing fewer archaeological sites, are expected to hold high cultural value due to the potential for rock art and burial sites. However, such areas could be easily managed given that they represent those areas least likely to be threatened by cultivation or clearing.

There is a need to gather more primary data on the archaeological record for the region (and especially the Early/Holocene and Pleistocene record) to allow the formulation of more direct protective mechanisms and significance assessments. This would require targeted field surveys in areas outside the environments where most of the previously recorded archaeological sites have been found (to account for any bias in this data). Further investigation would also help in better describing pre-contact sites and materials and so assist in their accurate identification on the ground. There is a need to conduct an investigation into how the different site types are inter-related and dispersed amongst different landform units, in order to assist in the formulation of more systematic planning recommendations.

Management of the historical landscape

Manifestation

Evidence of post-contact themes in the region is to be found in the total of 91 known historical archaeological sites and living places. It is estimated that over 1500 additional places exist within this region. The archaeological potential of these places is assessed as minimal (it consists of possible remnants of structural foundations and associated artefact scatters). However, it is expected that such places have high social significance. There is a potential for historic-period Aboriginal places to occur in the northern sector of this region. A regional history project has revealed that in the 1900s a large Aboriginal fringe camp was established on the outskirts of the town further upstream from this region. In the 1930s this camp was bulldozed and many of the Aboriginal people in the area were sent to the Aboriginal Reserve in the north-west. Oral histories recount that people from this Reserve would travel through Crown reserves and ‘friendly’ landowners’ properties along Jack’s Creek to go fishing and collect bush tucker down by the river. Certain individuals within the community have revealed that they once worked on rural properties within this region. So post-contact Aboriginal settlement patterns were somewhat structured by core settlements such as fringe camps and Reserves and surrounding areas were used in structured ways, depending on access.
Although many of the core settlements and living places are to be found in areas to the north of this region, it is still expected that many post-contact places remain unrecorded here, as this northern area presumably served as a ‘backyard zone’ for the local Aboriginal population. The oral history and cultural mapping conducted during the course of this study has confirmed this to be the case. However, limitations on access through private property restrict our ability to confirm exactly where the places (and surviving traces) are located on the ground. The wider regional study has, nevertheless, provided some indication of the likely character of these places within this localised region. Many of them are associated with wild resource use dating back to the 1930s. Places relating to past employment, including work camps, are presumably less represented owing to the changing land-use history of this region.

Significance

As in many regions throughout NSW, there is much evidence demonstrating that people still actively engaged with the landscape in a variety of ways since colonisation. Core areas such as river floodplains remained important areas of activity and even of ‘escape’ from institutions trying to control and mitigate their lives. Water reserves, road reserves, and travelling stock routes acted as ‘openings’ that Aboriginal people used for moving through the privately owned agricultural landscape (Byrne and Nugent 2004). Such areas remain largely undeveloped and often functioned as important settlement and travelling routes for Aboriginal people in the past and have high social significance among many community members today.

Protection and management

It is recommended that impacts to the travelling stock route that passes through this region, and also any ‘corridor’ of bushland between rural properties be minimised, given their high potential for the presence of historical heritage places. More detailed oral history and cultural mapping within this region should be instigated to identify the array of places likely to exist outside the ‘core’ of Aboriginal historical settlements further to the north.

Management of the wild resource-use landscape

A total of 51 places have been linked to this theme in the region and it is estimated that over 10,000 additional places exist. Recorded archaeological sites in this region indicate occupation and usage of an area rich in natural resources. Oral history provides evidence of recent use of specific areas in this region as a meeting place for families on camping and food gathering trips. Remnant vegetation sites in the region contain indigenous plants used as sources of food, tools and medicine. The southern sector of this region is expected to have a high potential for the occurrence of past wild resource use places, given the large area of remnant native vegetation and regional oral histories documenting the use of this area in the past.

Significance

Given the detailed oral histories documenting the use of Jack’s Creek as a pathway to the river to collect bush tucker, it is expected that the variety of potential cultural plants in this vicinity has important value to the local community. Catchments are often characterised by their biodiversity and remain important areas for the conservation of Australia’s native plants and animals in the face of massive landscape changes (including clearing for agriculture). Aboriginal
use of riverine corridors is well documented in both prehistoric and historic times, as mentioned above. In a contemporary context, many Aboriginal people and communities still visit areas containing a number of important wild resource use places. Additionally, communities repeatedly express their desire to have the river systems and associated natural areas cleaned up and there remains a strong concern to gain, or maintain, access to ‘country’ for cultural practices.

**Protection and management**

Many management decisions made to conserve natural heritage values could easily have the dual value of conserving wild resource use heritage within this region. For instance, areas of remnant native vegetation would be expected to have a high level of association with wild resource use. Recommendations for possible ways to actively engage Aboriginal communities in the protection and use of their cultural heritage should be formulated for the region. As shown in Table 3, only 15 percent of the known places linked to the wild resource-use theme are found within National Parks lands, so there is a real danger that many places will be lost to development and clearing if this is not managed properly. Native plant replanting is an option in certain areas, and would also encourage and increase native fauna.

**Management of the social and spiritual landscape**

**Manifestation**

This theme includes a number of specific places (repeatedly) identified as important to the community’s identity, as well as places of strong community attachment. This theme is also manifest at the landscape level by the major pathways and travelling routes identified by the community during cultural mapping exercises. These tracks and pathways quite often link a number of important historical and resource-use places, and sometimes pre-contact archaeological places. Consultation with certain individuals has revealed that certain pathways follow tracks of spirit ancestors (‘Dreaming tracks’). Additionally, certain pathways identified were used for many years as a way of ‘navigating’ through a landscape that became increasingly built-up with private landholdings. These pathways also extend into neighbouring regions and were used to maintain social relations with other groups.

**Representation**

This theme is represented by a number of specific places and areas identified as being of major significance to the community. These include some natural landscape features. Certain (major) pathways that follow natural features (including rivers, swamps, and ridge lines) are also represented. Some of these pathways coincide with early European travel routes. Overall, the (actively-in-use) social landscape is represented as discontinuous parcels of land representing narrow access corridors through a regional town and rural landscape. The discontinuous nature of the social landscape is a concern amongst many individuals within the community.

**Significance**

The region is significant as a network of places used for social, ceremonial and other purposes in what is now a largely rural landscape. Cultural mapping has revealed a continuous history of use and tradition. A central theme is associated with travelling routes to important places. Some of these pathways are important for their links with ancestral systems (Dreaming tracks). Others are significant as historical pathways that represent (among other things) evidence of ‘cultural survival’ in an era of dispossession and oppression.

**Protection and management**

Where possible, pathways and travelling routes should be protected from disturbance. Such routes often follow natural features in the landscapes such as rivers and ridges, and can be incorporated into conservation plans associated with natural heritage. Places of social significance, including ceremonial, Dreaming and other story places, are commonly associated with waterways. Dreaming places may be represented by such natural phenomena as a bend in a river or creek, a lake, swamp, waterhole, hill or trees. Rivers and creeks themselves often represent pathways created by Dreamtime ancestors. It is recommended that efforts be made to maintain the water quality of the waterways in this region and provide for community access to such
natural corridors. Other natural features, such as prominent hills, should remain vegetated and if possible linked to the waterways through the establishment of a natural vegetation corridor, given the benefits of having interconnected parcels of country accessible to the Aboriginal community.

**Example of a conservation plan**

The above process assists in the formulation of management and protective measures for this hypothetical region, and guides any subsequent project-specific investigation. To illustrate how the type of characterisation outlined above can be integrated into regional planning, we contrast Figures 22 and 23.

Figure 22 is a map showing a typical process of regional development that has negatively affected much of the heritage landscape (through destruction of archaeological places, post-contact places, and spiritual places). It also demonstrates how Aboriginal people have lost access to much of their country, having access to only a few discontinuous parcels of land on which to continue cultural practice. Figure 23 is a generalised model of a potential development plan incorporating a regional conservation strategy. In this diagram, the conservation corridor and open spaces link together different areas of the physical and heritage landscape. This provides for a more holistic and integrated conservation plan. It also demonstrates how some of the problems and negative consequences of development, as depicted in Figure 22, can be overcome by showing some foresight in regional planning. A regional conservation strategy can be developed only upon a regional cultural heritage assessment (that is, by completing Components 1 to 4).

Figure 23 demonstrates how the strategic placement of open space areas within the more heavily built-up areas can assist in the conservation of important heritage areas. This may apply in areas characterised by a high

---

Section 2: Components
density and range of cultural heritage values or with a number of landforms that would assist in conserving a representative sample of heritage places. Different land-planning recommendations can also be formulated. For instance, large lot zoning (with large minimum lot sizes, such as one, five, or ten acres per dwelling unit) may be replaced by cluster zoning. Cluster zoning concentrates units together in smaller lots on a portion of the property (while maintaining the overall density of traditional zoning). In this way, there is more flexibility in design suitable for the protection needs of a network of Aboriginal places through the strategic incorporation of common open space.

Additionally, conservation corridors such as those depicted in Figure 23 are important strategies for a regional conservation plan. This is because such corridors provide links between places and different areas and may also protect specific types of Aboriginal pathways, such as Dreaming tracks or heritage associated with travelling stock routes. Different recording and management strategies are often required that specifically relate to linear features in the landscape (see Case Study 11). To incorporate linear pathways into planning, thoughtful development plans are needed: e.g., conservation corridors at the regional level or the installation of a bridge over (or tunnel underneath) an important pathway at the local level. These are often feasible solutions for protection.

Summary of Component 4

With this component of a regional study completed, we have specific recommendations available to feed into the planning process. We can also identify where further mapping work or field survey, or more fine-grained results, are required. In any study, one must also allow for the incorporation of new data or information that will become available in future, as well as for changing or evolving values. Thus, ongoing research and regional case studies are important mechanisms for refining methodologies of holistic cultural heritage assessment, especially in terms of how it relates to the planning process. Case Study 11 describes the concept of integrated cultural heritage management.

Case Study 11. Integrated management

A regional study is ultimately about protecting landscapes. In this regard, there is often a great deal of overlap between natural and cultural heritage management. The Willandra Lakes region in far western New South Wales, which includes Lake Mungo National Park, is an excellent example of a cultural heritage landscape requiring an integrated conservation plan. It is a region of highly significant scientific potential for both the natural and archaeological heritage, as well as contemporary social significance for local Aboriginal communities. Many of the problems affecting the cultural heritage of this region are the same problems affecting the natural heritage (e.g., overgrazing leading to erosion of the landscape and embedded cultural heritage places). The following information is taken from the Lake Mungo National Park Draft Management Plan ( NSW NPWS 2004).

The Region (NSW NPWS 2004, p. 12)

Mungo National Park and the surrounding Willandra Lakes Region are of international significance for both natural and cultural values. In respect of this outstanding natural heritage, it is the area’s record of climate and...
landscape evolution during the Pleistocene and Holocene that make it unique. The Mungo landscape reads like an open page of the past two million years; it is a geomorphological record unparalleled in Australia.

The park lies within the Lower Murray-Darling Basin, a landscape of little relief a mere 60 to 100 metres above sea level. The underlying Tertiary sediments of sand and mud that were washed down from the south-eastern highlands are overlain by aeolian Pleistocene deposits. As the rivers draining the eastern highlands, the Murray, Murrumbidgee and Lachlan, changed their course in response to fluctuating flows and shifting sand dunes, the Willandra Creek, a tributary of the Lachlan, was blocked and the Willandra Lakes System formed about 400,000 years ago. The lakes underwent a sequence of fluctuating water levels and the prevailing westerly winds steadily built lunettes on the eastern shores of the lakes. These fluctuations in flows and lake levels were brought about by climatic changes, including periodic glacial fluctuations in the south-eastern highlands.

Social significance of Lake Mungo (NSW NPWS 2004, pp. 14–16)

Nguyampaa tribe. The Nguyampaa people today still have association with the Willandra region and Mungo National Park. Their association comes through the Willandra Creek, that is through their southern boundary, where they meet up with the Mutthi Mutthi Peoples. This is our tribal boundary. Willandra Creek was and still is one of the main traditional water supplies that come through Nguyampaa country, this is where we connect to the Willandra and Mungo National Park. Our ancestors would have travelled down the creek, around the lakes and met other tribes and had ceremonies and trade around the lakes (Roy Kennedy – Nguyampaa Tribal Elder, Hay).

Mutthi Mutthi tribe. Mungo is the dreaming place for the Mutthi Mutthi people. It is where our people come to hold ceremonies. Mungo is a place of love, peace and harmony for the Mutthi Mutthi people. It is also the meeting place of the Tribes, where we held meetings, ceremonies and traded things. The Mutthi Mutthi had a long association with the Willandra Lakes and Mungo long before the white settlers came through this country. The dreaming lines of the Mutthi Mutthi are still there today; and so are those of the other tribes associated with that place today. Mungo is the most ‘cultured’ place as it reflects the past of the people and the land, it is a place that requires respect. It is the creation place where all things were brought into being. We realise today that this is the place where people and the land become one, where our people walk with the spirits of our ancestors.

Today we look at this place and we belong. It is a place where all our concerns and worries disappear—it has that effect on people. It is our most sacred site and demands respect. The future of the Willandra Lakes and Mungo National Park relies upon good management and respect of all those people that have an association with it. ‘The children and students must come to Mungo to learn and enjoy the spiritual and cultural significance of this, our most important place of our people, as this is the place of love, peace and harmony’ (Alice Kelly, Mutthi Mutthi Tribal Elder, Balranald).

Southern Paakantyi. ‘There was a little bunyip sitting on a log partly in the water and this wiimpatya came along and took him. Another wiimpatya said to leave him there and not to take him, but the first one he took him anyway. This old frog, he lived down a hole and sucked all the water in as punishment for taking the bunyip. These two wiimpatya, they wanted a drink. The bossy one said to the frog ‘give us some water or I’ll spear you.’ The other one said not to, it was better to wait, but the first one speared the frog and all the water started to come up. As more and more water came up the water got deeper and deeper. The two fellows started running but the water got too deep to run through, the first wiimpatya dropped the bunyip. The water kept rising and it flooded the country and the two fellows had to start swimming and they turned into two black swans.’

‘This was one story my mother would tell me when I was a child. It had a lesson in it, like all the stories. This lesson was not to kill things, unless it was for food. Some things we couldn’t kill even for food as they were our ancestors, our totem (Lottie Williams – Paakantyi Tribal elder, Pooncarie).

Archaeological values (NSW NPWS 2004, pp.14–15)

The global significance of the cultural heritage values of the Willandra region qualified the area for World Heritage status. The Aboriginal prehistory within the region is possibly the most significant in Australia. Ongoing associations with the land are of great importance to Paakantyi, Mutthi Mutthi and Nguyampaa people of today. Much has been written on the Aboriginal prehistory and archaeological significance of the region (refer to references at back of this plan). The following is a brief overview. Mungo National Park is part of an area that has one of the longest records of human occupation in Australia. The most abundant archaeological sites within the
park are stone artefact scatters and fireplaces. Some of these fireplaces had clay heat retainers and the evidence of the Mungo geomagnetic excursion of 28,000 – 31,000 years ago comes from these. Some of the fireplaces contain burnt fish bones and small middens containing shells of freshwater mussels have been found in the Mungo lunette. On the western shore of Lake Mungo just north of the homestead a silcrete quarry was the source of many of the stone artefacts scattered through the park, cores and flakes being most commonly found. It is known from burial sites just outside the park that Aboriginal occupation of the area extends beyond 40,000 years. These burials are also amongst the world’s oldest ritual burials and cremations.

The continuity of the archaeological record from 40,000 plus years ago to modern times, coupled with the evidence of landscape and natural resource evolution over that time, allow for an unprecedented comparison of Australian settlement and technology with that of other parts of the world. Evidence shows that social and economic developments in Australia occurred at a similar or earlier time than comparative developments elsewhere in the world. The shift from lacustrine resources to terrestrial resources as the climate changed and the lakes dried out is evident at Mungo National Park.

**Desired management outcomes (NSW NPWS 2004, pp. 16–17)**

- The presentation of Aboriginal culture will be overseen and directed by Paakantji, Mutthi Mutthi and Ngyiampaa people.
- All visitors to Mungo National Park will be made aware of the significance of the area, both in its prehistory and modern era context.
- The three Traditional Tribal Groups (3TTGs) will develop an increased capacity to meet management, educational and interpretive demands, which will increase with growing visitation to the park.
- Archaeological and Aboriginal cultural material will be protected from damage and inappropriate use/presentation.

**Strategies and actions (NSW NPWS 2004, p. 17)**

- The NPWS will assist the 3TTGs in promoting and presenting the Aboriginal cultural heritage values of the area in accordance with their wishes and in their words.
- The NPWS will assist the 3TTGs in collating an inventory of Aboriginal knowledge of flora and fauna.
- The NPWS will assist with developing the capacity of the 3TTGs to present, promote and protect the area’s cultural values. Specific activities will include the Discovery programs, interpretation training and working in partnerships with commercial tour operators.

**Overlap between cultural and natural heritage management**

- An inventory of Aboriginal knowledge of vegetation communities will be undertaken to identify and record native plant food and medicinal resources (NSW NPWS 2004, p. 22).
- Aboriginal knowledge of the fauna of the region will be collated and information from members of the three traditional tribal groups will be sought to gain a better understanding of the park’s wildlife (NSW NPWS 2004, p. 24).
- Research into the changing natural environment and the relationship to human land use will be encouraged (NSW NPWS 2004, p. 10).
- Biodiversity values are indivisible from Aboriginal cultural heritage values and traditional tribal groups will have an important role to play in relation to surveys and management directions (NSW NPWS 2004, p. 10).
Component 5: Information handling & reporting

In this component we look at the expected outcomes of regional studies for the major stakeholders, as a way of ensuring that the full benefits of regional studies will be realised when such studies are commissioned.

First, however, some considerations for information handling are discussed because these need to be understood before any ‘outcome’ can be achieved.

Information handling

To ensure the regional study process runs smoothly, Aboriginal communities should provide guidance as to the appropriate method for documenting, reporting, and handling of cultural heritage information. Aboriginal peoples’ knowledge of their cultural heritage places and pathways, resource use, and customs and spirituality lies at the core of a community’s identity and vibrancy. The process of collecting and presenting this information, therefore, needs to be done with respect and sensitivity.

Henderson et al. (2002, p. 483) provide guidelines for information control and reporting when working with Aboriginal communities in Victoria. These guidelines could be applied in any region of Australia:

The use and control of the data should be negotiated and agreed upon at the outset (Component 1). Aboriginal communities have the right to own data collected concerning their community and heritage. The community has the right to control the use of any data collected and how and where they are reported. All the information that is gathered, including research, photographs, interviews, and maps, remains the property of the Aboriginal community(s) unless another agreement has been established with the researcher(s). Any report must acknowledge the participation and assistance of the community in formulating the direction of the study. Consent to print and/or publish the report must be obtained from the community. The return or storage of the information that is collected should also be negotiated and agreed upon from the outset (Henderson et al. 2002).

Sensitive information

Cultural or traditional information must be accommodated with respect and sensitivity. This issue is summarised by English et al (1998, p. 187):

For many Aboriginal people past experiences with researchers has shown that the sharing of their cultural knowledge ostensibly means a loss of ownership of that knowledge, as it is often used without permission. Additionally, there is quite often a lack of understanding for the proper inclusion of information in publications, for interpretive purposes, in postgraduate work, or for inclusion in Aboriginal heritage registers.

The control of cultural knowledge is fundamental to Aboriginal identity and custom. Certain places are likely to have associated information of a confidential or sensitive nature. In a regional study, it is expected that culturally sensitive information about a place will not be divulged. Aboriginal consultants may not be explicit about why a site or place holds significance. Rather, the significance of the place is communicated through their mode of speaking. Often, it will be expressed through recommendations or misgivings about the nature of development in the vicinity of place. An Aboriginal consultant, for example, might convey the importance of a bend in a creek by repeatedly suggesting the proposed development is ‘too close’ without going into any specifics about the social importance/significance of the place. Here the researcher is aware of the importance of...
have been, and in fact remain, very complex. The maps show none of the detail or complexity and run the risk of suggesting that relationships were only with the particular, mapped areas.

**Reporting**

A community-level report should also be completed in tandem with a public report, with the latter not revealing any sensitive information. Purcell (2002a, p. 17) describes how this separation of reports worked for the Brigalow Belt Bioregion study:

> A descriptive overview of the landforms associated with the Bioregion and their potential cultural sensitivity, based on sites, is provided in this report to assist in regional planning bodies in conservation planning. Interested parties wishing to access information gathered during the assessment will be required to consult with the relevant LALC (Local Aboriginal Land Council). This approach provides Aboriginal people with more control of cultural heritage information. Control of cultural heritage information has been a strong desire of Aboriginal communities throughout the BBSB Bioregion.

This approach was used successfully in the Coffs Harbour regional Aboriginal heritage study:

> Undertakings were therefore given that each group would have complete control over their information and be consulted each step of the way about how information collected was being used. It was also agreed that the information collected would be collated and returned to the group at the end of the project. The acknowledgment of, and respect for, the authority of knowledge holders and the basis of their claim for controlling how their knowledge is used was of fundamental importance in setting the project off on a sound footing (Goulding 2001, p. 17).

To summarise, this component has not outlined a specific method for information handling and control; rather, it has raised the issues that need to be considered and worked out during the course of a regional study:

> Intellectual property and control are issues of considerable concern in indigenous communities… Negotiating appropriate ways to record, store and mange Aboriginal spatial information is a large and evolving task…(Adams 2001, p. 49).

**Mapping**

Mapping is a central component of a regional study. There are ways of ensuring that culturally sensitive information remains confidential while still releasing information in a format to assist in the planning process. A common approach is to provide a map for the community that displays all recorded information, and another map for planners showing less detailed cultural information (without any site-specific locations). In other words, ‘maps are produced at a scale which makes accurate spatial identification difficult’ (Adams 2001, p. 49).

One issue to note here is that maps derived from consultation with the community are ‘continuously redefined or renegotiated, both with respect to country and to phenomena which create significance’ (Adams 2001, p. 49). This issue not only emphasises the importance of ongoing consultation and refinement of regional studies, but also ensures that those who use the maps for specific purposes understand that they serve only to convey the overall context of Aboriginal cultural heritage in the region. Adams (2001, p. 49) summarises this issue in a cultural heritage assessment of the Illawarra region:

> In this report there are maps showing the conjunction between particular vegetation communities and Aboriginal middens, to indicate very broadly some landscape relationships between Aboriginal resource areas and past living areas. Actual understandings and use of these landscapes and resources are likely to...
Commissioning

a regional study

Section 3: Study commissioning
Commissioning an ‘outcome-focused’ regional study

The main component of this section is a model brief, that serves to summarise what is expected when a regional study is being commissioned, following the main considerations outlined throughout this report.

Land managers have sometimes taken the view that a regional study report is an outcome in itself. Many regional studies have been completed without any clarification of why the assessment was undertaken in the first place—as if simply funding and completing the study is all that is required for satisfying cultural heritage obligations in land management. This has resulted in a number of regional studies being left on the bookshelf. It is important, then, to think carefully at the outset stage about the way such a study will be used in the management context.

This section is about ensuring that all components of a study provide positive outcomes across the full spectrum of land management plans. We begin, in the next section, with a summary of the most common positive outcomes that a regional study can provide to the major stakeholders. The subsequent section is a model brief that overviews the basic requirements for commissioning a regional study, explaining how each component of a regional study is beneficial to management plans.

Expected outcomes of a regional study

The outcome of a regional study is different for different people or organisations. For Aboriginal people and communities, a regional study provides the opportunity to become involved in all facets of conservation management and planning, including more appropriate forms of consultation: something that has been demanded by communities for a long time. For practitioners, a regional study provides structure to the research, data analysis and assessment for any Aboriginal Heritage Impact Assessment or research project. For land managers, a regional study provides a more effective, perhaps cost-effective, tool for integrating cultural heritage issues into existing instruments. The following addresses the question of what a regional studies can provide for different stakeholders

Benefits for Aboriginal communities

✓ Provides communities with the opportunity to become involved in all facets of land management and planning, a common demand of Aboriginal people for many years.
✓ Provides for consideration of all elements of cultural heritage places and their associated values, meaning that the management system becomes much more relevant to Aboriginal people.
✓ Provides opportunities for communities to engage with ‘country’, both during and after a regional study.
✓ Provides opportunities for communities to ‘restore connections’ to land and/or places that have been lost due to years of restricted access to traditional lands.
✓ Opportunities for involvement in strategic cultural heritage management enhance the community’s identity and cultural confidence.

By recognising, in advance, the potential for these positive outcomes, a regional study can be commissioned in a way that maximises this potential. The next main section suggests a model brief for ensuring that an integrated, holistic regional study is commissioned in the first place.

Benefits for park or reserve managers and field staff

✓ Provides input to park Plans of Management and guidance to park managers in identifying areas of significance for Aboriginal cultural heritage and the potential implications of park management activities on this heritage.
✓ Provides context for the regulation of Aboriginal objects.
✓ Provides the basis for the identification of Aboriginal places in parks.
✓ Provides the basis for consideration of Schedule 14 handback processes (by identifying the Aboriginal cultural heritage values of the nominated reserves).
✓ Provides input to Indigenous Land Use Agreements.
Provides input for interpreting Aboriginal cultural heritage sites.

Provides the foundation for ongoing consultation between local nation park managers and Aboriginal communities and for improving staff awareness of Aboriginal cultural heritage.

Facilitates the implementation of DEC’s Aboriginal cultural practices policies.

Provides the basis for ongoing site monitoring.

Benefits for land management authorities

Provides input to community-based conservation and management plans.

Provides context for identifying areas where natural and cultural heritage values overlap.

Helps coordinate a streamlined process of Aboriginal consultation and involvement in land management.

Provides a cost-effective form of consultation and integration of cultural heritage into planning and management (by anticipating issues and concerns). Note that it is difficult to mitigate or amend any development plan or proposal when the cultural heritage regional context remains largely unknown or patchy.

Assists in development of more strategic management plans. There is a common misconception that knowing the exact location of ‘sites’ is the best way to adhere to cultural heritage compliance laws. This has led to ‘site avoidance’ as an effective planning strategy. This is a very short-term solution—it simply postpones and complicates effective decision-making.

Benefits for cultural heritage practitioners

Facilitates the development of research designs

Provides a thorough background for any local study relating to EIAs, including the process of Aboriginal consultation, environmental–human relationships, and history of past and present land use.

Provides a good context for preparing significance assessments of individual places or areas.

Ensures that future work or studies can be fed back into the regional context to refine or substantiate aspects of the regional model, and so overcome the problems of a growing body of ‘grey’ literature in the field.

A model brief

The following is a model brief that may serve as a guide for those commissioning regional studies.

The hypothetical project

A land management authority (LMA) is commissioning a regional study to deliver a model for sustainable land-use planning across the region. This will be a scoping study for integrating natural and cultural heritage into the existing land planning framework.

Major outcome

The major outcome is a summary of the integrated cultural heritage landscape from a regional management perspective. The project shall demonstrate how the regional study can guide project-specific assessments (e.g., archaeological surveys of areas of proposed land development). It will also identify broad spatial patterning in the cultural heritage landscape, and isolate areas needing further investigation.

Project objectives

• To identify and engage with Aboriginal communities within the region and establish a cooperative regional cultural heritage assessment consultation framework.

• To characterise, map, and model the spatial distribution of Aboriginal cultural heritage places throughout the region.

• The key deliverable will be a report with accompanying maps and tables that identifies the extent of cultural heritage places and community knowledge that currently exists (or is likely to exist) throughout the region. This report will also identify and describe the data/knowledge gaps that exist within the region.

Deliverables

To meet the project objectives, the consultant is required to complete five stages that may or may not overlap. They are:
1. A comprehensive Aboriginal community consultation process
2. Documentary research and cultural mapping
3. Landform mapping and predictive modelling
4. Recommendations for land planning and management
5. An integrated final report outlining the methods used and results of each stage.

Each stage will be completed as a separate report that delivers outcomes as follows:

**Stage 1 Deliverables:**
- A list of all the individuals and communities that were consulted about the project
- A report detailing the input of individuals and communities
- A report on how the information gathered will be reported back to the community

**Stage 2 Deliverables:**
- A list of all the currently identified places existing in the region
- A list of places and pathways likely to exist in the region (but that are presently unrecorded) as determined by a comprehensive review of records such as heritage reports, history books, and archival records
- A list of places and pathways that the Aboriginal communities and individuals want to be considered in the cultural mapping project
- A background description of the environment and history (pre-contact and post-contact) of the study region.

**Stage 3 Deliverables:**
- A landform map showing the density of places known to exist on the ground throughout the region
- A predictive map showing where places and pathways (presently unrecorded) are likely to exist on the ground throughout the region
- An explanation of how the patterns revealed in these maps and models relate to the environment, prehistory, history, and changing patterns of land use/land tenure in the region

**Stage 4 Deliverables:**
- A report outlining specific planning and management recommendations at the regional level. This includes a report on how the maps and models generated in Stage 3 might be included in land planning and management.

**Stage 5 Deliverables:**
- A summary report that integrates the heritage professional’s findings and the outcomes of community consultation.

**Minimum methodological requirements and procedures**

**Stage 1 Procedures**
- Conduct a preliminary round of consultation meetings with LALCs, Elders Groups and other relevant Aboriginal people with an interest in the study area
- Produce letters, fliers, and newsletters that introduce the project team, describe the nature and purpose of the project, and provide regular updates on the progress of the project
- Memorandum of agreement that makes clear how the information collected will be used and presented
- Arrange a second round of consultation meetings approximately at the half-way stage of the project and a final community meeting at the completion of the project (the latter to include the submission of a community report).

**Stage 2 Procedures**
- A review of the relevant Aboriginal sites registers, environmental impact assessment reports, and research projects to provide a list of all currently identified/recorded archaeological sites in the region, the list to be organised into site types and/or time periods
- Conduct a targeted archaeological field survey to overcome specific data gaps that exist for the region
- Review the documentary historical evidence to identify places with historical associations, wild resource-use places, and other places of social and spiritual significance. This will include
a review of collections of local historical societies, library collections, archival collections including the records of the Aborigines' Protection Board and the Aborigines' Welfare Board, and other government and municipal records and historical maps. It is unlikely that in the time available the consultant will be able to search all repositories of documentary evidence relating to Aboriginal historic period settlements. The consultant will be called upon to use their professional judgement and experience in deciding how best to distribute their time and effort across the range of historical sources available. The guiding rule for this will be a 'top down' approach in which priority is to be given to those sources most easily accessible and/or most likely to contain the information desired. The consultant will also be required to attempt a reasonably even geographic coverage of the study area.

- A cultural mapping exercise in which field excursions are conducted with Aboriginal people to record (on the ground) the places and pathways they would like to have considered in the regional assessment. As an alternative to field excursions, people may be able to pinpoint relevant places on aerial photographs. The methods used in the cultural mapping exercise and a list of people who were involved should be included in the report.

- Listing and description of the major historical and community themes that have come out of the documentary research and cultural mapping. All identified places and pathways should be grouped into at least one of these themes.

**Stage 3 Procedures**

- Production of a map of the study area that divides it into the major landforms identified via a landform mapping exercise and/or the use of existing landform data from land management agencies.

- Overlaying of the landform map with the list of known cultural heritage places and pathways. This list is to be categorised into: archaeological places and pathways, historical places and pathways, wild resource-use places and pathways, and social and spiritual places and pathways.

- Describe and discuss how the patterns observed (from the above point) relate to:
  - the natural environment
  - biases arising from data/knowledge gaps
  - the prehistoric/historical record
  - land tenure
  - changing access to land.

- Develop and present an archaeological predictive model by matching the environmental data against the distribution of known/recorded archaeological sites. Interpret this model and identify its limitations.

- Use a thematic model to describe the spatial character and distribution of historical places, wild resource use places and social/spiritual places throughout the region. Provide a list of predictive statements regarding the likely spatial character of different areas within the region.

- Map the spatial character of each identified theme and map the predicted spatial character (or ‘footprint’) of each theme within different areas within the region.

**Stage 4 Procedures**

- Group all the identified places and pathways by land tenure, calculate the percentage that exist within existing conservation areas and estimate the total number of places likely to exist across the entire region.

- Describe how each place type and/or theme is over- or under-represented in certain areas.

- Use a filtering model to estimate what proportion of the total (estimated) number of each site type and theme has been lost by land clearing and other developments.

- Describe how each place type and theme is manifest in the region, how well represented it is, the potential realms of its significance, and specific planning and management recommendations appropriate to it. At the broadest scale, these should be organised as archaeological places, historical places, wild resource-use places, and social/spiritual places.

- Prepare a map that suggests possible land planning solutions that would maximise
the conservation of the variety of places and pathways in the region.

**Stage 5 Procedures**

- Ensure all cultural heritage information that has been recorded in the course of the project has been properly registered with relevant heritage organisations and/or delivered to the community in agreed format.
- Submit an integrated professional report that links each stage of the project, describes the methods and results and addresses any limitations or problems relating to specific components of the assessment. Any sensitive information should be excluded.
- Submit a community report that is written in plain English and clearly explains the project’s outcomes.

**Consultant’s submission**

The following is a list of information that should be submitted by the consultant as part of their tender for the project:

- Name and contact details for key personnel
- Description of the consultant’s expertise in the required area, including a list of similar consultancies undertaken in the last 5 years together with client contact information
- A list of personnel (including any subcontracted personnel) to be used in the consultancy together with their curricula vitae and proposed contribution to the consultancy
- A brief outline of the consultant’s understanding of the task, addressing the selection criteria
- An outline of the methods and processes to be used, based on the tasks identified in the Brief
- The consultant’s fee estimate, including both an hourly rate and a quantum of hours per person
- Proof of appropriate insurance for public liability, personal illness and injury insurance and professional Indemnity Insurance

Tenders should be concise and relevant to the aims and requirements of the consultancy, as specified in the project brief. However, prospective consultants should not be discouraged from making alternative suggestions in their proposals, either in terms of the technical content of the work, or in terms of arrangements for consultancy. Any such variations from the brief must be clearly identified as such.

**Schedule**

Stage 1 should take approximately 10 per cent of the total budgeted time with at least 5 per cent at the beginning and 5 per cent throughout the course of the project (e.g., 1 month of 10 months)

Stage 2 should take about 30 per cent of the total budgeted time (e.g., 2.5 months of 10 months)

Stage 3 should take about 30 per cent of the total budgeted time (e.g., 2.5 months of 10 months)

Stage 4 should take about 10 per cent of the total budgeted time (e.g., 1 month of 10 months)

Stage 5 should take about 20 per cent of the total budgeted time (e.g., 2 months of 10 months)

**Payment schedule**

The following is a suggested as a possible breakdown of the fee:

- 5 per cent at the completion of the first round of Stage 1
- 5 per cent at the completion of the second round of Stage 1
- 25 per cent at the completion of Stage 2
- 25 per cent at the completion of Stage 3
- 5 per cent at the completion of Stage 4
- 35 per cent upon the submission of the final professional and community reports.

**Criteria for selection of consultant**

The following considerations are relevant in choosing a consultant to carry out a regional study:

- Appropriate professional qualifications. Minimum qualifications would normally be an undergraduate degree with honours in archaeology (for a consultant dealing with the archaeological components) or history (for a consultant dealing with the historical component). It may be possible to engage a consultant with qualifications in both fields.
• Experience in similar work at a regional scale
• Experience with working collaboratively with Aboriginal communities (including organising and facilitating community workshops)
• Sufficient experience in GIS to be able to do the mapping needed for the project or interpret and use GIS mapping done by a subconsultant with expertise in this field
• Experience in cultural heritage planning (requiring familiarity with relevant legislation and government planning processes).
• References to previous reports and publications.
Appendix A: Further reading

The numbers here refer to those that were placed in the text at various times, indicating that more information relating to the specific topic is available. Most of the following documents can be accessed online, and so the web links are provided.

1 Cultural heritage landscapes are defined as ‘areas that are illustrative of the evolution of human society and settlement over time, under the influence of physical constraints and/or opportunities presented by their natural environment and successive social, economic and cultural forces, both external and internal’ (Cotter M, Boyd W, Gardiner J eds 2001: Heritage Landscapes: Understanding Place and Communities, Lismore: Southern Cross University). To read more about the wider concept of ‘cultural landscapes’ see www.heritage.nsw.gov.au/docs/CLBackground9-03.pdf

2 For a brief overview of Aboriginal heritage (and cultural heritage in general), including the legislative frameworks, see the NSW Heritage Office publications:


A Guide to the Heritage System

Aboriginal History and Heritage: A Guide

3 Aboriginal places are valued for their aesthetic, historic, scientific, social, or spiritual value. Cultural heritage practitioners generally adopt the Burra Charter as a framework for evaluating the significance of a place. The Burra Charter was formulated by the Australian International Council on Monuments and Sites (ICOMOS). You can read more about Australian ICOMOS and the Burra Charter on the Internet:

http://www.icomos.org/australia/

Australia ICOMOS Guidelines to the Burra charter (1988): cultural significance

For a more thorough discussion of the concept of significance see Social Significance: a discussion paper (Byrne et al 2003). This publication is also available on the Internet via the following link:

Social Significance: a discussion paper (Byrne et al 2003)

4 For details of the legislation pertaining to Aboriginal cultural heritage see:


5 For a more detailed overview of wild resource use and the integration of natural and cultural heritage see the following:


Caring for country and sustainable Indigenous development

The sea and the rock gives us a feed

Indigenous Kinship with the Natural World in NSW

In general, there is often a great deal of overlap between natural and cultural heritage, as Bennet (2000, p. 42) states: The similarities between natural and cultural heritage are strong. They frequently extend beyond features that are working in parallel to the situation where they are overlapping and almost inextricably linked. This may well prove advantageous to those concerned with policy making in the cultural heritage realm. Much of the developmental work that has been done on techniques to further the economic evaluation of proposals to protect natural heritage assets would appear to be readily adaptable to the case of cultural heritage assessment (Bennet 2000, p. 42).

6 Two excellent examples of this methodological process are:

Goobang National Park Cultural Heritage Assessment (English et al 1998, pp. 98–183)

Brigalow Belt South Bioregion (Stage 1 and 2) Aboriginal Cultural Heritage Assessment (Purcell 2002).

7 For information on the methods required for conducting an oral history project see:


Talk to Print

Talking History: Oral History Guidelines

8 For a discussion on the definition, value of, and methods involved in archaeological predictive modelling, see the following:

http://modelling.pictographics.com
Archaeological Predictive Modelling: The Basic Ideas
Cultural Resource Predictive Modelling
Methodological Considerations
Archaeological Predictive Modelling: An Assessment

9 For a more detailed example of the methods for documenting Aboriginal historical heritage see:
http://www.nationalparks.nsw.gov.au NPWS

Mapping Attachment

10 For more detailed information on the relationship between archaeologists and Aboriginal people and communities, see:

11 In gathering data (documentary research and cultural mapping) about a particular pathway, it is important to document any links between the traditional (or community) pathways and early roads and tracks used or built-up by explorers, early settlers, and governments. That is, the original physical context of the pathway is likely to have changed substantially, and the linear resource is likely to hold both Aboriginal and non-Aboriginal historical significance as a result. As such, the entire length of the existing pathway should be described or delineated, if possible, even if only a segment has been established to have clear community associations. This places the pathway into a broader historical context and so the pathway can then be assessed for its significance relative to the various themes that might apply. Furthermore, understanding the broader context and physical manifestations of the pathway, track, or road, provides for more flexibility in management, given that certain segments will be in better physical condition or have more clear community and/or historical associations. In other words, different segments are expected to be contributing (or not contributing) to the significance of the pathway, track, or road, as a whole, and will have different themes associated with it over its entire course.

12 To read about the unique historical experiences of a number of Aboriginal women throughout NSW, refer to the series:
http://www.nationalparks.nsw.gov.au NPWS

Aboriginal Women’s Heritage

13 Text and maps kindly provided by Dr. Patricia Fanning. For more detailed information on this project refer to the variety of published reports Dr. Fanning and her colleagues have produced at www.gse.mq.edu.au/Research/wnswap
Appendix B: General and environmental glossary

General glossary

1 Aboriginal: Comes from the Latin term ‘ab origine’ which means ‘from the beginning’ and refers to the original inhabitants of a particular place. In Australia, an Aboriginal person is someone who is of Aboriginal descent, identifies as an Aboriginal person and is accepted as an Aboriginal person by the community in which he or she lives (Human Rights and Equal Opportunity Commission 2003).

2 Aboriginal Ceremony and Dreaming: Spiritual/story places/landscapes where no physical evidence of previous use of the place may occur. Such places include natural landscape features, ceremonial locations, men’s/women’s places, creation stories and tracks, and birth, marriage and burial places (Brown 2005).

3 Aboriginal Resource and Gathering: Relates to places/landscapes where food gathering, hunting, or collection and manufacture of materials and goods for use or trade were undertaken. Wild resource places are those locations where people have obtained wild foods, medicines and materials in the historic past and during the current day (English 2002, p. 2).

4 Art: Visual images created on rock surfaces in rock shelters or on rock platforms. Includes images created using pigments (paintings, drawings and stencils) or engraved images created by pecking, pounding, abrasion and/or scratching (Brown 2005).

5 Artefacts: Objects such as stone artefacts (pieces used as tools as well as waste products) including fish-hook files, grindstones, ground-edge hatchets/axes and manuports; wood implements such as spears, boomerangs, clubs and shields; shell implements such as shell fish-hooks, ‘scrapers’ and shells hafted onto the end of spear-throwers; and glass, metal and ceramic artefacts made or used in the historic period (Brown 2005).

6 Assimilation policies: In 1937, the Commonwealth Government held a national conference on Aboriginal affairs that agreed that Aboriginal people ‘not of full blood’ should be absorbed or ‘assimilated’ into the wider population. The aim of assimilation was to make the ‘Aboriginal problem’ gradually disappear so that Aboriginal people would lose their identity in the wider community. Protection and assimilation policies that harshly affected Indigenous people included separate education for Aboriginal children, town curfews, alcohol bans, no social security, lower wages, State guardianship of all Aboriginal children and laws that segregated Indigenous people into separate living areas, mainly on special reserves outside towns or in remote areas. Another major feature of the assimilation policy was stepping up the forcible removal of Indigenous children from their families and their placement in white institutions or foster homes (Human Rights and Equal Opportunity Commission 2003).

7 B.P.: Before present. The ‘Present’ is defined as 1950 (Amorosi and Murphy 2000).

8 Burials: Location(s) where Aboriginal people were buried and/or where human remains have been found. Burials may be either pre- or post-contact in age and may occur in shell middens, in sandy soils, or in caves or in historic cemeteries, and they may or may not be marked by carved trees, stone arrangements or headstones (Brown 2005).

9 Caring for country: An Aboriginal term for the traditions derived from the individual and group identities attained from their own particular area of land and sea, often referred to as country. Throughout life Aboriginal people retain their cultural association with, and responsibilities to look after, their traditional country—even though they may no longer have ownership or even access to it. It is this sense of responsibility to country that makes indigenous groups particularly keen to be involved in the management of coastal areas (Western Australian Planning Commission 2004).

10 Ceremonial Ring: ‘Bora grounds’ comprise a single or double raised-earth circle with or without a connecting pathway. Usually places for male initiation ceremonies (Brown 2005).

11 Conflict: Confrontations occurred between Aboriginal and non-Aboriginal people, or between different Aboriginal groups (Brown 2005).
12 **Contact site**: Site relating to the period of first contact between Aboriginal and European people. These sites may be associated with conflict between Aborigines and settlers, or mission stations or reserves, or historic camping places. The artefact assemblage of contact sites will often include artefacts manufactured from glass (Amorosi and Murphy 2000).

13 **Earth mounds**: Raised earth platforms that functioned as cooking ovens, and plant processing and habitation sites associated with inland NSW and Victorian river systems. In AHIMS, commonly applied to mounded shell midden deposits (Brown 2005).

14 **Fish trap**: Constructed stone or brush weirs or walled enclosures designed to trap fish. May be situated on coastlines or along watercourses (Brown 2005).

15 **Grinding grooves**: Grooves formed by rubbing stone, wood or bone pieces on a rock surface during implement manufacture or re-sharpening. Also includes circular or oval shaped ground areas formed during food processing or powdering ochre (Brown 2005).

16 **Habitation structure**: Structure produced by, or for, Aboriginal people for short or long-term shelter. Includes structures, or remains of structures, at historic living places such as missions, reserves and fringe camps (Brown 2005).

17 **Hearth**: A fireplace or campsite, represented archaeologically by concentrations of charcoal, ash and/or hearth stones or discoloured/burnt earth or other materials such as heat-treated stone fragments (Brown 2005).

18 **Heritage place**: An area or region of land that represents a particular focus of past human activity, or that represents a concentration of in situ cultural material. A place includes any structures, buildings or works upon or integral with the land, and any artefacts or other physical relic associated with the land, or it may have no visible evidence of human activity, being rather the site of a past event of importance or the embodiment of a particular belief or legend. Examples might range from an Aboriginal ceremonial ground, a pioneer's house and contents, a shop, the remains of an early whaling station or a recent fish farm, Captain Cook's landing place, a 40 000-year-old Aboriginal campsite or a 1990s brick-veneer house, a shipwreck, an industrial or mining landscape, a bus stop, a Macassan trepanger campsite or the Surfer's Paradise Caravan Park, a garbage dump, the local war memorial, a garden, an Aboriginal rock painting or a band rotunda (Amorosi and Murphy 2000).

19 **Holocene**: The time from the end of the Pleistocene Ice Age (c 10 300 BP) to the present day (sometimes referred to the postglacial period) (Amorosi and Murphy 2000). Archaeologists generally divide the Holocene into three components. The Early Holocene relates to the period from the end of the last Ice Age (~12,000 years ago) to approximately 5,000 years ago. During this time there is early evidence for a change in technology and subsistence practice; the adaptation to new environments; and responses to climate change and rising sea associated with the end of the last Ice Age. Sub-themes correspond to those listed for the Pleistocene, with the expectation that each theme would have slight variation in the form and context of the sites that are linked to this theme. Middle Holocene: This theme relates to the period from approximately 5000 years ago to 2000 to 1500 years ago. During this time, there is evidence for the introduction of new stone working technologies, and outside influences such as the arrival of the Dingo. There is also evidence for the development of regional territories and more formalised trade and exchange networks. Sub-themes include those listed for the Pleistocene as well as regionalisation, colonisation of new environments, and trade/exchange. Late Holocene relates to the period from 2000 to 1500 years ago to the time of European invasion. During this time, there is evidence for new or more intensive subsistence practices, large social gatherings, increased sedentism, and regionalisation. These are all sub-themes, in addition to those listed for the Pleistocene.

20 **Midden**: A term borrowed from the Danish. It originally applied to the accumulations of shell and other food remains left by Mesolithic man in that country. Australian Midden sites are accumulations of hearth and food debris that has built up a deposit on the ground surface over a length of time. Middens are generally comprised of charcoal and either freshwater or coastal shell species, depending on the site's location. Midden sites may also contain stone artefacts, and the
food refuse of other native animals such as small mammals. Their thick deposit of burnt shells and dark grey/black deposit can distinguish midden sites within the landscape. Coastal shell middens are often found in close association with rock platforms. Freshwater shell middens are found in close proximity to areas that provided freshwater mussels (Amorosi and Murphy 2000).

21 Modified tree sites: Locations where either carved or scarred trees occur or where known to have occurred. Trees into which designs were carved are usually associated with burials, ceremonial grounds or territorial markers. Scarred trees have a scar(s) where a section of bark or wood was removed in order to make a canoe, shield or container, or where foot-holds were cut into the tree trunk to gain access to resources such as possums or honey (Brown 2005).

22 Non-human bone and organic material: Objects most commonly found within Aboriginal archaeological deposits including bone tools, faunal remains (such as fish, bird or mammal bones), and plant remains (resin, twine and plant food). Also includes fishing lines and nets, net bags, and ornaments such as armbands, belts, necklaces and pendants (Brown 2005).

23 Ochre quarry: Source of earth used as a pigment for art (drawing, painting or stencilling images on rock surfaces, as well as for decorating bodies, tools and weapons), for ceremonial occasions, burials and trade. Usually comprise clays coloured by red, brown and yellow iron oxides or white clay pigments (Brown 2005).

24 Pleistocene: The geological period corresponding with the last or Great Ice Age. The onset of the Pleistocene is marked by an increasingly cold climate, by the appearance of Calabrian mollusca and Villafranchian fauna with elephant, ox, and horse species, and by changes in foraminifera. The oldest form of man had evolved by the Early Pleistocene, and in archaeological terms the cultures classed as Paleolithic all fall within this period. The date for the start of the Pleistocene is not well established, and estimates vary from 3.5 to 1.3 million years ago. The period ends with the final but gradual retreat of the ice sheets, which reached their present conditions around 10,300 BP (Amorosi and Murphy 2000). Archaeological research and the discovery of new sites continually refine our understanding of this broad period. It has been established that Aboriginal groups colonised and adapted to diverse Australian environments that underwent significant changes due to climate fluctuations. Sub-themes include colonisation of the continent, mobility, technology, settlement, subsistence, human morphology, ritual/ceremonial, and art.

25 Post-contact Aboriginal site: Also referred to as Historic Aboriginal Site. These area sites/places/localities indicate that contact has been made with European culture during the period of initial European settlement (glass in tool assemblage, massacre sites), or that activities culturally significant to Aboriginal people have occurred (camping, employment, travelling routes) (Amorosi and Murphy 2000).

26 Potential archaeological deposit: An area where surface artefacts may or may not have been identified and where sub-surface artefacts and/or other cultural materials are thought likely to occur (Brown 2005). On the basis of collated existing data and site inspection an area or specific site may have the potential for extant or archaeological deposits. Background research will present the most likely site types, contents and state of preservation. Relative levels of potential are described as Low (10 to 30 per cent probability), Moderate (40 to 60 per cent probability) and High (70 per cent and above probability) (Amorosi and Murphy 2000).

27 Protection policies: Indigenous survivors of frontier conflict were moved onto reserves or missions. From the end of the 19th Century, various State and Territory laws were put in place to control relations between Aboriginal people and other Australians. Under these laws, protectors, protection boards and native affairs departments segregated and controlled a large part of the Aboriginal population. It has been estimated that the Aboriginal population during the 1920s had fallen to only about 60,000 from perhaps 300,000 or even one million people in 1788 (Human Rights and Equal Opportunity Commission 2003). ‘The restrictions and controls placed on Aboriginal people living within the managed missions and reserve system affected life on a daily basis. Cultural practices, particularly language, were suppressed, behaviour was modified and movement on and off the settlements was controlled’ (Purcell 2002).
28 Rock shelter/cave: Sites that are located within a rock shelter/overhang or caves. The archaeological deposits within such sites can vary considerably but are often predominantly lithic. Depending on their location, the archaeological deposit may also include midden deposits of shellfish, fish or terrestrial fauna. Owing to the often undisturbed deposits at these sites, they are potentially very valuable sites and are generally considered of high scientific significance. There are instances where rock shelter sites also possess art work on the stone walls are considered as rock shelter/art site combined (Amorosi and Murphy 2002).

29 Shell sites: Places where shells from beach, estuarine or river species have accumulated as a result of Aboriginal gathering and food consumption. Shell middens vary in size from a few scattered shells to extensive shell deposits, which may include artefacts, hearths, animal bones, other organic material, ochre and burials (Brown 2005).

30 Sampling (archaeological): To ‘define’ Sampling in archaeology, we quote from Pardoe and Martin (2001) as presented in their report on the Murrumbidgee Province:

**Systematic sampling** involved the assessment of the distribution of sites in the Murrumbidgee Province from the NP&WS sites register. In order to ensure as complete a treatment as possible, areas with no registered sites were targeted. This approach was one of ‘filling in the gaps’. One aspect of this approach is that while it may seem counterproductive to examine areas where experience suggests there will be little material evidence, it is necessary to quantify that experience. Equally, there were areas that had no sites registered simply because no one had ever looked there.

**Stratified sampling** assumes prior knowledge of relevant factors likely to affect site distribution. Our selection of places to survey was influenced by landform, soils and water source within the existing blank spots of the sites register.

**Hierarchical sampling** involves sampling with increasing detail at a number of levels. In effect, once areas and associated features had been prioritised, it remained only to selectively narrow down sampling possibilities to particular properties and paddocks within them. This latter was done in discussion with local residents and formed part of the consultation process.

30 Stone arrangements: Humanly arranged stones or rocks, which form lines and circles as well as cairns and piles (heaps), sometimes in complex groups. Stone arrangements are associated with ceremonial activities, or used as markers for territorial limits or to mark/protect burials (Brown 2005).

31 Stone quarry: Location from where stone has been removed by Aboriginal people from a stone raw material source for use in the production of stone tools. Includes locations where pebbles or cobbles were obtained from gravel beds or eroded conglomerate sediments. Also termed ‘stone source’ or ‘extraction site’ (Brown 2005).

32 Terra nullius: From 1788, Australia was treated as a colony of settlement, not of conquest. Aboriginal land was taken over by British colonists on the premise that the land belonged to no one (‘terra nullius’). Australia’s colonisation resulted in a drastic decline in the Aboriginal population. Estimates of how many Indigenous people lived in Australia at the time of European settlement vary from 300 000 to one million. Estimates of the number of Indigenous people who died in frontier conflict also vary widely. While the exact number of Indigenous deaths is unknown, many Indigenous men, women and children died of introduced diseases to which they had no resistance such as smallpox, influenza and measles. Many also died in random killings, punitive expeditions and organised massacres (Human Rights and Equal Opportunity Commission 2003).

33 Visibility: Refers to the degree to which the surface of the ground can be observed at the time of an archaeological survey (Fanning & Holdaway 2004). This may be influenced by natural processes such as wind erosion or the character of the native vegetation, and by land-use practices such as ploughing or grading. It is generally expressed in terms of the percentage of the ground’s surface visible to an observer on foot. For example:10 per cent visibility equates to 10 cm² / 1 m² of ground surface that is not covered by vegetation or soil deposit. For example (Amorosi and Murphy 2000):
0% = No visible ground surface
0%–10% = Very Poor
0%–30% = Poor
30%–50% = Fair
50%–70% = Good
70%–90% = Very Good
90%–100% = Excellent

34 Waterhole: Natural or human-made cavities where fresh water could be obtained. Waterholes may have been sources of water for Aboriginal groups. They may have had ceremonial or dreaming significance and/or may also be used to the present day as a rich resource gathering area (e.g., waterbirds, eels, clays, reeds etc) (Brown 2005).

Environmental terms

Alluvial fan: A cone- or fan-shaped alluvial deposit; usually where a stream leaves a narrow valley and enters a broad plain. Generally steeper angled than alluvium. Often with traces of many abandoned channels on the surface.

Alluvial terrace: Abandoned floodplains of stream or rivers (abandoned because the stream has eroded its bed, and floodwaters can no longer reach the old floodplain). Usually a natural process, although gullying can have the same effects.

Alluvium: Deposited by streams or rivers. Mapped areas will usually surround a channel and include both the channel and the floodplain. Where the floodplain is too small to map, the creek lines may indicate small pockets of alluvium. Soils range from sand to clay, usually deep. Creek beds may erode top bedrock in some areas. Some alluvial areas have only poorly defined drainage lines or discontinuous channels (chains of ponds).

Bench: Flat or near flat area of rock on a plateau, often at the edge of the plateau, above a steep slope.

Claypan: Small, shallow, circular depression that intermittently holds water (from local runoff). Usually without trees, but sometimes with grasses. Circular shape suggests possible shaping of shoreline by wave action. Appears to form by deflation of the topsoil, exposing the impermeable subsoil that holds the water.

Colluvial slope: Deposit of slope processes, usually sheet (rather than channel) flow, accumulating on the lower slope, below a soil mantled or rocky slope. Slopes range from steep (>15 degrees) to very low (<1 degree). Colluvium slopes towards the creek line from the slope, distinguishing it from alluvium, which slopes down the valley parallel to the creek. Often has a deep coarse or medium (sand to loam) soil. Highly susceptible to erosion, especially where vegetation has been disturbed (such as by cultivation, forestry, road-building).

Ephemeral creeks (second and third order): Drainage lines that are unlikely to hold water after rain events or hold water only for a short period.

Floodplain: Broad area of alluvium around the major rivers and creeks. Key floodplain characteristics include channel size, permanence of water, in-channel features (bars, pools) and abundance of floodplain features such as flood channels, meander scrolls or Paleochannels. Generally fine-grained soils (clays to earths). Flat with poor drainage.

Floodplain features: Features such as former meanders and terraces that indicate that the morphology of the current creek was different in the past.

Flood channel: Discontinuous channels on the floodplain formed by scouring when floodwaters leave the main channel. Flood channels often hold water for extended periods after floods, thereby forming waterholes.

Footslope: Slope element adjacent to and above a floodplain/flat.

Gilgai: Area of deep, black cracking clay where the surface has a pattern of mounds and hollows (formed by expansion and contraction of the clays as they wet and dry). The hollows often gather water after rain and can hold it for some time.

Mid slope: Slope element not adjacent to a crest or flat.

Overland flow: Water runoff across the unchannelled surfaces of hillslopes and floodplains. May transport leaf litter and mineral sediments, as indicated by deposits of litter dams and microterraces left on the surface when the flow subsides.
**Paleochannel:** An old channel (abandoned). Usually as the result of natural processes and the creation of new channels elsewhere on the floodplain. Conspicuous because they retain the characteristic meandering channel pattern. They range from being permanently dry and largely filled in, to some with widely spaced waterholes to some that are often full of water and act as flood channels.

**Ridge line/crest:** A crest is a smoothly convex landform that stands above all, or almost all, points in adjacent terrain. A ridge line comprises a narrow crest with short adjoining slopes; the crest length is greater than the crest width.

**Ridge line/saddle:** A saddle on a ridge line is an area that occurs between two higher points (crests on the ridge line).

**Rocky ground:** Bare rock surfaces or thin soils with abundant rock. Can range from cliffs to flat benches. Steep rocky ground includes cliffs and steep slopes of rocky outcrop.

**Rocky ravine:** Valleys with very steep straight-sided slopes, narrow ridge crests and narrow valleys. Soils thin or absent on slopes. Main erosion process is mass movement along joints or bedding plains in rock; usually greater than 30 degrees. Creeks will have boulders, gravel and sand as a thin cover over bedrock. Channel gradients will be low to steep, with occasional rapids and waterfalls at bedrock steps.

**Sand sheets:** Deep, uniform medium to coarse sand. Possibly in situ weathering product of a particular stratum with or without subsequent reworking by wind into sand dunes.

**Sand monkey:** Term for a sandy Paleochannel ‘stringer.’ Unlike Paleochannels, which retains a concave shape and hold water, sand monkeys are convex at the surface. The channels are filled with deep medium sand, either yellow or red, depending on the drainage.

**Scald:** Bare areas where water and wind erosion has removed the topsoil, exposing (usually) saline subsoils that retard vegetation growth.

**Soil-mantled slopes:** Low to steep slopes with a continuous cover of soil and no rock outcrop.

Soils range from shallow to deep and a range of textures. Soils formed largely by in situ weathering of rock. Subject to sheet erosion and gullying only in extreme cases, but only usually with cultivation.

**Spur/crest:** Runs off a ridge line and is also a smoothly convex landform that stands above all or almost all points in the adjacent terrain. A saddle is an area that occurs between two higher points (crests) along the spur.

**Spur (secondary):** A spur that runs off a spur.

**Talus:** Blocks of rock at the base of a cliff, usually steep, >30 degrees.

**Terrace:** Abandoned floodplain. Abandonment caused by incision of river to greater depth so that floodwaters never or rarely reach this level. Will usually retain floodplain features of Paleochannels, flood channels etc although these may carry water less regularly than on the floodplain.
References

Adams, Michael

Amorosi, Lucy and Andrea Murphy

Australian Heritage Commission and the Australian Committee for IUCN

Australian Heritage Commission

Beltran, Javier

Bennett, Jeff

Brown, Steven
2005 Heritage management and community Engagement (Chapter 5). In CCC Aboriginal Cultural Heritage Data Audit. Cultural Heritage Division, NSW Department of Environment and Conservation.

Byrne, Denis, Helen Brayshaw and Tracy Ireland

Byrne, Denis and Maria Nugent

Carmichael, D.L.

Cohen, B.

English, Anthony, Sharon Veale, Jo Erskine and John Robinson

English, Anthony

English, Anthony and Lynn Baker

Fanning, Patricia and Simon Holdaway
Goulding, Megan


Harrison, Rodney


Henderson, Rick, David Simmons, S. Bourke and Lisa Janice Muir


Kabaila, Peter Rimas


Kvamme, K.L. and M.A. Jochim


Lucas, Damian


Memmott, Paul


NSW Heritage Office

2000  *Historical Research for Heritage*, Heritage Information Series, Parramatta NSW

NSW National Parks and Wildlife Service


Ollier, C.D.

Pardoe, Colin and Sarah Martin

Phillips, Adrian

Purcell, Phil

Ridges, Malcolm


Sutherland, Robert

Umwelt (Australia) Pty Limited
2004a  *Survey and Assessment of Impact on Aboriginal Cultural Heritage and Archaeological Values, Main Creek, Hunter Valley, NSW*. A report to Glennies Creek Coal Management Pty Limited (April).

Acknowledgments

The Department of Environment and Conservation NSW gratefully acknowledges the following for their generous input and assistance during the preparation of this publication:

- Karyn Apperley (NSW Department of Local Government)
- Dr Patricia Fanning (Graduate School of the Environment, Macquarie University)
- Dr Meg Goulding (Goulding Heritage Consulting P/L)
- Molly Trainor (Molly Trainor Illustration) for the illustrations and report design

The following DEC staff have contributed to the publication:

Jason Ardler, John Beattie, Cheryl Brown, Steve Brown, Denis Byrne, Russell Couch, Gary Currey, Robert Goodman, Anthony Hanna, Adrienne Howe-Piening, Ed Knowles, Margrit Koettig, Joanne McLean, Sabine Partl, Kathryn Przywolnik, Phil Purcell, Julie Ravallion, Mal Ridges, Kathleen Schilling, Julianne Smart, Katrina Stankowski, Bob Sutherland and Sharon Veale.
Aboriginal Cultural Heritage and Regional Studies: an illustrative approach