

**Proposed Subdivision Lot 101 DP 1087389 Millingandi Road, Millingandi
Aboriginal Archaeological Assessment**

A report to ngenvironmental

December 2009



New South Wales Archaeology Pty Limited

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1. SUMMARY

1.1 Introduction

New South Wales Archaeology Pty Ltd has been commissioned by ngenvironmental to undertake a cultural heritage assessment of Lot 101 DP 1087389, Millingandi Road, Millingandi, in relation to a proposed subdivision. This report documents the results of the assessment.

1.2 Aboriginal Consultation

This assessment has been conducted in accordance with the consultation process as outlined in the Interim Guidelines for Aboriginal Community Consultation - Requirements for Applicants (NSW DEC 2004). The field survey has been undertaken with the assistance of Ben Cruse of Eden Local Aboriginal Land Council (ELALC).

1.3 Objectives and Methods

An archaeological investigation of the proposal area has been conducted by Andrew Pearce, New South Wales Archaeology Pty Ltd and Ben Cruse, ELALC.

The study has sought to identify and record any Aboriginal objects that may be present on ground surfaces, to assess the subsurface archaeological potential of landforms and to formulate management recommendations based on the results of background research and field survey assessment.

The approach to archaeological recording in the current study has been a 'nonsite' methodology. It is assumed that stone artefacts will be distributed across the landscape in a continuum, with significant variations in artefact density and nature within different landforms. While cultural factors will have informed the nature of land use, and the resultant artefact discard, environmental variables are those which can be utilised archaeologically in order to record and analyse variability across the landscape.

A landscape based approach and methodology has therefore been implemented during this study. The proposal area has been divided into a number of Survey Units defined according to landform morphological type. Survey Units are utilised as a framework for recording, analysis and the formulation of management and mitigation strategies.

The New South Wales National Parks and Wildlife Service (now incorporated in the Department of Environment, Climate Change and Water – the *NSW DECCW*) has prepared a draft document that provides a series of guidelines regarding the assessment and management of Aboriginal cultural heritage in New South Wales. This report has been prepared in accordance with these draft guidelines (NSW NPWS 1997). Additionally the study has been conducted in accordance with the Draft Guidelines for Aboriginal Cultural Heritage Impact Assessment and Community Consultation (NSW DEC July 2005). These guidelines have been prepared specifically for development applications assessed under Part 3A of the Environmental Planning and Assessment Act 1979.

1.4 Heritage Context

A search of the NSW DECCW Aboriginal Heritage Management Information System has been undertaken (AHIMS search #28351) indicating that no previously recorded Aboriginal objects are listed for the proposal area.

1.5 Results and Impact Assessment

The development area has been divided into four Survey Units; the total Survey Unit area measured 10.9 hectares. It is estimated that approximately 6.4 hectares of that area was subject to survey inspection, focusing on areas of ground exposure. Ground exposures inspected are estimated to have been 0.4 hectares in area. Of that ground exposure area archaeological visibility (the potential artefact bearing soil profile) is estimated to have been 0.13 hectares. Effective Survey Coverage is calculated to have been 1.2% of the proposal area.

No Aboriginal objects were located during the field survey. Furthermore the Survey Units are each assessed to be of low archaeological sensitivity; *that is* – artefact density of any subsurface deposit is predicted to be either very low or low. The archaeological significance of any unrecorded Aboriginal objects is predicted to be low.

The subdivision will cause physical impacts to any Aboriginal objects which may be located within direct impact areas - *irrespective of their significance*; any Aboriginal object situated within an area of impact will be comprehensively disturbed and/or destroyed during subdivision construction.

As with any development the chances of impacting Aboriginal objects, particularly stone artefacts, is high given that they are present in a continuum across the landscape and located on or within ground surfaces. However in regard to Aboriginal objects such as low density artefact distributions which are assessed to be of low significance, proposed impacts can be viewed as being of correspondingly low significance. This assessment forms the basis for the formulation of recommendations ensuing from the assessment. It is concluded that the development impact to any Aboriginal objects present will be of low significance.

1.6 Statutory Context

The Environmental Planning and Assessment Act 1979 (EP&A Act), its regulations, schedules and guidelines, provides the context for the requirement for environmental impact assessments to be undertaken during land use planning (NPWS 1997).

This project will be assessed under Part 3A of the EP&A Act. Part 3A applies to all major State government infrastructure projects, developments previously classified as State significant and other projects, plans or programs of works declared by the Minister. Under the terms of Part 3A of the EP&A Act the following relevant authorization is not required for an approved project (and accordingly the provisions of an Act that prohibit an activity without such an authority do not apply):

- a permit under section 87 or a consent under section 90 of the National Parks and Wildlife Act 1974.

1.7 Recommendations

There are no identified Aboriginal heritage constraints relating to the proposed subdivision.

2. INTRODUCTION

New South Wales Archaeology Pty Ltd has been commissioned by ngenvironmental to undertake a cultural heritage assessment of Lot 101 DP 1087389 Millingandi Road, Millingandi, in relation to a proposed subdivision (Figure 1). It is proposed to subdivide the property into 11 lots. The proposed subdivision is defined as a Major Project under Part 3A of the Environmental Planning and Assessment Act 1979.

The NSW Department of Planning has provided the proponent with advice relating to Aboriginal Cultural Heritage as addressed in an earlier submission of this proposal. The NSW Department of Planning has advised that “a number of known Aboriginal artefacts (are) located close to the subject site, and DECCW therefore considers that artefacts are likely (to) occur on the subject site”. Accordingly it advised that an Aboriginal Cultural Heritage Assessment be undertaken by an independent archaeologist in order to identify the nature, extent and significance of proposed impacts on Aboriginal cultural heritage values across the study area. This report addresses those issues.

This project has been managed by Julie Dibden, New South Wales Archaeology Pty Ltd. A field investigation within the study area has been conducted by Andrew Pearce, New South Wales Archaeology Pty Ltd and Ben Cruse, representing Eden Local Aboriginal Land Council. This report has been written by Julie Dibden and Andrew Pearce.

In accordance with the guidelines for archaeological reporting (NSW NPWS 1997) and the Guidelines for Aboriginal Cultural Heritage Impact Assessment and Community Consultation (NSW DEC 2005) this report aims to document:

- The Aboriginal consultation process undertaken for the project and the involvement in the project of the Aboriginal community (Section 3);
- A description of the proposal and whether or not it has the potential to result in impacts to Aboriginal cultural heritage (Section 4);
- A description of the impact history of the proposal area (Section 4);
- The methodology implemented during the study (Section 5);
- The landscape and natural resources of the study area in order to establish background parameters (Section 6);
- A review of archaeological and relevant literature and heritage listings on the NSW DECCW Aboriginal Heritage Information Management System (Section 7);
- A synthesis of local and regional archaeology (Section 7);
- A predictive model of Aboriginal object type and location relevant to the proposal area (Section 7);
- The cultural and archaeological sensitivity of the landforms subject to proposed impacts (Section 8);
- The field survey results (Section 8);
- The significance of Aboriginal objects (Section 10);
- An assessment of the impact of the proposal on Aboriginal objects (Section 10); and
- A series of recommendations based on the results of the investigation (Sections 10 and 11).



Figure 1. Location of the study area (Topoview Raster 2006).

3. PARTNERSHIP WITH THE ABORIGINAL COMMUNITY

This project has been undertaken in accordance with the NSW DECCW Interim Guidelines for Aboriginal Community Consultation - Requirements for Applicants (IGACC) (NSW DEC 2004). The NSW DECCW requires proponents to undertake consultation with the Aboriginal community "...as an integral part of the impact assessment" process.

The NSW DECCW manages Aboriginal cultural heritage in NSW in accordance with the National Parks and Wildlife Act 1974. Part 6 of the Act provides protection for Aboriginal objects and Aboriginal Places. When an activity is likely to impact Aboriginal objects or declared Aboriginal Places approval of the Director-General of the NSW DECCW under s90 or s87 of the NPW Act is generally required. When administering its approval functions under the NPW Act the NSW DECCW requires applicants to have consulted with the Aboriginal community about the Aboriginal cultural heritage values (cultural significance) of Aboriginal objects and places present in the area subject to development (NSW DEC 2004).

The NSW DECCW requires consultation with the Aboriginal community because it recognises the following:

- That Aboriginal heritage has a cultural and archaeological significance and that both should be the subject of assessment to inform its decision process;
- That Aboriginal people are the primary determinants of the significance of their heritage;
- That Aboriginal community involvement should occur early in the assessment process to ensure that their values and concerns can be taken into account and so that their own decision making structures can function;
- That the information arising from consultation allows consideration of Aboriginal community views about significance and impact and allows for management and mitigation measures to be considered in an informed way (NSW DEC 2004).

The community consultation process as outlined in the IGACC document aims to improve the assessment by providing the Aboriginal community with an opportunity to:

- Influence the design of the assessment of cultural and scientific significance;
- Provide relevant information about cultural significance values of objects/places;
- Contribute to the development of cultural heritage management recommendations; and
- Provide comment on draft assessment reports (NSW DEC 2004).

The role of the Aboriginal Community is outlined as follows:

- The Aboriginal community is the primary determinant of the significance of their heritage;
- The Aboriginal community may participate in the process via comment on the assessment methodology, contribution of cultural knowledge; and
- The Aboriginal Community may comment on cultural significance of potential impacts and/or mitigation measures.

In order to fulfil the consultation requirements as outlined in the IGACC document NSW Archaeology Pty Ltd, on behalf of the proponent, has followed the following procedure:

1. Notification and Registration of Interests

The proponent has actively sought to identify stakeholder groups or people wishing to be consulted about the project and has invited them to register their interest as follows:

Written notification about the project dated 13th November 2009 has been supplied to the following bodies:

- The Eden Local Aboriginal Land Council
- Native Title Services
- Bega Valley Shire Council
- NSW Department of Environment, Climate Change and Water

The closing date of registration of interest was 27th November 2009.

The investigation area is not situated within a National Park listed on schedule 14 of the National Parks and Wildlife Act, 1974 which possesses a Register of Aboriginal Owners. Accordingly, the Registrar of Aboriginal Owners was not notified of the project.

In addition an advertisement was placed in the Merimbula News Weekly (11th November 2009) providing notification of the cultural heritage study.

The closing date of registration of interest was 30th November 2009.

The following individuals or groups formally registered an interest in this project:

- The Eden Local Aboriginal Land Council
- John Dixon – Ngarigo Consultancy Pty Ltd

It is also noted that correspondence has been received from NSW DECCW, dated 2nd December 2009, listing a number of Aboriginal groups and individuals who may have an interest in the project. Given this letter was received on the 7th December 2009 and after the field work was conducted, that no Aboriginal objects were recorded, and that the proposal area was assessed to be of low archaeological sensitivity, additional letters of notification have not been sent to these parties.

2. Preparation for the Assessment (design)

Following on from the abovementioned registrations of interest a proposed methodology for the study has been supplied to the two parties who formally registered an interest, dated 1st December 2009.

3. Drafting, Review and Finalisation of the Cultural Heritage Assessment Report

The draft report has been provided to all stakeholders for review and comment.

The proposal area falls within the boundaries of the Eden Local Aboriginal Land Council (ELALC). In accordance with Part C of the NSW DECCW Interim Guidelines for Aboriginal Community Consultation - Requirements for Applicants, given the scale and nature of the project, the proponent engaged the services of the ELALC to participate in the field assessment.

4. PROPOSED IMPACTS

The information contained in this section of the report is provided in accordance with the NSW NPWS (1997) guidelines for archaeological survey reporting. A description of the proposal and potential impacts on the landscape and heritage resource is described below. This information includes a summary of the impact history of the study area. These prior impacts have caused some changes to the land surface in the property with an associated effect on the archaeological resource.

4.1 Proposed Impacts

It is proposed to subdivide Lot 101 DP 1087389, Millingandi Road, Millingandi into 11 rural residential lots (Figure 2). The sizes of the proposed lots will range from 0.5 ha to 1.77 ha. Upon receipt of development approval and eventual sale, the lots will be subject to impacts relating to domestic occupation, including the erection of dwellings, access roads and services. Given the relatively large size of each lot, eventual impacts are likely to be limited in nature, rather than comprehensive in relation to the entire subdivision area.

4.2 Prior Impacts

The proposal area has undergone variable levels of previous impacts which range from high in localised areas to low elsewhere. The entire property has been cleared, with the exception of a small number of mature eucalypt trees. Three buildings, comprised of a residential house and two large sheds, have been constructed on mechanically levelled areas, and a partially sealed driveway extends from Millingandi Road to the house and sheds. Another graded access track extends along the western boundary of the property. The entire property is fenced, with some internal fencing, and an electricity transmission line runs along the internal side of the eastern boundary. In addition, the former ephemeral creek line which runs the length of the property appears to have been mechanically cleared and landscaped. Generally however, previous impacts have been of a low level in other areas of the property.

4.3 Potential for Impacts to Aboriginal Objects

While the proposal area has suffered numerous prior impacts which will have caused varying degrees of disturbance to any Aboriginal objects present, given the nature of the proposed subdivision the development has the potential to cause additional impacts to Aboriginal objects.

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5. OBJECTIVES AND METHODS

This study has sought to identify and record any Aboriginal objects that may be present on ground surfaces in the proposal area, to assess the subsurface archaeological potential of the landforms and to formulate management recommendations based on the results of background research, a field survey and site significance assessment.

The assessment has included the following components:

- A NSW DECCW Aboriginal Heritage Information Management System site search to determine whether or not previously recorded Aboriginal objects are present in the proposal area and to list the type of sites known to be present within the local area.
- A review of local and regional archaeological reports and other relevant documents in order to provide a contextual framework to the study and heritage management assessment.
- A review of the environmental context of the proposal area.
- A review of resources the area would have provided to Aboriginal people.
- A comprehensive field survey of the proposal area aimed at recording Aboriginal objects and assessing the nature of potential subsurface archaeological deposit.
- Documentation of survey results.
- An analysis of survey results.
- A significance assessment.
- The formulation of a set of management recommendations ensuing from the above.

5.1 Literature Review

Background research has been conducted to determine if known Aboriginal objects are located in the vicinity of the proposal area and to assist in the formulation of a predictive model of site type and location relevant to the proposal area.

The following information sources have been accessed for this study:

- The NSW DECCW Aboriginal Heritage Information Management System.
- Relevant archaeological reports and site cards held in the NSW DECCW archives.
- Background information and mapping supplied by the proponent.
- Pambula 1:25,000 topographic map.

5.2 Field Survey and Methodology

It is noted that two representatives of ELALC have previously surveyed the property at which time no Aboriginal objects were recorded and the property was assessed to be of low archaeological potential. The current field survey entailed a pedestrian survey undertaken by two people; survey coverage is described in Section 8 of this report.

The field survey was aimed at locating Aboriginal objects. An assessment was also made of prior land disturbance, survey coverage variables (ground exposure and archaeological visibility) and the potential archaeological sensitivity of the land. Each Survey Unit was surveyed until the entire area had been systematically inspected. This methodology enabled direct visual inspection of as much of the ground surface of the proposal area as practicable.

The approach to recording in the current study has been a ‘nonsite’ methodology: the elementary unit recorded is an artefact rather than a site (*cf* Dunnell 1993; Shott 1995). The rationale behind this approach is that artefacts may be directly observed however ‘sites’ are a construction within an interpretative process. Given that it can be expected that full archaeological visibility will not

be encountered during the survey the process of identifying site boundaries (if they exist at all) will not be possible.

The density and nature of the artefact distribution will vary across the landscape in accordance with a number of behavioural factors which resulted in artefact discard. While cultural factors will have informed the nature of land use, and the resultant artefact discard, environmental variables are those which can be utilised archaeologically in order to analyse the variability in artefact density and nature across the landscape. Accordingly in this study while the artefact is the elementary unit recorded it is the Survey Unit which is utilised as a framework of recording, analysis, and management (*cf* Wandsnider and Camilli 1992). The study area has been divided into four Survey Units each of which has been defined according to landform morphological type.

Landscape variables utilised are conventional categories as defined in the *Australian Soil and Land Survey Field Handbook* (McDonald *et al.* 1998).

5.3 Survey Coverage Variables

Survey coverage variables are a measure of ground surveyed during the study and the type of archaeological visibility present within that surveyed area. Survey coverage variables provide a measure with which to assess the effectiveness of the survey so as to provide an informed basis for the formulation of management strategies.

Specifically, an analysis of survey coverage is necessary in order to determine whether or not the opportunity to observe artefacts in or on the ground was achieved during the survey. In the event that it is determined that ground exposures provided a minimal opportunity to record stone artefacts it may be necessary to undertake archaeological test excavation for determining whether or not artefacts are present. Conversely, if ground exposures encountered provided an ideal opportunity to record the presence of artefacts, the survey results may be considered to be adequate and accordingly no further archaeological work may be required.

Two variables were used to measure ground surface visibility during the study; the area of ground exposure encountered and the quality and type of ground visibility (archaeological visibility) within those exposures. The survey coverage variables estimated during the survey are defined as follows:

Ground Exposure – an estimate of area of exposures of bare ground; and

Archaeology Visibility – an estimate of the average levels of potential archaeological surface visibility within those exposures of bare ground. Archaeological visibility is generally less than ground exposure as it is dependent on adequate breaching of the bare ground surface which provides a view of the subsurface soil context. Based on subsurface test excavation results conducted in a range of different soil types across the New South Wales southeast it is understood that artefacts are primarily situated at a depth of between 10 - 30 cm below the ground surface; reasonable archaeological visibility therefore requires breaching of the ground surface to at least a depth of 10 cm.

Based on the two visibility variables as defined above, an estimate (Net Effective Exposure) of the archaeological potential of exposure area within a Survey Unit has been calculated. The Effective Survey Coverage (ESC) calculation is a percentage estimate of the proportion of the Survey Unit which provided the potential to view archaeological material.

6. LANDSCAPE CONTEXT

A consideration of the landscape is necessary in archaeological work in order to characterise and predict the nature of Aboriginal occupation across the land (NPWS 1997). In Aboriginal society landscape could be both the embodiment of Ancestral Beings and the basis of a social geography and economic and technological endeavour. The various features and elements of the landscape are/were physical and metaphysical places that are known and understood within the context of social and cultural practice.

Given that the natural resources that Aboriginal people harvested and utilised were not evenly distributed across landscapes, Aboriginal occupation and the archaeological manifestations of that occupation, will not be uniform across space. Therefore, the examination of the environmental context of a study area is valuable for predicting the type and nature of Aboriginal objects which might be expected to occur. Factors that typically inform the archaeological potential of a place include the presence or absence of water, animal and plant foods, stone and other resources and as well, the nature of the terrain. The cultural meaning associated with a locale may also determine the nature of its use and the archaeological potential of a place.

Additionally, geomorphological and humanly activated processes need to be defined as these will influence the degree to which Aboriginal objects may be visible and/or conserved. Land which is heavily grassed will prevent the detection of archaeological material while land which has suffered disturbance may no longer retain artefacts or stratified deposits. A consideration of such factors is necessary in assessing site significance and formulating mitigation and management recommendations.

The following section provides information in regard to the landscape context of the proposal area.

6.1 Topography, Geology and Vegetation

The study area comprises Lot 101 DP 1087389, County of Auckland, Parish of Pambula. The area is situated west of the township of Merimbula on the Far South Coast of New South Wales (Figures 1 and 3).

The Merimbula area, including the proposal area, falls within the Yellow Pinch landscape unit (Tulau 1997). This land system is characterised by rolling to steep hills. Crests are narrow and gradients tend to be steep; drainage lines are closely spaced.

The property is comprised of a combination of landform elements including a crest, simple slopes and the open depression of an ephemeral creek. This unnamed 2nd order drainage line extends northwards through the middle of the property and drains into Merimbula Lake. The gradient across the property varies from moderate on the crest and a side slope to very gentle along the drainage depression and the westernmost simple slope.

The geology of the area is comprised of Tertiary deposits of gravel, sand, sandstone, clay and lignite (Monaro 1:500 000 Sheet). The property is currently cleared however previously would have possessed an open forest or woodland vegetation structure.

6.2 Summary

The proposal area is assessed as unlikely to have been targeted by Aboriginal people for long term, intensive, or permanent occupation that would have resulted in significant levels of

artefact discard. Instead the study area is likely to have been utilised for hunting and gathering forays conducted away from base camps and for thoroughfare movement. Such land usage is predicted to have resulted in low levels of artefact discard. Accordingly the study area is predicted to be of low archaeological potential and sensitivity.

7. ARCHAEOLOGICAL CONTEXT

7.1 Social Geography and Occupation Models

On the basis of archaeological research it is known that Aboriginal people have occupied Australia for at least 40,000 years and possibly as long as 60,000 years (Mulvaney and Kamminga 1999: 2). By 35,000 years all major environmental zones in Australia, including periglacial environments of Tasmania, were occupied (Mulvaney and Kamminga 1999: 114).

At the time of early occupation Australia experienced moderate temperatures. However, between 25,000 and 12,000 years before present - BP (a period called the Last Glacial Maximum), dry and either intensely hot or cold temperatures prevailed over most of the continent (Mulvaney and Kamminga 1999: 114). At this time the mean monthly temperatures on land were 6-10°C lower; in southern Australia coldness, drought and winds acted to change the vegetation structure from forests to grass and shrublands (Mulvaney and Kamminga 1999: 115-116).

With the cessation of glacial conditions, temperatures rose with a concomitant rise in sea levels. During the Late Pleistocene the sea was as much as 130 metres below the present level, and accordingly, the continent was correspondingly larger. By ca. 6000 BP sea levels had risen and more or less stabilised at their current position. With the changes in climate during the Holocene Aboriginal occupants had to deal with reduced landmass and changing vegetation and hydrological systems; forests again inhabited the grass and shrublands which had been present at the time of the Late Glacial Maximum. As Mulvaney and Kamminga (1999: 120) have remarked:

When humans arrived on Sahul's shores and dispersed across the continent, they faced a continual series of environmental challenges that persisted throughout the Pleistocene. The adaptability and endurance in colonising Sahul is one of humankind's inspiring epics.

Occupation of the NSW south coast dates from at least 20,000 BP as evidenced by dated sites at Burrill Lake (Lampert 1971), and two sites near Buchan in Victoria; Cloggs Cave (Flood 1980) and New Guinea 2 (Ossa *et al.* 1995). The Bulee Brook 2 site in the south coast hinterland ranges, excavated by Boot (1994), provides evidence that occupation of this zone had occurred by at least 18,000 years ago. These known Pleistocene occupation sites are few on the south coast; the majority of recorded sites date from the mid to late Holocene at the time when the sea more or less stabilized to its current level. It is nevertheless reasonable to assume that the Merimbula area was occupied and utilised by Aboriginal people from the late Pleistocene onwards.

The study area lies within the area defined by Tindale (1974) as that belonging to the Thaua people. The Thaua people are described as occupying land south from Wallagoot Lake to Green Cape (south of Eden) and inland to the escarpment of the Great Divide. Tindale (1974) notes that there were two groups of Thaua, the Katungal, or 'sea coast people' and the Baianbal or Paianbara, - the inland 'tomahawk people'. Both 'tribes' belonged to the Yuin 'cultural area' whose groups shared cultural characteristics such as a common initiation ceremony and closely related languages. Eades (1976) describes the Dyrirringan language as being spoken in the area between Wallaga Lake and Twofold Bay with the Thawa language spoken south of Twofold Bay.

Observations from the Bega/Eden region indicate that Aboriginal people relied heavily on coastal resources such as fish and shellfish and that camps were located on coastal dunes or in forests within close proximity to the coast (Sullivan 1982).

The European settlement of the far south coast caused significant changes to Aboriginal life. After the initial invasion Aboriginal people began to find employment within the new settler

economy. In the early days of settlement they had continued access to many lands and maintained many cultural and social traditions (Chittick & Fox 1997:191). By 1882 Aborigines lived mostly in camps around the small town of Bega, until 1891 when the Aboriginal Protection Board established the Wallaga Lake Reserve, which became a virtual prison (Byrne 1984). In the 1940s and 1950s the Aboriginal people worked as seasonal labourers in the bean and pea fields and after World War 2 in the timber industry.

7.2 Previously Recorded Aboriginal Objects

A search of the NSW DECCW Aboriginal Heritage Management Information System has been conducted for this project on the 1st December 2009 (AHIMS #28351). The search area measured 4 km² and encompassed eastings 754000 – 756000, and northings 5913000 – 5915000. Six previously recorded sites are listed on the AHIMS search. Of these, five sites are within reasonably close proximity to the study area (see below). The locations of these sites are shown in Figure 3.

The AHIMS register only includes sites which have been reported to NSW DECCW. Accordingly, this search cannot be considered to be an actual or exhaustive inventory of Aboriginal sites situated within the local area. Generally, sites are only recorded during targeted surveys undertaken in either development or research contexts. It can be expected that additional Aboriginal objects will be present within the local area but that to date they have not been recorded and/or reported to NSW NPWS/DECCW.

It is noted that the AHIMS register lists five sites within reasonably close proximity of the study area. All were recorded by Navin in 1989 in relation to an archaeological assessment of the Merimbula bypass routes for the Princes Highway. These five sites are discussed below:

- Site # 62-6-174 is located within a riverine/wetland environment, on a level area of a small spur between two drainage lines where they intersect with a wetland. The site is situated some 50 metres from a perennial source of drinking water and was made visible as a result of significant disturbance in the form of ploughing and land clearing. It consists of a low to medium density artefact scatter with in excess of 30 stone artefacts and the potential for more artefacts in a subsurface context.
- Site # 62-6-175 is located on a level area along the eroded edge slope of a former river terrace within a riverine/wetland environment, and some 150 metres from a permanent source of drinking water. This site consisted of four stone artefacts found within 3 metres of each other.
- Site # 62-6-176 is located in two flat exposures 20 metres apart and within 20 metres of the edge of a river terrace, some 200 metres from a perennial source of drinking water. Twenty artefacts were recorded in two exposures.
- Site # 62-6-178 is located on a small narrow and elevated alluvial flat at the intersection of a small stream and Millingandi Creek. The site is a low density artefact scatter comprising 16 artefacts, most of which are quartz.
- Site # 62-6-180 is located on a bank of an intermittent stream gully. The site is a low density artefact scatter comprising three stone artefacts.

The most common Aboriginal object recordings in the region are distributions of stone artefacts and middens. Rare site types include rock shelters, scarred trees, quarry and procurement sites, burials, stone arrangements, carved trees and traditional story or other ceremonial places.

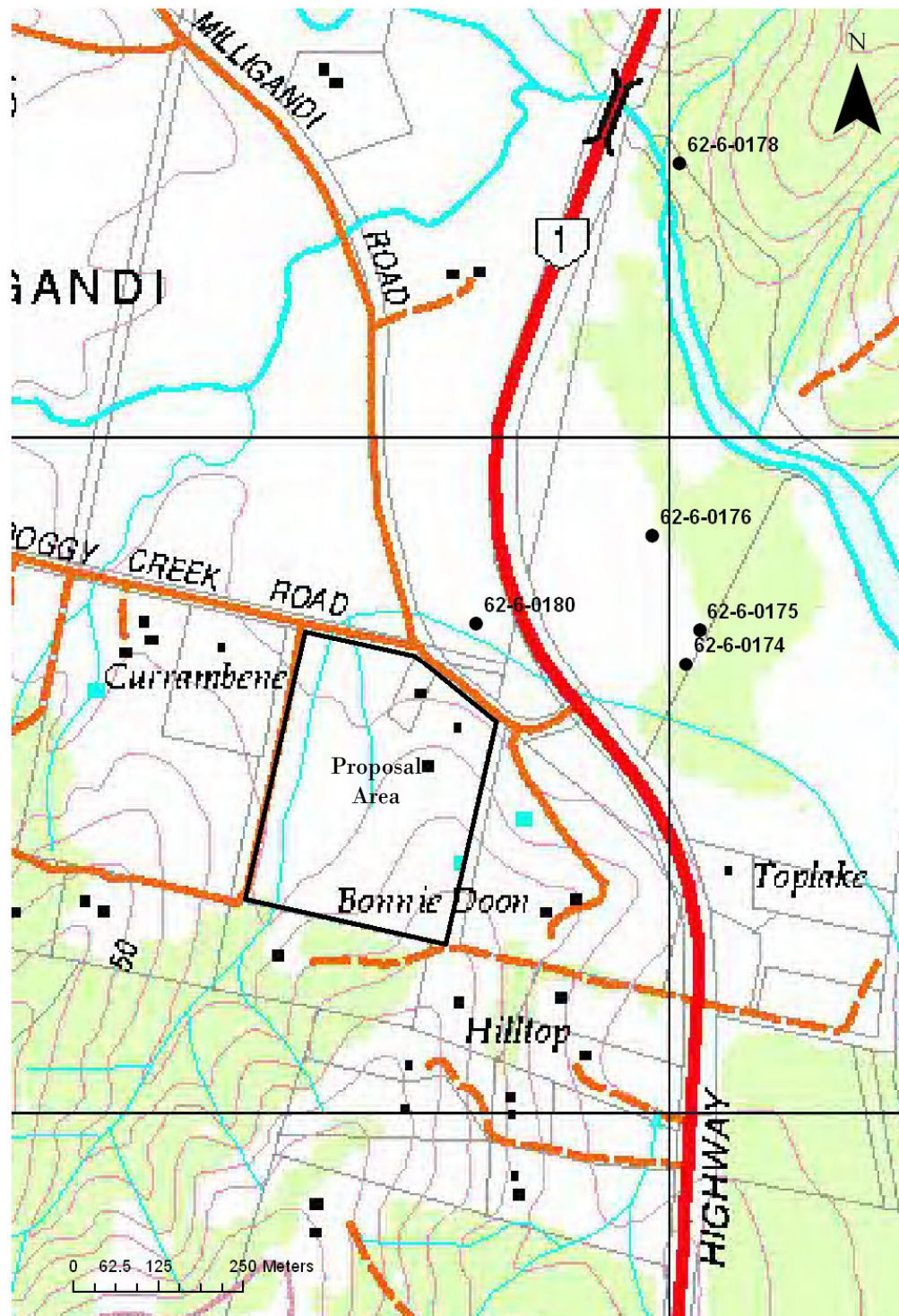


Figure 3. Location of AHIMS Aboriginal objects located in close proximity to the proposal area.

7.3 Archaeology of the Local Area

Numerous studies have been undertaken, both in an academic and consultancy context, on the Far South Coast region. Consideration of a predictive model of site type and site location within a geographical context relevant to the study area can be made through recourse to these previous

studies. From this a contextual and relevant assessment of the archaeological potential of the study area can be formed.

The consideration by a number of researchers with regard to the nature of Aboriginal occupation prior to European settlement on the South Coast has resulted in conflicting arguments. Perceived higher site densities on the coast compared to forested hinterland contexts have led researchers, until recently, to argue that the coast was the focus of Aboriginal occupation and landuse.

Poiner (1976) proposed semi-nomadic occupation of the coast during summer and nomadic occupation of both the coast and hinterland during winter. However, this model was based on scanty evidence (Hiscock 1982) and an assumption that hinterland sites were few in number, small and widespread (Boot 2002). The strong seasonal focus of Poiner's (1976) model is inappropriate however, given that the mesothermal climate which prevails on the south coast presents only limited seasonal variation (Boot 2002).

Attenbrow (1976) argued that the major determinant of Aboriginal land use would have been the carrying capacity of the land. While Attenbrow (1976) proposed that groups would have utilized the coast and inland at all times of the year she argued that in spring, summer and autumn more people in larger numbers would have occupied the coastal zone practicing a largely marine economy and in winter smaller groups would be spread more evenly across country subsisting on a higher proportion of land animals. She predicted that areas such as coastal margins and inland valleys would have supported larger populations than the mountain slopes or foothills.

The forest-woodland environment contains large numbers of land mammals and plants (Attenbrow 1976). Poiner (1976) and Attenbrow (1976) have argued that both inland and marine resources declined in both range and abundance during winter. Poiner (1976) argued that the sea was the source of the bulk of food resources.

Vallance (1983) argued that a range of subsistence strategies would have been pursued and that these would have varied both within and between seasons and from year to year. This shift away from a seasonal model has been further expanded by Boot (1994) who has predicted that based on the Vallance (1983) model larger archaeological sites could be expected to be situated in areas where large quantities of food are available, either on a single occasion or on a regular basis, with smaller sites located elsewhere reflecting short term occupation or movement between focused occupation sites. Based on work undertaken during his doctoral research Boot (1994) has argued that the hinterland occupation was "widespread and very dense..." during the past 4000 years.

Prior to these debates within the academy, Geological Surveyor William Anderson recorded and excavated several Aboriginal midden sites in the region (Anderson 1890). Anderson (1890) mapped the location of major 'shell-heaps' at Wagonga Inlet and Pambula Lake. Anderson noted that the coastal zone in the area "...seems from all accounts to have been permanently inhabited by certain tribes of Aborigines, who occupied specialized areas in the district". Anderson (1890) described the results of the excavation of two middens at Wagonga Inlet in some detail. Both contained deep deposits; one 5' deep and the other 3'. The skeleton of a dingo was retrieved from one midden. Sullivan (1982) subsequently examined the middens of the south coast as the topic of her doctoral research.

One of the preliminary consultancy projects undertaken on the south coast was conducted by Sullivan and Gibbney (1978) for the CSIRO. The study was aimed at identifying and recording locations containing evidence of Aboriginal and early non-Aboriginal occupation. Two hundred and eleven Aboriginal sites were listed during the survey. Site types recorded include shield and canoe trees, surface campsites, hatchet grinding grooves and stratified deposits including open shell middens and rock shelters (Sullivan and Gibbney 1978: 197).

From this time archaeologists began investigations in the south coast conducted within the context of the environmental impact assessment process. A large number of studies have been undertaken in the Merimbula area.

Aiken (1986) conducted a survey in response to a proposed housing development of a two square kilometre parcel of land situated north of Merimbula township. During that study the majority of each of the different environmental zones in the area was surveyed including lagoon margins, beach, ridgelines, slopes and creeks. Given the forested nature of the area visibility conditions were low with the exception of small areas of exposure. One Aboriginal site was recorded on the east side of Pages Creek on the footslope situated above Back Lagoon. The site consisted of 14 stone artefacts distributed over an 8 m x 30 m area. The lack of further archaeological recordings was assessed by Aiken (1986) to be a factor of low visibility variables rather than a true reflection of the archaeological status of the study area.

Aiken (1986) recommended subsurface investigation to be undertaken in the area of the recorded Aboriginal site and the remainder of the area which she assessed to be of moderate to high archaeological sensitivity. Lance (1987) subsequently conducted a limited program of subsurface investigations on the property in accordance with Aiken's (1986) recommendations. Auger and shovel pits were excavated in a number of locations. The results of Lance's (1987) works are summarized below:

The beach barrier sand dunes and flats between Short Point Beach and Back Lagoon

The test pits conducted in this area revealed a sequence of beach sands with a humic rich soil formation overlain by a shallow band of bleached sand. A friable light grey sand derived from swamp deposits were encountered below the humic rich horizon. The archaeological material recovered consisted of a dispersed scatter of marine shell which Lance (1987) thought probably originated from a larger shell midden.

The foreshore of Back Lagoon and the smaller lagoon to the north

In the Back Lagoon area shallow sandy soils were found to overlie sandstone bedrock. Two artefacts were found on the surface however test excavation revealed no further archaeological material. One surface artefact scatter was found in this area. The artefacts were located on a track on the lower slopes of gently sloping ground 60 m from the north east shore of Back Lagoon. Twelve artefacts were recorded over a length of track measuring 25 m long. Test excavation in the vicinity of the site revealed a shallow sandy soil overlying decomposing sandstone bedrock. Several fragments of marine shell were found suggesting that the exposed portion of the site would originally have contained shell midden which has been dispersed by vehicle and water movement. No artefacts were found in a subsurface context in association with the surface finds.

The major ridge

Augering revealed shallow sandy deposits overlying bedrock. No artefacts or shell were recorded in subsurface contexts. Lance concluded that the low artefact density recorded by Aiken (1986) during the surface survey was an accurate reflection of artefact numbers in the deposit.

Lance (1987) concluded that low levels of archaeological material were present and that this represented low levels of prehistoric usage of the area. Lance (1987) argued that while additional material could be present in the area it was likely to be distributed at low density. Lance (1987) presented several reasons which might explain this situation; - that shallow lagoons did not provide a wide range of edible fauna and that therefore the area was less attractive than the nearby Merimbula Lake, that the sloping ground was an unattractive camping location and that geomorphological processes may have removed material from the area.

Williams (1998) later conducted an archaeological investigation of a 7.2 hectare portion of the same property in a section adjacent to Back Lagoon. The study was conducted in respect of a new proposal to develop the land as a health retreat. The study area included the main spur crest, upper, mid and lower side slopes, creek bottom and the lake foreshore. Visibility encountered was assessed to be generally very poor, however Williams (1998) argued that the survey results are indicative of the survey potential of the area. One small Aboriginal site was recorded. The site is described as consisting of three stone artefacts located on a spur crest over an area of 15 metres. All artefacts were flakes made of purple rhyolite.

Hughes (1982a) investigated an area on the northern shores of Merimbula Lake. The property consisted of low sandy flats, cliffs and slopes above the lake. Six middens situated on the cliffline at the junction of the hill slopes and rock platforms and estuarine sand flats were recorded by Hughes (1982a). The relatively intact, large middens consisted almost entirely of estuarine species: rock oyster, mud oyster, cockle, mud whelk and mussel, the latter being present in the upper parts of the middens only. Stone artefacts, charcoal, fish bones and scales were also noted in some middens (Hughes 1982a).

Hughes (1983) conducted a further study of the Merimbula Lake foreshore and slopes above the lake. An additional nine sites, including eight discrete middens/midden complexes and a stone artefact scatter were located. Hughes (1983) indicated that midden material is virtually continuous along parts of the cliff line and estuarine sand flats fronting the lake.

Hughes (1982b) also surveyed 24 hectares of hilly terrain one kilometre north-west of Merimbula. One small artefact scatter was located on a broad ridge crest. The scatter consisted of six quartz flakes and unmodified pieces and one acid volcanic flake.

Egloff (1988) conducted an assessment at the proposed effluent disposal works site situated four kilometres south of Merimbula. One shell midden, one artefact scatter and three human burials were located.

Feary (1988) conducted a survey at a car park situated on top of a steep cliff above Tura Beach. No sites were located but conditions of surface visibility were low. At Widgeran, 1.5 km south-west of Bournda Island, Feary (1988) located four small artefact scatters on a lower/basal north facing slope. Feary (1988) interpreted the sites as being smaller sites associated with a large base camp site, or the widespread dispersal of a very large site caused by previous impacts and construction of Widgeran nursery.

Navin (1989) surveyed the route of three alternative Princes Highway Merimbula bypass routes at Millingandi. The study area included two landform areas – a moderately steep forested ridge line situated north of Millingandi Creek, and a flat river terrace south of the creek. Seven sites were recorded. Two sites are situated north of Millingandi Creek on ridge spurs. One site is situated on the northern bank of Millingandi Creek at the intersection of a small stream. The remaining four sites are located on an elevated river terrace situated between creek flats and colluvial slope deposits. Artefacts recorded included silcrete, quartz and rhyolite. Five of these sites are located in the vicinity of the proposal area (see Section 7.2).

Barber (1998) surveyed a small house lot on the foreshore of Merimbula Lake. Shell material was found across the disturbed topsoil of the property. Oakley (2000) also surveyed a small lot on Main Street, Merimbula situated on the isthmus separating Back Lagoon from Merimbula Lake. Shell material was identified but Oakley (2000) argued that the material may not have been of Aboriginal origin.

Kuskie and Gutierrez (2000) conducted a survey of the ten hectare Merimbula Cove property located on the northern shores of Merimbula Lake. Six Aboriginal sites were located including

middens, one artefact scatter and one isolated stone artefact. The middens contained estuarine shellfish species of predominantly cockle with some mud oyster and whelk. Stone artefacts were made on locally available rhyolite and quartz and were interpreted to be representative of non-specific flaking activities and microblade production. Kuskie and Gutierrez (2000) found that sites were tethered to level to moderate sloping simple slopes and spur crests within 100 metres or so of the lake margin.

Kuskie and Webster (2001) conducted test excavation at a midden site situated on a ridge crest overlooking Merimbula Creek. The investigation revealed the presence of three low density scatters of shell across site. No stone artefacts were recorded.

Kuskie (2002) surveyed six hectares of the proposed Lakewood residential development on the northern shore of Merimbula Lake. No Aboriginal sites were recorded and this result was explained to be a factor of the steepness of the hill slopes and accordingly the low archaeological potential of the area.

Wheeler and Douglas (2003) conducted a survey at the site of the Merimbula Public School situated on an isthmus between Merimbula Lake and Back Lagoon. While some areas of the site were found to be grossly modified, it was assessed that the majority of the site is undisturbed. Stone artefacts and midden material were recorded in surface exposures. Subsequent subsurface excavation was carried out on the site by Wheeler *et al.* (2003). In addition monitoring of selected locations was undertaken by representatives of the Bega Traditional Aboriginal Elders Council.

The subsurface work conducted at the school site revealed the presence of stone artefacts, shell midden and ochre within relatively intact soil profiles. Stone artefacts were found to be present in comparatively high densities representing tool maintenance and knapping activities. Raw materials utilised for stone working included silcrete, rhyolite and quartz. Backed artefacts dominated the 'finished implement' type and the analysis of material showed that blades were manufactured on site. The materials excavated led Wheeler *et al.* (2003) to conclude that the site is large, complex and repeatedly occupied.

Kuskie (2004) reports the salvage of a shell midden and artefact scatter site (MC7/A) identified by representatives of Bega Traditional Aboriginal Elders Council during a monitoring program of the Merimbula Cove Residential Development site. The MC7/A site was found on a ridge crest; in addition a further small shell midden (MC6/A) and an isolated artefact (MC6/B) was found on a simple slope.

Site MC6/A was found to contain in situ shell midden to a depth of 12 cm. In addition two stone artefacts and several pieces of bone and charcoal were retrieved. The midden, dominated by cockle (*Anadara trapezia*), was of a circular shape measuring 1.5 m in diameter. Mud oyster, mud whelk and edible mussel were also present but in lower frequencies. A single cockle shell was radiocarbon dated to 1192 ± 30 years BP, equating to a calibrated age of 910-620 cal BP [Radiocarbon Date Number Wk14112] (Kuskie 2004).

Surface collection of stone artefacts and minor excavation by trowel of one midden locus was conducted at Site MC7/A. Of the forty seven stone artefacts recorded, banded rhyolite was found to dominate the assemblage, however silcrete was also present in moderate frequency. Flaking debitage dominated the artefact types, however the presence of one microblade and two microblade cores indicated on-site microblade technology. A single geometric microlith was retrieved from the *in situ* midden. Shell from that deposit was radiocarbon dated to 807 ± 30 years BP (equating to an age calibration of 540-290 cal BP) [Radiocarbon Date Number Wk14110]. As Kuskie (2004) notes, this is a rarely documented finding in the south east, and strongly suggests the continuation of microblade technology into the recent past (however, cf Boot 2002).

Dibden (2004) conducted a survey of the proposed Mirador subdivision area situated north of Back Lagoon in the area previously surveyed by Aiken (1986), Lance (1987) and Williams (1998). The artefact scatter previously identified by Aiken and Lance was relocated and found to be an extensive, but low density scatter on a spur landform. The site previously found by Williams (1998) was relocated and found to have been recently disturbed by earth works.

ERM (2004) conducted a survey of an area measuring 20 square meters for a proposed sewage treatment plant at Tura Beach. A scatter of four stone artefacts was recorded.

Dibden (2005) conducted a survey at Millingandi in response to a caravan park redevelopment. The area was located adjacent to Merimbula Lake and included an elevated flat landform (Tertiary) and bedrock slopes. A number of stone artefacts were recorded in ground exposures. A subsequent program of subsurface test excavation was undertaken revealing a high density and consistent distribution of stone artefacts across the entire area (Dibden 2006).

7.4 Archaeological Potential of the Proposal Area

Based on the above review and a consideration of the landscape context of the investigation area the type of sites known to occur in the region and the potential for their presence within the study area are listed as follows.

Stone Artefacts

Stone artefacts are found either on the surface and/or in subsurface contexts. The raw materials used for artefact manufacture will commonly be silcrete, chert, quartzite, quartz and volcanics.

Within the local area stone artefacts will be widely distributed across the landscape in a virtual continuum, but with significant variations in density in relation to different environmental factors. Artefact density and site complexity is likely to be greater near reliable water (c. 100 metres of the highest order streams and fresh water swamps) and the confluence of a number of resource zones.

The detection of stone artefacts depends on ground surface factors and whether or not the potential archaeological bearing soil profile is visible. Prior ground disturbance, vegetation cover and sediment/gravel deposition can act to obscure the presence of stone artefacts.

Given the environmental context of the proposal area and a prediction of the likely nature of Aboriginal landuse, stone artefacts can generally be expected to be present in very low or low densities.

Middens

Middens consist of deposits of shell and sometimes contain stone artefacts, bone and human burials. Middens are a commonly recorded site type in the local area.

Middens situated in the area will vary in their species composition which is generally a factor of environmental location. Rock platform species typically dominate sites situated on headland contexts, while estuarine species are dominant in sites found around estuaries.

Given the environmental context of the proposal area the potential for middens to be present is assessed to be low.

Grinding Grooves

Grinding grooves are found in rock surfaces and result from the manufacture and maintenance of ground edge tools. Given the absence of large sandstone exposures within any of the proposal areas, it is unlikely that this site type will be present.

Burials sites

Burial sites have been recorded within the wider region. The potential exists for burials to be present in coastal Holocene sand bodies. However, burials are generally only visible in areas where the deposit has been disturbed either by natural erosion or human activity. This site type is unlikely to be present given the nature of the soils.

Rock Shelter Sites

Rock shelter sites consist of any form of rock overhang that contains artefacts and/or art. Common archaeological features of rock shelter sites are: surface artefacts, occupation deposit such as stone artefacts, shell, bone and charcoal, rock drawings, paintings and stencils, engraved imagery, potential archaeological deposit and grinding grooves.

Given the absence of large vertical stone exposures in the proposal areas this site type is unlikely to be recorded.

Scarred and Carved Trees

Scarred and Carved trees result from either domestic or ceremonial bark removal. Carved trees associated with burial grounds and other ceremonial places have been recorded in the wider region. In an Aboriginal land use context this site type would most likely have been situated on flat or low gradient landform units in areas suitable for either habitation and/or ceremonial purposes.

Bark removal by European people through the entire historic period and by natural processes such as fire blistering and branch fall make the identification of scarring from a causal point of view very difficult. Accordingly, given the propensity for trees to bear scarring from natural causes their positive identification is impossible unless culturally specific variables such as stone hatchet cut marks or incised designs are evident and rigorous criteria in regard to tree species/age/size and specific characteristics in regard to regrowth is adopted.

Nevertheless, the likelihood of trees bearing cultural scarring remaining extant and in situ is low given events such as land clearance and bushfires. Generally scarred trees will only survive if they have been carefully protected (such as the trees associated with Yuranigh's grave at Molong where successive generations of European landholders have actively cared for them).

There is some potential for this site type to be recorded during the current project.

Stone Quarry and Procurement Sites

A lithic quarry is the location of an exploited stone source (Hiscock & Mitchell 1993:32). Sites will only be located where exposures of a stone type suitable for use in artefact manufacture occur. Given the absence of suitable stone outcrops in the proposal areas this site type is unlikely to be recorded during the study.

8. SURVEY RESULTS

8.1 Survey Results

Four survey units were defined in the study area. These areas are described in Table 1 and their location is shown in Figure 4. No Aboriginal objects were recorded during the survey and the study area is assessed to be of very low to low archaeological sensitivity.

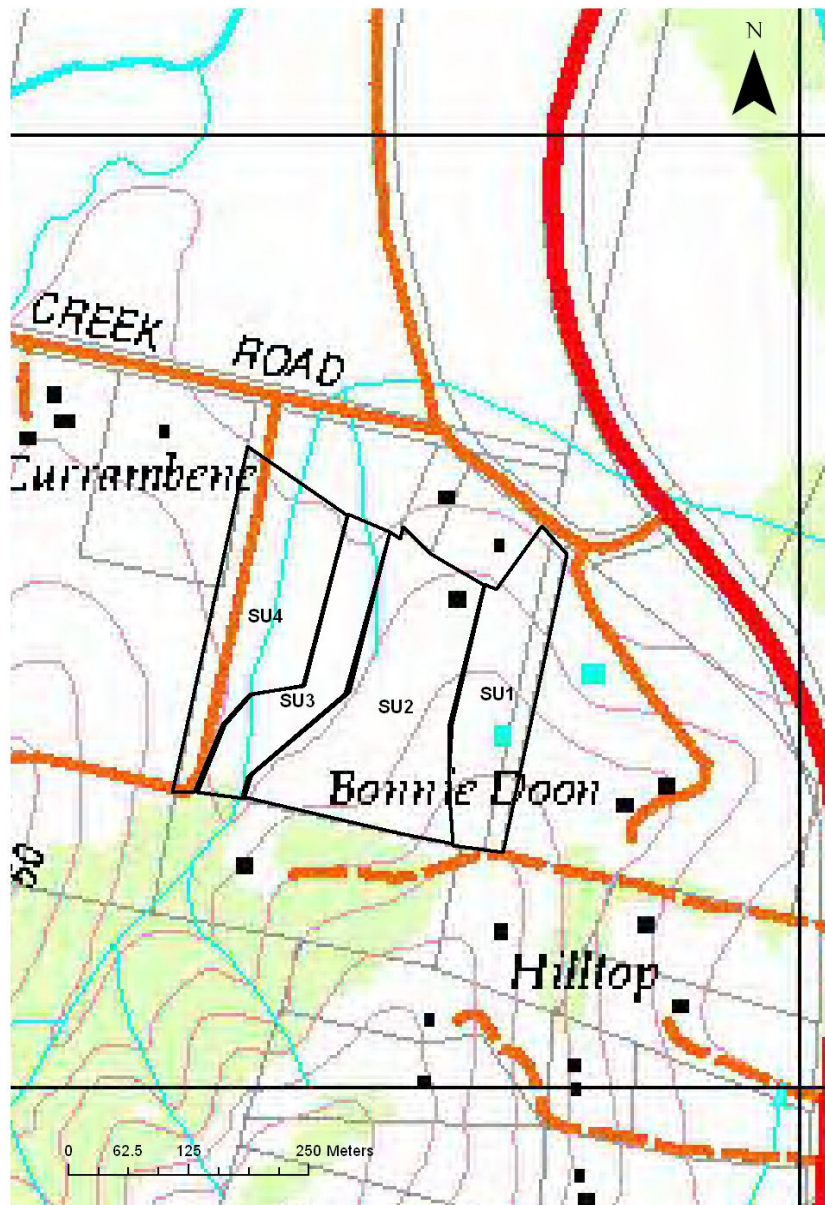


Figure 4. Location of Survey Units.

The total Survey Unit area measured 10.9 hectares. It is estimated that approximately 6.4 hectares of that area was subject to survey inspection, focusing on areas of ground exposure. Ground exposures inspected are estimated to have been 0.4 hectares in area. Of that ground exposure area archaeological visibility (the potential artefact bearing soil profile) is estimated to

have been 0.13 hectares. Effective Survey Coverage is therefore calculated to have been 1.2% of the proposal area.

Survey Unit	Description: landform; vegetation prior impacts	SU Area sq m	Ground exposure %	Ground exposure sq m	Archaeological visibility %	Net Effective Exposure sq m	Effective Survey Coverage %	Subsurface potential: (predicted artefact density)
SU1 (Plate 1)	Crest with moderate gradient and northerly aspect; Cleared, grasses; House, shed, dam, driveway, transmission line, fencing and landscaping	23070	7	1614.9	40	645.96	2.8	Very low
SU2 (Plate 2)	Simple slope with moderate gradient and westerly aspect; Cleared, grasses with very sparse eucalypts; Shed, driveway, dam, fencing	40437	4	1617.5	35	566.12	1.4	Very low
SU3 (Plate 3)	Drainage depression with very gentle gradient and northerly aspect; Cleared, grasses with very sparse eucalypts; Landscaped, fencing	16730	1	167.3	25	41.83	0.3	Very low
SU4 (Plate 4)	Simple slope with very gentle gradient and easterly aspect; Cleared, grasses with sparse eucalypts and wattles; Graded road, fencing, electricity power line	29556	1	295.6	15	44.33	0.2	Low
Total		109793 (10.979 ha)		3695.2 (0.4 ha)		1298.24 (0.13 ha)	1.2 %	

Table 1. Survey Unit description and Effective Survey Coverage.

The overall effective survey coverage achieved during the field assessment is relatively low. Nevertheless, there were significant areas of localised ground exposure in areas of mechanical disturbance and bare earth patches where there was breaching of potential artefact bearing deposits, particularly in Survey Units 1 and 2. Survey coverage was less effective in Survey Units 3 and 4 as the result of less breaching of the ground surfaces and a more consistent grass cover.

However, the predictive model for artefact distribution in the proposal area, which was an open woodland at some distance from a perennial water source, indicates that it would be expected to contain artefacts at a low to very low distribution. Given the absence of a reliable fresh water source in the study area it is predicted that the area was not subject to sustained Aboriginal habitation. Aboriginal habitation sites are expected to be present in closer proximity to permanent watercourses and a confluence of resource zones. It is predicted that the land occupied by the study area itself is likely to have been utilised for hunting and gathering forays away from base camps. Such short term events are unlikely to result in the formation of large, high density

or complex archaeological sites. It is predicted instead that such land usage would result in low levels of artefactual discard.

Based on a consideration of the predictive model applicable to the study area and an analysis of the results of the field survey coverage achieved during the inspection it is concluded that the proposal area is of low archaeological sensitivity. It is therefore considered that the proposed development is unlikely to cause impacts to any Aboriginal objects or archaeological deposits of significance.



Plate 1. Survey Unit 1 looking north.



Plate 2. Survey Unit 2 looking south.



Plate 3. Survey Unit 3 looking south.



Plate 4. Survey Unit 4 looking northwest.

9. STATUTORY INFORMATION

Two pieces of legislation provide the primary basis for Aboriginal heritage management in NSW; the National Parks and Wildlife Act 1974 (NPW Act) and the Environmental Planning and Assessment Act 1979 (EP&A Act) (NPWS 1997).

The *Environmental Planning and Assessment Act 1979* (EP&A Act), its regulations, schedules and guidelines provides the context for the requirement for environmental impact assessments to be undertaken during land use planning (NPWS 1997).

The proposed subdivision is defined as a Major Project under Part 3A of the Environmental Planning and Assessment Act 1979.

Part 3A of the Environmental Planning and Assessment Act 1979

The Part 3A consolidates the assessment and approval regime for all major developments which previously were addressed under Part 4 (Development Assessment) or Part 5 (Environmental Assessment).

Part 3A applies to all major State government infrastructure projects, developments previously classified as State significant and other projects, plans or programs of works declared by the Minister. The amendments aim to provide a streamlined assessment and approvals regime and also to improve the mechanisms available under the EP&A Act to enforce compliance with approval conditions of the Act.

Under the terms of Part 3A of the Environmental Planning and Assessment Act 1979 the following authorizations are not required for an approved project (and accordingly the provisions of an Act that prohibit an activity without such an authority do not apply):

- a permit under section 87 or a consent under section 90 of the *National Parks and Wildlife Act 1974*;
- an approval under Part 4, or an excavation permit under section 139, of the *Heritage Act 1977*.

10. MITIGATION AND MANAGEMENT STRATEGIES

The aim of this study has been to identify Aboriginal objects and to predict the archaeological potential within each Survey Unit, to assess site significance and thereafter, to consider the potential impact of the proposal upon this heritage. It is noted that **no** Aboriginal objects were recorded during the field survey. It is however predicted that stone artefacts are likely to be present in each survey unit in either very low or low densities.

10.1 Impact Assessment

No Aboriginal objects were located during the field survey. Furthermore the Survey Units are each assessed to be of low archaeological sensitivity; *that is* – artefact density of any subsurface deposit is predicted to be either very low or low. The archaeological significance of any unrecorded Aboriginal objects is predicted to be low.

The subdivision will cause physical impacts to any Aboriginal objects which may be located within direct impact areas - *irrespective of their significance*; any Aboriginal object situated within an area of impact will be comprehensively disturbed and/or destroyed during subdivision construction.

As with any development the chances of impacting Aboriginal objects, particularly stone artefacts, is high given that they are present in a continuum across the landscape and located on or within ground surfaces. However in regard to Aboriginal objects such as low density artefact distributions which are assessed to be of low significance, proposed impacts can be viewed as being of correspondingly low significance. This assessment forms the basis for the formulation of recommendations ensuing from the assessment. It is concluded that the development impact to any Aboriginal objects present will be of low significance.

In the following section a variety of strategies that can be considered for the mitigation and management of development impact to each Survey Units are listed and discussed.

10.2 Management and Mitigation Strategies

Further Investigation

The field survey has been focused on recording artefactual material present on visible ground surfaces. Further archaeological investigation would entail subsurface excavation for the purposes of identifying the presence of artefact bearing soil deposits and their nature, extent, integrity and significance.

Further archaeological investigation in the form of subsurface test excavation can be appropriate in certain situations. Such situations generally arise when a proposed development is expected to involve ground disturbance in areas which are assessed to have potential to contain moderate or high density artefactual material, when the Effective Survey Coverage achieved during a survey is low and/or when the artefactual status of landforms cannot be reliably predicted.

No Survey Units have been identified in the proposal area to warrant further archaeological investigation in order to formulate appropriate management and mitigation strategies. Based on a consideration of the reliability of the local predictive model of site type and location, the archaeological potential of the proposal area can be dependably predicted; it is considered that in regard to the archaeology itself, subsurface testing is unlikely to produce results much different to predictions made in respect of the subsurface potential of these landforms.

Conservation

Conservation is a suitable management option in any situation however, it is not always feasible to achieve. Such a strategy is generally adopted in relation to sites which are assessed to be of high cultural and scientific significance, but can be adopted in relation to any site type.

When conservation is adopted as a management option it may be necessary to implement various strategies to ensure Aboriginal object locales are not inadvertently destroyed or disturbed during construction works or within the context of the life of the development project. Such procedures are essential when development works are to proceed within close proximity to identified sites.

It is assessed that the archaeological resource in the proposal area does not surpass significance thresholds which would preclude impacts. In the case at hand, avoidance of impacts to the predicted very low or low density subsurface artefact distributions is not considered to be warranted.

Mitigated Impacts

Mitigated impact usually takes the form of partial impacts only (ie conservation of part of an Aboriginal artefact locale or Survey Unit) and/or salvage in the form of further research and archaeological analysis prior to impacts. Such a management strategy is generally appropriate when Aboriginal objects are assessed to be of moderate or high significance to the scientific and/or Aboriginal community and when avoidance of impacts and hence full conservation is not feasible. Salvage can include the surface collection or subsurface excavation of Aboriginal objects and subsequent research and analysis.

In the case at hand, a program of impact mitigation to the predicted very low or low density subsurface artefact distributions is not considered to be warranted.

Unmitigated Impacts

Unmitigated impact to Aboriginal objects can be given consideration when they are assessed to be of low archaeological and cultural significance and otherwise in situations where conservation is simply not feasible.

Given the prediction that any subsurface artefacts in the proposal area will be distributed in very low or low density unmitigated impact is considered appropriate.

11. RECOMMENDATIONS

The following recommendations are made on the basis of:

- The results of the investigation as documented in this report.
- Consideration of the type of development proposed and the nature of the proposed impacts.
- Consultation with Ben Cruise, Eden Local Aboriginal Land Council.

Conclusions and recommendations are listed as follows:

1. No Aboriginal objects were recorded in the study area during the field survey. The proposal area is assessed to be of low archaeological sensitivity. Accordingly there are no constraints relating to the proposed impacts.
2. No further archaeological investigations are considered necessary in regard to the proposal.

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