INYADDA DRIVE, MANYANA, NSW

Aboriginal Cultural Heritage Assessment Report

Report to Heir Asquith Pty Ltd and Manyana Project Pty Ltd

Shoalhaven LGA

August 2023

APEX ARCHAEOLOGY

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ABN 56 625 618 993

EXECUTIVE SUMMARY

Apex Archaeology have been engaged to assist Heir Asquith Pty Ltd (the proponent) and Manyana Project Pty Ltd (the landowner) to undertake an Aboriginal Cultural Heritage Assessment (ACHA) to inform an Integrated Development Application (IDA) for the development of land on Inyadda Drive, Manyana, for residential and environmental conservation purposes.

This ACHA has been prepared in accordance with the *Guide to investigating, assessing and reporting on Aboriginal cultural heritage in NSW* (April 2011); the *Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010* (DECCW, April 2010) (the ACHCRs); and the *Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales* (September 2010) (the Code of Practice). It details the results of the archaeological assessment completed in accordance with the Code of Practice and the consultation undertaken with the Aboriginal community in accordance with the ACHCRs.

The project is located within the Shoalhaven City Council (SCC) area. The study area is located just north of the township of Manyana and is legally defined as Lot 2 DP 1161638, Lot 106 DP 755923 and Lot 2 DP 1121854. It covers an area of approximately 77.5 hectares and is bound by Inyadda Drive to the west, existing residential properties to the south, undeveloped land to the north, and public recreational land between the site and the ocean to the east. The investigation area comprises the development area excluding the strip adjacent to the watercourse within the western portion of the study area.

Initially, Apex Archaeology were commissioned to prepare this report to support a proponent initiated Planning Proposal for the rezoning of the site. Subsequently, the proponent elected to discontinue this process and lodge a DA in line with the current zoning of the site. This report has subsequently been updated to reflect the amended application process.

The Development Application seeks consent for a 65-lot residential subdivision including the following:

- Lot 1 – 57.53ha Community title lot for biodiversity protection purposes;
- Lots 2-66 Torrents title residential lots ranging in size form 2000m^2 to 2840m^2;
- Lot 67 – Proposed public reserve for a local park (2088m^2) containing grave site to be dedicated to Council;
- Lot 68 – Proposed RE1 Open Space Lot (3054m^2) to be acquired by Council;
- Creation of a timber pedestrian accessway over Lot 1;
- Creation of a 6m wide fire trail including a beach access trail;
- Creation of a 6m wide drainage easement;
- Construction of an 8m wide pavement for emergency purposes with restricted access to Curvers Drive;
- Road Construction and dedication including intersection treatments to existing public roads;

- Indicative Building Envelope Plans in order to protect hollow-bearing trees where possible;
- Asset Protection Zones;
- Tree removal within the development footprint;
- Bulk earthworks to facilitate building platforms;
- Culvert upgrades on Inyadda Drive for flood free access;
- Retaining walls around perimeter road;
- Stormwater and Water Quality works including swales in the road reserve;
- Street tree planting; and
- Proposed sewer servicing scheme including pump out system.

The area to be established as a community lot is proposed to be managed by a community association. This area is also a biodiversity area which must be protected. A Community Plan of Management (PoM) will be developed subsequent to the issue of the DA and is anticipated to be a condition of consent prior to the commencement of construction. This will guide the management of the community lot, including protection of heritage sites located within the community lot. As the area is designated for biodiversity conservation, minimal impact would occur within this lot. Proposed wording for the management of Aboriginal cultural heritage sites within the community lot has been prepared and attached as an appendix to this report. This wording should be included in the Community PoM.

Consultation with the RAPs has been conducted in accordance with the Consultation Guidelines. A total of three Aboriginal people and organisations registered an interest in being consulted for the project. The following list comprises the registered Aboriginal parties (RAPs) for the project:

- Goobah Developments
- Jerrinja LALC
- Woronora Plateau Gundangara Elders Council

Consultation with the Aboriginal community has been maintained at least every six months as part of this assessment.

A number of previous archaeological assessments have been undertaken for the site, covering both Aboriginal and non-Indigenous heritage. As part of these assessments, a number of Aboriginal sites within the area have been identified, comprising both artefact scatters and potential archaeological deposits (PAD). A total of six AHIMS site are located within the study area, as follows:

- 58-2-0337
- 58-2-0338
- 58-2-0339
- 58-2-0396
- 58-2-0340
- 58-2-0341

An additional site (58-2-0241) is located immediately adjacent to the eastern boundary but outside of the study area, and would not be impacted by the proposed development.

The further investigation of these sites through a program of test excavations was recommended by previous consultants, in order to determine the nature and extent of these deposits within the site; although it is noted that previous assessments have identified significant disturbance within the site. Apex Archaeology were engaged to undertake the required archaeological assessment for the site, including test excavations within areas considered to have archaeological potential.

The study area has been considerably disturbed through public access to the area since at least the 1970s. The area has been used for motorbike and 4WD use, with multiple tracks and trails created throughout the area. Substantial illegal dumping of rubbish, building waste (bricks, bottles, garden waste, tiles, asbestos etc), excavation of soil and dumping of soils has occurred throughout much of the western portion of the study area, along with dumping of wrecked car bodies in numerous locations throughout the entirety of the study area. These actions have disturbed the ground surface significantly within the area considered to be PAD.

Further, some of the area included within the PAD was reassessed as being a swamp area and unlikely to have been used as a habitation area, although it may have been accessed for food resources. The areas of PAD within the study area were reassessed as part of this assessment and were generally smaller than those identified previously; partly due to impact during the intervening years causing significant impact to the land surface, and partially based on landform assessment. This was also based on consideration of the site survey results.

Test excavations were undertaken in September 2021 within the area delineated as PAD, focussed on the proposed development area in the eastern portion of the site. No testing was undertaken within the proposed Community Title lot as there is minimal proposed impact within this area, as it will be retained for conservation purposes; although it is noted that there are surface archaeological deposits present within this area.

A total of 36 50 x 50cm test pits were excavated across the area considered to have potential for subsurface deposits to be present, with four of these expanded into 1m^2 test pits due to artefact numbers; resulting in a total of 48 50 x 50cm test pits excavated. A total of 42 artefacts were recovered from the test excavations, with 32 recovered from the initial test pits and a further 10 recovered from the expansion pits.

The majority of the items recovered were located along the top of the spur which runs east-west through the study area. The artefacts were generally located in the upper 10cm of deposit, although a few were noted to be located at up to 20cm depth. However, this was considered likely to have been related to the widespread disturbance across the site leading to churning of the deposit, rather than intact stratigraphy.

Based on the results of the cultural heritage and archaeological assessments, the following recommendations have been made for the project:

Recommendation 1: AHIP Application Required

Aboriginal cultural material is present within the study area in a highly disturbed context. The development area was not assessed as possessing intact areas with potential for Aboriginal cultural material or deposits to be present. The proposed development does not avoid all the Aboriginal cultural material within the site and thus an application for an Aboriginal Heritage Impact Permit (AHIP) is required to permit harm to these items, namely sites 58-2-0337 and 58-2-0341.

Recommendation 2: Surface Collection

Due to the nature of the archaeological deposit within the proposed development area, appropriate mitigation measures have been proposed. A two staged surface collection process for sites 58-2-0337 and 58-2-0341 is recommended, as follows:

- Undertake collection of surface artefacts visible across the proposed impact area/s within the study area.
- Clearing of vegetation within the proposed development impact area is completed, in line with the project approval; along with initial grading of the fire trail/beach access on the southern boundary.
- A second collection of surface artefacts is undertaken across the exposed areas to collect any additional cultural material which becomes visible as part of these works.
- Following analysis and cataloguing, artefacts are reburied on site within an area proposed for conservation.
- No further archaeological excavation work is recommended for the site due to the level of disturbance present.

Recommendation 3: Avoid Impact to Sites Outside Development Area

Four of the six Aboriginal sites within the proposed development area can be avoided by the proposed development works; namely sites 58-2-0340, 58-2-0338, 58-2-0339 and 58-2-0396. Protection for these sites should be written into any Environmental Management Plan/Community Plan of Management prepared for the management of the ecological values of these areas. The areas will be located within land established as a community title lot for biodiversity protection. Provision for the protection of these sites should be included in any management documents for the site to ensure they are protected into the future.

Recommendation 4: Maintain Aboriginal Community Consultation

Consultation with the RAPs regarding the project should continue, in order to keep the RAPs informed about the management of Aboriginal cultural heritage within the study area. This includes notifying the RAPs when an AHIP application is lodged, and also in the event an AHIP is issued.

Recommendation 5: Development Boundaries

The proposed development works must be contained within the assessed boundaries for this project – ie the proposed development boundary. If there is any alteration

to the boundaries of the proposed development to include areas not assessed as part of this archaeological investigation, further investigation of those areas may be necessary to assist in appropriately managing Aboriginal objects and places which may be present.

Recommendation 6: Stop Work Provision

Should unanticipated Aboriginal archaeological material be encountered during site works after the recommended mitigation measures have been completed in accordance with an approved AHIP, all work must cease in the vicinity of the find and an archaeologist contacted to make an assessment of the find and to advise on the course of action to be taken. Further archaeological assessment and Aboriginal community consultation may be required prior to the recommencement of works. Any objects confirmed to be Aboriginal in origin must be reported to Heritage NSW.

In the unlikely event that suspected human remains are identified during construction works, all activity in the vicinity of the find must cease immediately and the find protected from harm or damage. The NSW Police and the Coroner's Office must be notified immediately. If the finds are confirmed to be human and of Aboriginal origin, further assessment by an archaeologist experienced in the assessment of human remains and consultation with both Heritage NSW and the RAPs for the project would be required.

This recommendation should be included in any Construction Environmental Management Plan (CEMP) developed for the site.

Recommendation 7: Reporting

One digital copy of this report should be forwarded to Heritage NSW to support the required AHIP application for the project, along with required supporting documentation.

One digital copy of this report should be forwarded to Heritage NSW for inclusion on the Aboriginal Heritage Information Management System (AHIMS).

One copy of this report should be forwarded to each of the registered Aboriginal stakeholders for the project.

Apex Archaeology acknowledges and pays respect to the past, present and future Traditional Custodians and Elders of this nation and in whose land this assessment took place, and to the continuation of cultural, spiritual and educational practices of Aboriginal and Torres Strait Islander peoples.

Document Control

The following register documents the development and issue of the document entitled 'Inyadda Drive, Manyana, NSW: Aboriginal Cultural Heritage Assessment Report', prepared by Apex Archaeology in accordance with its quality management system.

Revision	Prepared by	Reviewed by	Issue Date
1 – Draft	Jenni Bate	Leigh Bate	31 October 2021
2 – Draft	Jenni Bate	SCC	5 November 2021
3 – Final	Jenni Bate	RAPs	13 December 2021
4 – Final	Jenni Bate	Calibre Group	14 September 2022
5 – Final	Jenni Bate	Calibre Group	10 August 2023

GLOSSARY OF TERMS

Aboriginal Object	An object relating to the Aboriginal habitation of NSW (as defined in the NPW Act), which may comprise a deposit, object or material evidence, including Aboriginal human remains.
ACHA	Aboriginal Cultural Heritage Assessment
ACHAR	Aboriginal Cultural Heritage Assessment Report
AHIMS	Aboriginal Heritage Information Management System maintained by Heritage NSW, detailing known and registered Aboriginal archaeological sites within NSW
AHIP	Aboriginal Heritage Impact Permit
ASIRF	Aboriginal Site Impact Recording Form
BP	Before Present, defined as before 1 January 1950.
Code of Practice	The DECCW September 2010 *Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales*
Consultation	Aboriginal community consultation in accordance with the DECCW April 2010 *Aboriginal cultural heritage consultation requirements for proponents 2010.*
DA	Development Application
DECCW	The Department of Environment, Climate Change and Water (now Heritage NSW)
Disturbed Land	If land has been subject to previous human activity which has changed the land's surface and are clear and observable, then that land is considered to be disturbed
DPIE	Department of Planning, Industry and Environment
Due Diligence	Taking reasonable and practical steps to determine the potential for an activity to harm Aboriginal objects under the *National Parks and Wildlife Act 1974* and whether an application for an AHIP is required prior to commencement of any site works, and determining the steps to be taken to avoid harm
Due Diligence Code of Practice	The DECCW Sept 2010 *Due Diligence Code of Practice for the Protection of Aboriginal Objects in New South Wales*
GIS	Geographical Information Systems
GSV	Ground Surface Visibility
Harm	To destroy, deface or damage an Aboriginal object; to move an object from land on which it is situated, or to cause or permit an object to be harmed
Heritage NSW	Heritage NSW within the Department of Premier and Cabinet; responsible for overseeing heritage matters within NSW
ka	Kiloannus, a unit of time equating to 1,000 years
LALC	Local Aboriginal Land Council
LGA	Local Government Area
NPW Act	NSW *National Parks and Wildlife Act* 1974
NPWS	National Parks and Wildlife Service
OEH	The Office of Environment and Heritage of the NSW Department of Premier and Cabinet (now Heritage NSW)
PAD	Potential Archaeological Deposit
PoM	Plan of Management
RAPs	Registered Aboriginal Parties
SCC	Shoalhaven City Council

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APPENDICES

FIGURES

1.0 Introduction

Apex Archaeology have been engaged to assist Heir Asquith Pty Ltd (the proponent) and Manyana Project Pty Ltd (the landowner) to undertake an Aboriginal Cultural Heritage Assessment (ACHA) to inform the proposed development of land on Inyadda Drive, Manyana, for residential and environmental conservation purposes.

This ACHA has been prepared in accordance with the *Guide to investigating, assessing and reporting on Aboriginal cultural heritage in NSW* (April 2011); the *Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010* (DECCW, April 2010) (the ACHCRs); and the *Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales* (September 2010) (the Code of Practice). It details the results of the archaeological assessment completed in accordance with the Code of Practice and the consultation undertaken with the Aboriginal community in accordance with the ACHCRs.

1.1 Study Area and Project Brief

The project is located within the Shoalhaven City Council (SCC) area. The study area is located just north of the township of Manyana and is legally defined as Lot 2 DP 1161638, Lot 106 DP 755923 and Lot 2 DP 1121854. It covers an area of approximately 77.5 hectares and is bound by Inyadda Drive to the west, existing residential properties to the south, undeveloped land to the north, and public recreational land between the site and the ocean to the east.

A significant proportion of the proposed development area is affected vegetation communities listed under the Environment Protection and Biodiversity Conservation (EPBC) Act. It was initially proposed to rezone the land to amend the lot sizes within the study area, but this proposal has subsequently been discontinued and the proponent has elected to submit a development application (DA) to support creation of residential lots in line with the current zoning for the site. This report was initially prepared to support the rezoning Planning Proposal but has subsequently been updated to inform the DA, which is an Integrated Development Application (IDA), for the site.

1.2 Objectives of the Aboriginal Cultural Heritage Assessment

The archaeological investigation was undertaken to meet the requirements of the Code of Practice and ACHCRs.

The purpose of the archaeological investigation is to understand and establish the potential harm the proposed development may have on Aboriginal cultural heritage within the study area, both tangible and intangible.

Aboriginal community consultation was undertaken for the project with the aim of:

- Identifying the Aboriginal community members who can speak for Country within which the study area is located;
- Involving the Aboriginal community in making decisions about the management of their cultural heritage;
- Identifying, assessing and recording Aboriginal heritage values within the study area;
- Preparing an assessment of the cultural heritage values in consultation with the Aboriginal community;
- Identifying the potential impact of the proposed development on the assessed cultural heritage values; and
- Developing conservation and mitigation strategies for these values, with the aim of minimising impacts to cultural heritage wherever possible.

In addition, this report provides a significance assessment of the identified Aboriginal heritage values, as defined by the registered Aboriginal stakeholders (RAPs) for the project. Aboriginal people are the primary determinants of the significance of their cultural heritage and therefore Apex Archaeology cannot make a determination on the cultural significance without the input of the RAPs.

Any development works which disturb the ground surface have the potential to impact Aboriginal archaeological deposits and therefore an assessment of whether the study area contains such deposits is required prior to the commencement of construction works. An assessment of whether the proposed development would impact these deposits (if present) is also necessary, and identification of to what extent the deposits would be impacted is also required. The degree of impact which may be allowable is determined, in part, with consideration of the level of cultural significance attributed to the cultural values of the study area, both tangible and intangible.

1.3 Project Proponent

The proponent for the project is Heir Asquith Pty Ltd. The original SCC contact for the project was Eric Hollinger. As SCC is no longer progressing the proponent initiated Planning Proposal for the study area, with the proponent instead lodging an IDA directly, the subsequent client representative is Jessica Head of Calibre Group.

1.4 Investigators and Contributors

This archaeological assessment was initially commissioned by SCC. Apex Archaeology thanks Eric Hollinger of SCC for his assistance with the majority of the project. Thanks also go to Jessica Head of Calibre Group and Rose O'Sullivan and Emily Dillon of Heritage NSW for their advice regarding the project. Thanks are also extended to the registered Aboriginal groups for their participation and assistance with the project.

This report has been prepared by Jenni Bate, Director and Archaeologist with Apex Archaeology. The report was reviewed by Leigh Bate, Director and Archaeologist with Apex Archaeology. Both Jenni and Leigh have over fifteen years of archaeological consulting experience within NSW. Bonnie Clark assisted with test excavations within the site and Dr Beth White undertook the lithic analysis. Project team roles and qualifications are shown in Table 1.

Table 1: Project team roles and qualifications

Name	Role	Qualifications
Jenni Bate	Project Manager; Report Author; Field Inspection; Review	B.Archaeology; Grad. Dip. CHM
Leigh Bate	Field inspection; Test Excavation; Report Author; Review; GIS	B.Archaeology; Grad. Dip. Arch; Dip. GIS
Bonnie Clark	Archaeological Assistant	B.Arch.Prac(Hons); PhD Evol.Bio (Palaeoanthropology)
Beth White	Archaeologist/Lithic Specialist	BA(Hons); MPhil; PhD; MAACAI

1.5 LIMITATIONS

This report relies in part on previously recorded archaeological and environmental information for the wider region. This includes information from AHIMS, which is acknowledged to be occasionally inaccurate, due to inaccuracies in recording methods. No independent verification of the results of external reports has been made as part of this report.

Field investigations for this report included survey and test excavation. The results are considered to be indicative of the nature and extent of Aboriginal archaeological remains within the study area, but it should be noted that further Aboriginal objects and sites which have not been identified as part of this assessment may be present within the wider study area, although it is considered unlikely.

It is recognised that Aboriginal people are the primary determinants of the significance of their cultural heritage, and as such, Apex Archaeology have relied on the Aboriginal community to provide cultural knowledge regarding the site, where they are willing and able to share such knowledge. However, there may be occasions where RAPs are unwilling or unable to share cultural knowledge regarding the site and thus our assessment of significance relies on scientific assessment only.

This report assesses Aboriginal cultural heritage matters only. No assessment of historical heritage has been made as part of this ACHA.

1.6 Report Structure

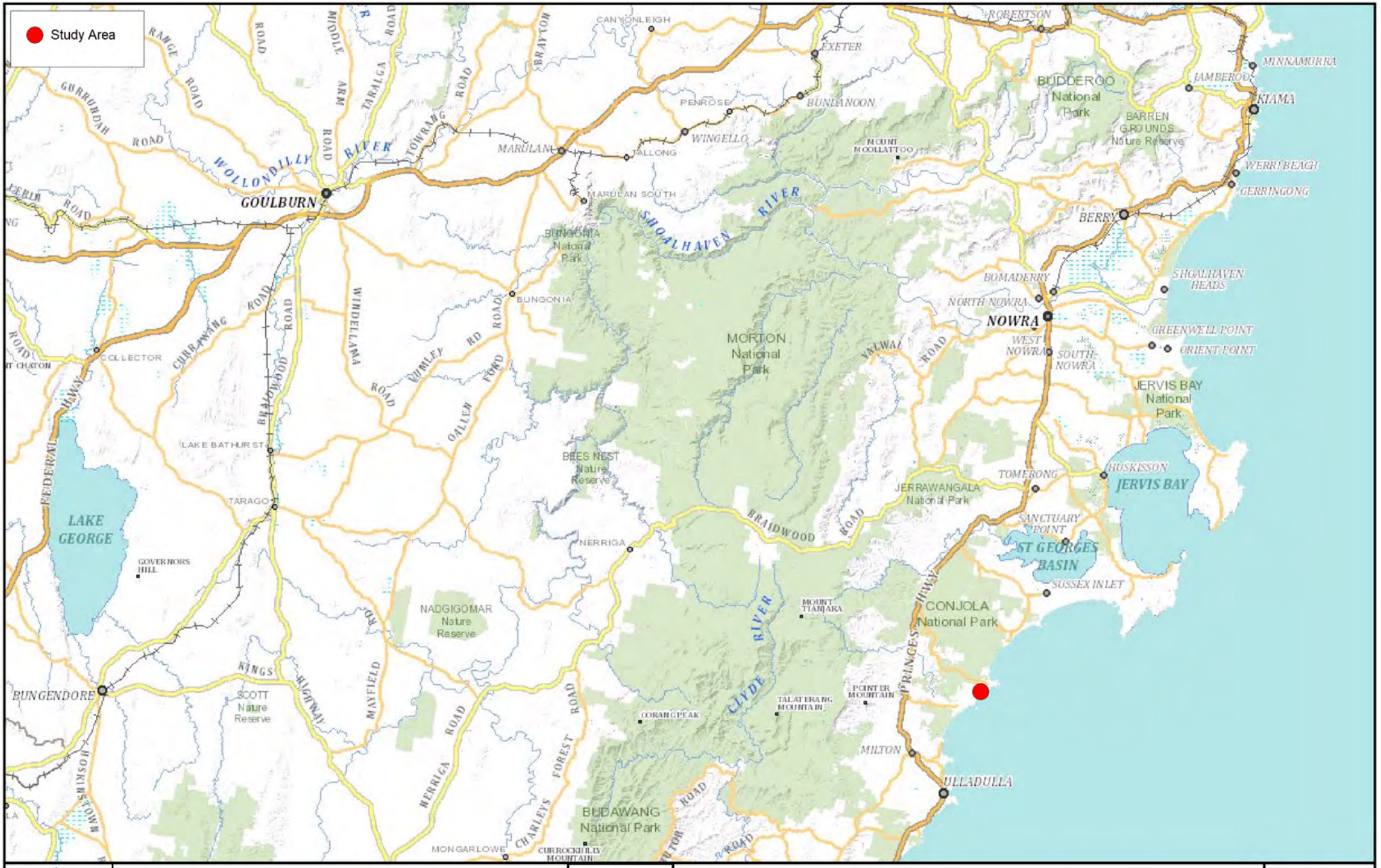
This report addresses the requirements of the *Guide to Investigating, Assessing and Reporting on Aboriginal Cultural Heritage in NSW* (The Guide), the Code of Practice and the ACHCRs. The Guide provides guidance as to what must be contained in an ACHAR. The following tables outline the requirements of both the Guide and the Code of Practice, and how they have been addressed in this report. It is acknowledged that generally an ACHAR and a separate Archaeological Technical Report (ATR) would be prepared for a project; in this instance Heritage NSW advised that combining the information in one consolidated report was acceptable.

Table 2: Required contents of an ACHAR and where met in this report

Report requirements	Where met
Description of the Aboriginal objects and declared Aboriginal places located within the area of the proposed activity	Section 4.4
Description of the cultural heritage values, including the significance of the Aboriginal objects and declared Aboriginal places, that exist across the whole area that will be affected by the proposed activity	Section 7
The significance of the above values for the Aboriginal people who have a cultural association with the land	Section 7.3
How requirements for consultation with Aboriginal people have been met (as specified in clause 80C of the NPW Regulation)	Section 3
The views of those Aboriginal people regarding the likely impact of the proposed activity on their cultural heritage	Section 3; Section 7.3
Actual or likely harm posed to the Aboriginal objects or declared Aboriginal places from the proposed activity, with reference to the cultural heritage values identified	Section 8
Any practical measures that may be taken to protect and conserve those Aboriginal objects or declared Aboriginal places	Section 9
Any practical measures that may be taken to avoid or mitigate any actual or likely harm, alternatives to harm, or if this is not possible, to manage (minimise) harm	Section 9.3

Table 3: Requirements of Code of Practice and where met in this report

Requirement #	Where met
1 – Review previous archaeological work	Section 4.5
2 – Review the landscape context	Section 4
3 – Summarise and discuss the local and regional character of Aboriginal land use and its material traces	Section 4.5
4 – Predict the nature and distribution of evidence	Section 4.6
5 – Undertake an archaeological survey	Section 5
5a/b/c – Prepare an archaeological survey sampling strategy	Section 5.1; Appendix E
6 – Define identified sites	Section 5.7; mapping
7 – Site recording	Section 5.4; 5.5; 5.6
8 – Location information and geographic reporting	Report Figures
9 – Record survey coverage data	Section 5.3; 5.4; 5.5
10 – Analyse survey coverage	Section 5.3; 5.4; 5.5
15a – Consultation prior to test excavation	Section 3
15b – Test excavation sampling strategy	Appendix E



PO Box 236
NOWRA
NEW SOUTH WALES 2541

0 33 46
kilometers

Projection:
MGA Zone 56 (GDA 94)
Base Map:
Six Maps Topo
Final - Version 1

Figure 1: General location of the proposed development in its regional context.

N

PO Box 236
NOWRA
NEW SOUTH WALES 2541

0 265 530

metres

Projection:
MGA Zone 56 (GDA 94)
Base Map:
NearMaps 2022
Image Date: 07/05/2022
Final - Version 1

Figure 2:Study Area in its local context.

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2.0 Statutory Context

Heritage in Australia, including both Aboriginal and non-Aboriginal heritage, is protected and managed under several different Acts. The following section presents a summary of the applicable Acts which provide protection to cultural heritage within NSW.

2.1 Commonwealth Legislation

2.1.1 Aboriginal and Torres Strait Islander Heritage Protection Act 1984

This Act provides for the preservation and protection of injury and/or desecration of areas and objects in Australia and its waters that are of significance to Aboriginal people, in accordance with Aboriginal tradition.

Under this Act, the responsible Minister has provision to make both temporary and/or long-term declarations, in order to provide protection to areas and objects which are at threat of injury or desecration. In some instances, this Act can override State or Territory provisions, or be invoked if State or Territory provisions are not enforced. An Aboriginal or Torres Strait Islander individual or organisation must invoke the Act.

No items within the study area are listed or protected under this Act.

2.1.2 Environment Protection and Biodiversity Conservation Act 1999

The EPBC Act provides protection to environmental sites of national significance, including places with cultural heritage values that contribute to Australia's national identity. The Act aims to respect the role of Indigenous peoples in the conservation and ecologically sustainable use of Australia's biodiversity, and to enhance the protection and management of important natural and cultural places. Additionally, the Act is designed to promote the use of Indigenous peoples' knowledge of biodiversity with the involvement of, and in cooperation with, the owners of the knowledge.

The National Heritage List provides a listing of natural, historic and Indigenous places of outstanding significance to the nation, while the Commonwealth Heritage List details the Indigenous, historic and natural places owned or controlled by the Australian Government.

Under the EPBC Act, approvals are required if any action is proposed that will have (or is likely to have) a significant impact on the National Heritage values of a National Heritage place. Therefore, actions must be referred to the Australian Government Minister for the Environment and Heritage. A decision will be made as to whether the proposed action will have a significant impact on any matters of national significance.

A search of both the NHL and the CHL did not identify any items within the study area.

2.1.3 Native Title Act 1993

The *Native Title Act 1993*, as amended, provides protection and recognition for Native title. Native title is recognised where the rights and interests of over land or waters where Aboriginal and Torres Strait Islander practiced traditional laws and customs prior to the arrival of European settlers, and where these traditional laws and customs have continued to be practiced.

The National Native Title Tribunal (NNTT) was established to mediate native title claims made under this Act. Three registers are maintained by the NNTT, as follows:

- National Native Title Register
- Register of Native Title Claims
- Register of Indigenous Land Use Agreements.

Searching the NNTT registers allows identification of potential Aboriginal stakeholders who may wish to participate in consultation.

A search of all three registers identified a registered Native Title claim by the South Coast People over the study area (Figure 3); however, this claim has not yet been determined. No determined Native Title claims exist over the study area.

2.2 New South Wales Legislation

2.2.1 National Parks and Wildlife Act 1974

The *National Parks and Wildlife Act 1974* provides protection for all Aboriginal objects and places within NSW. Aboriginal objects are defined as the material evidence of the Aboriginal occupation of NSW, while Aboriginal Places are defined as areas of cultural significance to the Aboriginal community. All Aboriginal objects are protected equally under the Act, regardless of their level of significance. Aboriginal Places are gazetted if the Minister is satisfied that the location was and/or is of special significance to Aboriginal people.

Following amendments to the NPW Act in 2010, approval to impact Aboriginal cultural heritage sites is only granted under a Section 90 Aboriginal Heritage Impact Permit (AHIP), which is granted by Heritage NSW of the Department of Premier and Cabinet.

2.2.2 NSW National Parks and Wildlife Regulation 2019

Part 5, Division 2 addresses Aboriginal objects and places in relation to the NPW Act 1974, and outlines how compliance with relevant codes of practice can be met.

Clause 58(1) outlines the defence of low impact acts or omissions to the offence of harming Aboriginal objects, which includes maintenance works on existing roads and fire trails, farming and land management work, grazing of animals, activities on land that has been disturbed that is exempt or complying development, mining exploration work, removal of vegetation (aside from Aboriginal culturally modified

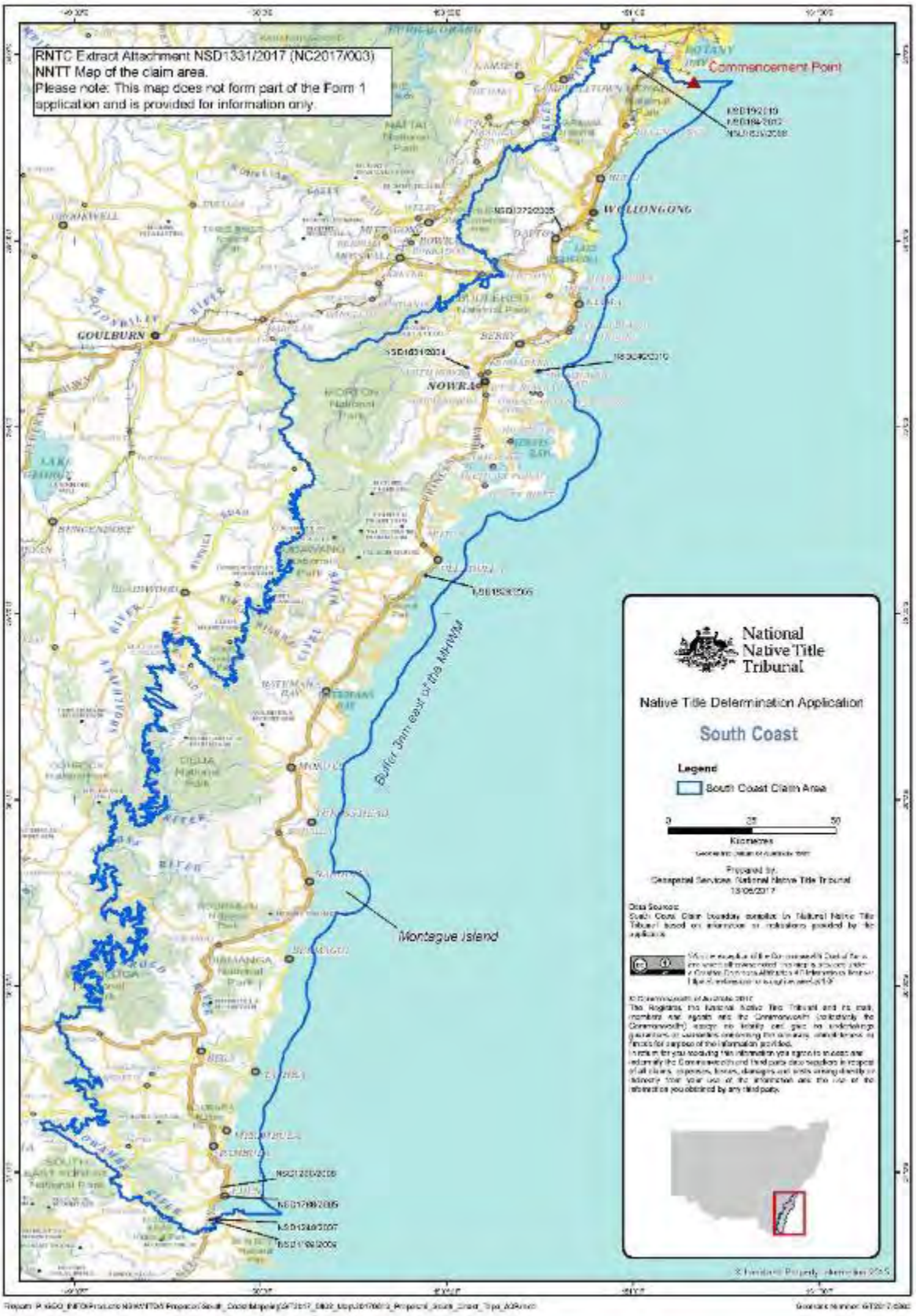


Figure 3: South Coast People, Tribunal No NC2017/003 Native Title Claim boundary

trees), seismic surveying or groundwater monitoring bores on disturbed ground, or environmental rehabilitation work (aside from erosion control or soil conservation works such as contour banks).

Clause 58(4) outlines the definition of 'disturbed land', as land that "has been the subject of a human activity that has changed the land's surface, being changes that remain clear and observable".

Clause 59 relates to the notification of Aboriginal objects and sites and Clause 60 relates to the requirements for the consultation process to support an AHIP application. The regulation sets out the requirements broadly in line with those outlined in the ACHCRs.

2.2.3 Environmental Planning & Assessment Act 1979

Under the EP&A Act, it is necessary to consider environmental impacts, including impact to cultural heritage, as part of the land use process. Local Environmental Plans (LEPs) and Development Control Plans (DCPs) are also required to be prepared by Local Government Areas (LGAs) in order to provide guidance on the applicable level of environmental assessment. LGAs are required to maintain a list of locally significant heritage items as part of their LEP. Under the EP&A Act, Part 3 describes the planning instruments at both local and regional levels; Part 4 relates to development assessment and consent processes, and Part 5 refers to infrastructure and environmental impact assessment.

The development application would be submitted under Part 4 of the EP&A Act, with Shoalhaven City Council the determining authority in this instance.

2.2.4 Shoalhaven LEP 2014

The *Shoalhaven Local Environmental Plan 2014* (SLEP) is the overarching planning instrument applicable to the Shoalhaven LGA.

Clause 5.10(2) (e) identifies that no buildings may be erected on land within a heritage conservation area or which contains an Aboriginal object, without first obtaining development consent. Further, Clause 5.10(2) (c) states that archaeological sites may not be disturbed or excavated without development consent. Exceptions to the requirement for development consent are detailed by Clause 5.10(3) and include low impact activities, or activities for the maintenance of a heritage item. Clause 5.10(8) requires that the effect of any development on an Aboriginal place of heritage significance must be considered, and the Aboriginal community must be notified of any proposed developments.

The study area is located on the boundary of two LEP heritage maps, as shown following. No heritage items are located within or immediately adjacent to the study area, although an archaeological item (A1) is located to the north east of the study area.

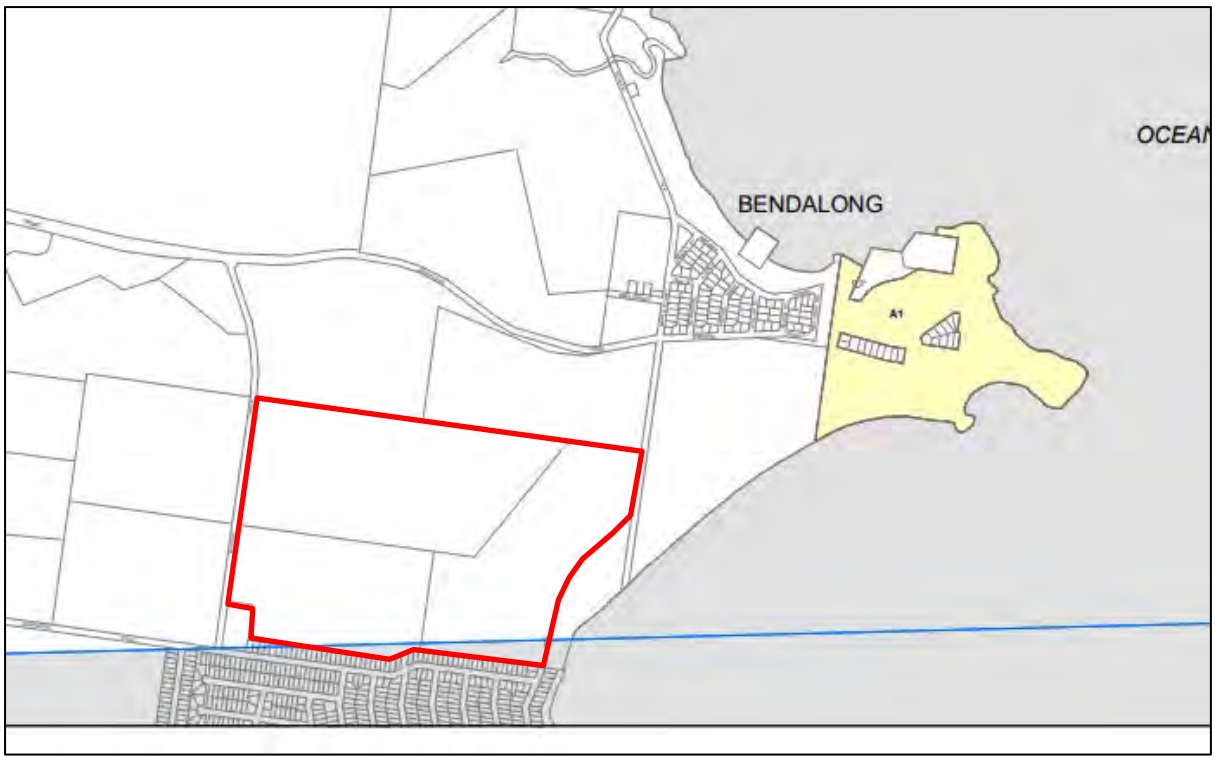


Figure 4: Detail of the SLEP Heritage Map. Approx study area outlined in red (Source: SLEP 2014 Heritage Map Sheet HER_015E)

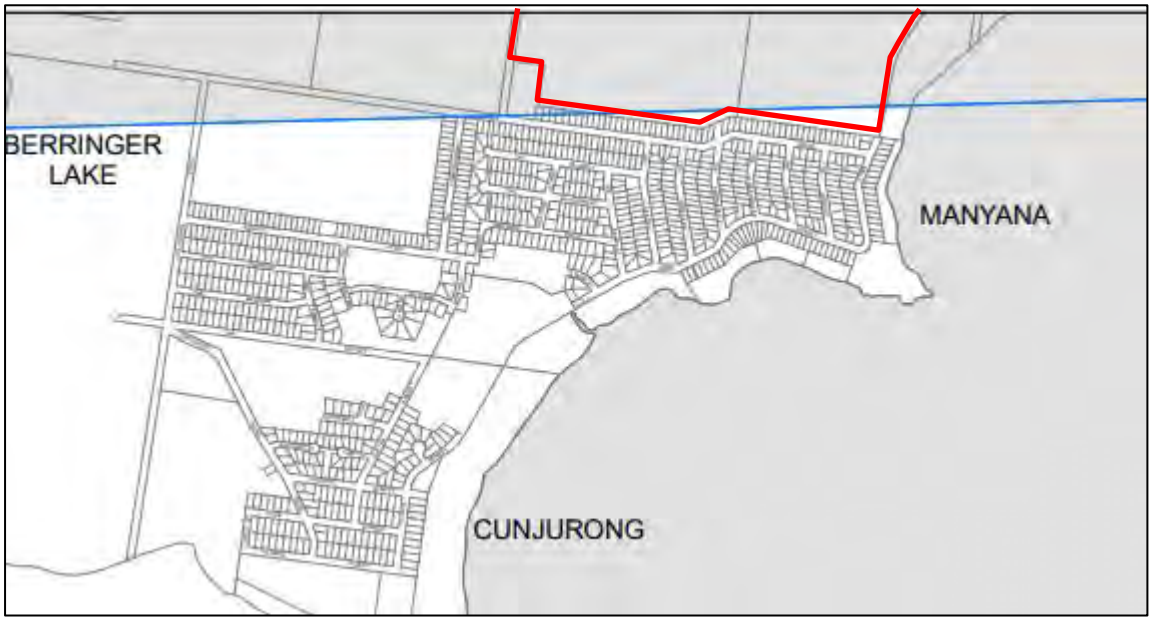


Figure 5: Detail of the SLEP Heritage Map. Approx study area outlined in red (Source: SLEP 2014 Heritage Map Sheet HER_015F)

The archaeological item labelled A1 comprises the Red Head timber mill and wharf, considered to be an "archaeological site with the potential to yield information about the timber and silica mining industries in the Red Head area" (SHI Heritage Item ID 2390259). This item would not be impacted by the proposal and is not

considered further in this assessment. There are no other heritage items listed on the Shoalhaven LEP within the study area or vicinity.

Although very few Aboriginal sites are listed in the SLEP 2014, the absence of nearby Aboriginal heritage items does not mean that the land has low Aboriginal cultural heritage significance.

3.0 Aboriginal Consultation Process

This section details the Aboriginal community consultation undertaken to assist in the heritage assessment of the study area. Aboriginal consultation in accordance with the *Aboriginal cultural heritage consultation requirements for proponents 2010* (the ACHCRs) was undertaken by Apex Archaeology for this project.

Aboriginal community consultation is a requirement in order to make assessments of Aboriginal cultural values, as Aboriginal people are the primary determinants of the significance of their cultural heritage and therefore Apex Archaeology cannot make a determination on the cultural significance without the input of the RAPs. Aboriginal people often have a strong connection to their Country, and to their ancestors, both past and present.

Material evidence of past Aboriginal occupation of an area is a tangible link to the intangible traditions, lore, customs, beliefs and history. These intangible values provide a sense of belonging for Aboriginal people, and cultural heritage and cultural practices are kept alive through being incorporated into everyday life, which helps maintain a connection to the past and to the present. It is a vital part of the identity of Aboriginal people.

Therefore, it is important that Aboriginal people are afforded the opportunity to understand, comment on and have input into projects that may impact areas which may be culturally sensitive, or damage items of cultural significance. The process of Aboriginal community consultation provides this opportunity, and this ACHAR details the results of the consultation undertaken for this project. Details of all consultation are included as Appendix A, attached to this report.

3.1 The Consultation Process

The *Aboriginal cultural heritage consultation requirements for proponents 2010* provide the process for undertaking consultation with the Aboriginal community. This process includes identification, registration, engagement and consultation with those Aboriginal people who may have cultural knowledge which is relevant to determining the cultural significance of Aboriginal objects and places which may be within the study area.

The Consultation Guidelines detail a number of stages for consultation, as follows:

- Identification of those people who should be consulted for the project
- Inviting Aboriginal people to register their interest in being consulted for the project
- Providing information regarding the nature and scope of the project to the Aboriginal people who have registered an interest in being consulted – the registered Aboriginal parties (RAPs)
- Providing opportunities for RAPs to comment on the proposed methodology for cultural heritage consultation

- Presenting information about the potential impacts of the proposed development for the RAPs to comment on
- Providing opportunities for RAPs to comment on the cultural significance of the proposed development area
- Providing opportunities for RAPs to comment on the draft reports detailing the results of the archaeological and cultural assessments for the project

3.2 Stage 1 Consultation: Commencement

Stage 1 requires a list of Aboriginal people who may have cultural knowledge relevant to the area to be prepared from several sources of information. The first step requires enquiries to be made of certain statutory bodies regarding whether they are aware of Aboriginal people or organisations that may have an interest in the study area, and their contact details. Any Aboriginal people or organisations identified in this step must be contacted and invited to register an interest in the project. In addition, a notification must be placed in local print media requesting Aboriginal people or organisations to register their interested in the project. A list of those who register an interest must be compiled. A minimum of 14 days from the date of the letter or newspaper advertisement must be allowed for registrations of interest.

As a result of the Stage 1 activities, a list of Aboriginal people who wish to be consulted for the project is developed. These Aboriginal people become the registered Aboriginal parties – the RAPS – for the project.

Letters requesting the details of Aboriginal people who may hold cultural knowledge relevant to the study area and who may wish to be consulted for the project were sent to several statutory agencies on 21 June 2021. Copies of these letters and responses are attached in Appendix B. These Step 1 letters were sent to the following agencies:

- Heritage NSW
- South East Local Land Services (SELLS)
- Shoalhaven City Council (SCC)
- Jerrinja Local Aboriginal Land Council (JLALC)
- Office of the Registrar, *Aboriginal Land Rights Act 1983 (NSW)* (ORALRA)
- Native Title Services Corp (NTSCorp)

Responses were received from Heritage NSW, JLALC, and NTSCorp. Heritage NSW provided a list of Aboriginal people and organisations with 56 people or organisations identified. These 56 individuals and organisations were invited to participate in consultation for the project, although it is noted that a number of individuals were contacted via a single email address, resulting in a total of 46 individual invitations issued.

JLALC registered their interest in consultation for the project. NTSCorp advised to contact the South Coast People as the Native Title claimants for the area via their

legal representatives, which was done. No further responses from or on behalf of the South Coast People were received.

An online search of the National Native Title Tribunal (NNTT) identified a Native Title Application over the study area on behalf of the South Coast People. The application has been accepted for registration but not yet determined.

The Aboriginal people and organisations identified during this initial stage were contacted via letter (email if provided or via post if no email address given) on 2 July 2021, inviting them to register an interest in the project. Registrations were accepted until 16 July 2021. This is Step 2 of Stage 1 of consultation. Copies of these letters are attached in Appendix C.

In addition, an advertisement was placed in the *South Coast Register* on 30 June 2021, inviting registrations of interest from people who may have cultural knowledge of the project area. A copy of the advertisement is attached in Appendix D.

A total of three Aboriginal people and organisations registered an interest in being consulted for the project. The following list comprises the registered Aboriginal parties (RAPs) for the project:

- Jerrinja LALC
- Goobah
- Woronora Plateau Gundungara

3.3 Stage 2 & 3 Consultation: Presentation and Gathering of Information

During Stage 2, information about the proposed project is provided to the RAPs, including location, scale, proposed development plans, timeframes, methodologies and any other relevant details relating to the project. This information can be provided in writing or at a meeting (or both), and an opportunity for the RAPs to visit the site may also be provided.

During Stage 3, RAPs are invited to share information about the cultural significance of the study area, which can assist in the assessment of the cultural significance of the Aboriginal objects and/or places within the study area. The cultural heritage assessment informs and integrates with the scientific assessment of significance and therefore can assist in the development of mitigation and management measures for the project. A methodology detailing how this information will be gathered must be provided to the RAPs for comment and a minimum of 28 days must be allowed for responses to be received. Any feedback must be considered and implemented as appropriate into the methodology.

Stage 2 and 3 can be undertaken concurrently. The information about the project and the methodology for seeking cultural knowledge can be provided in the same written documentation or at the same meeting.

Details of the proposed project and the proposed methodology for undertaking the cultural heritage and archaeological assessments for the project were provided in writing to each of the RAPs on 19 July 2021. Comments were accepted until 16 August 2021. A response was received from Goobah, supporting the methodology and requesting to be kept informed on further developments. No other responses were received.

No alternatives to our methodology were suggested or requested. The RAP responses are attached in Appendix E. No other comments were received from any of the other RAPs for the project.

No cultural information was received from any of the RAPs for the project during this stage of consultation.

3.4 Stage 4: Review of Draft Report

Stage 4 sees the preparation of the draft ACHAR, which details the results of the cultural heritage assessment. The draft is provided to the RAPs for their review and comment. A minimum of 28 days to comment on the ACHAR must be allowed. All comments must be addressed in the final document and the proponent's response to RAP comments must be included. Copies of any submissions received from RAPs must be included in the final ACHAR.

The report was provided to all RAPs for their review and comment on 5 November 2021, with comments accepted until 3 December 2021. No comments on the draft report were received from any of the RAPs, although Basil Smith of Goobah Developments advised he had had trouble downloading the report and asked for it to be resent, which was done. No further comments were received.

A copy of the final report was sent to all RAPs on 13 January 2022.

3.5 Project Updates

Subsequent to finalisation of the report, the Planning Proposal for rezoning of the land was discontinued and the proponent elected to submit an IDA in line with the current zoning of the lot. Apex Archaeology were engaged to update the existing report in line with comments received from Heritage NSW and to reflect the amended proposal, which was very similar in scope to the original proposal. As such, an update was sent to all RAPs on 15 July 2022, advising of the change of purpose of the report and that management recommendations still stood.

Additional updates were sent to the RAPs for the project in January and June 2023 to maintain consultation with the Aboriginal community. No responses to these updates were received.

Consultation with the Aboriginal community for this project has been conducted in accordance with the ACHCRs. A log of all correspondence is presented in Appendix A of this ACHAR. Copies of all correspondence are included in appendices to this report.

4.0 Aboriginal Cultural Heritage

This section presents information about both the physical and cultural landscape in which the study area is located, as well as previous archaeological and ethnohistorical studies, to provide context and background to the existing knowledge of Aboriginal culture in the area.

4.1 Existing Environment

The study area is located along the South Coast of NSW. This part of the South Coast is characterised by gentle rises above the coastline, which is formed of small, sandy beaches and creeks flow into the sea. Extensive marine platforms occur around prominent headlands.

The study area has been disturbed by previous land use practices, including historic land clearance, and subsequent use for 4WD and motorbike riding. It is also noted that a house was constructed within the site, which has since been demolished, and that a grave is located within the study area.

4.1.1 Soils, Geology and Topography

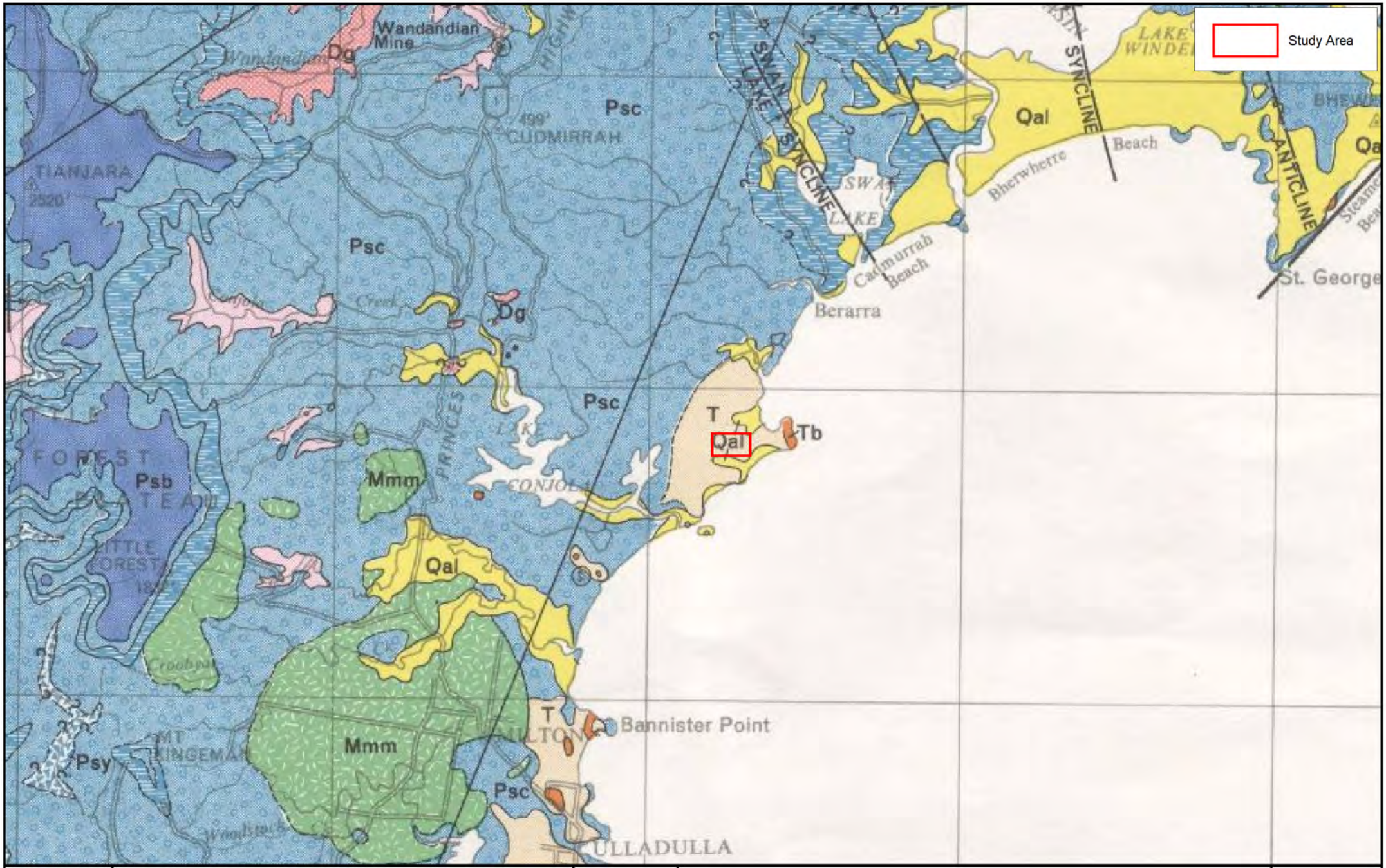
The underlying geology of the study area is from the Tertiary age (Figure 6). This consists of undifferentiated sediments including gravels, sand, clay, quartzite, sandstone and conglomerate (Ulladulla Geological Series Sheet S1 56-13). Silcrete is also associated with the deeply weathered Tertiary sediments in the Bendalong-Ulladulla area (Hughes et al 1973) and thus is available in the local area as a raw material. Large silcrete cobbles were identified on the surface of the site.

Soils within the western portion of the study area which is the current focus of the proposal are described in a previous geotechnical study as a dark brown clay loam underlain by clays to 2m at which point conglomerate bedrock occurs (Martens 2000c test pit 9E352TP1). The test excavations can confirm that the soils were indeed a clay loam consistently throughout the area tested within the development area with a consistent degree of disturbance (glass, building waste etc).

Overall, the study area slopes gently towards the east, with a low spur line running through the centre of the site. Two minor drainage lines converge in the eastern portion of the study area and then drain towards Manyana Beach. A flatter, swampy area is located within the eastern portion of the study area and is referred to as a "backdune" area.

4.1.2 Flora and Fauna

The study area was historically cleared by 1979 at the latest. Vegetation typically occurring within the area prior to clearing comprised open forests of Red Bloodwood (*Corymbia gummifera*), Old Man Banksia (*Banksia serrata*), Hakea (*Hakea sericea*), Melaleuca (*Melaleuca armillaris*), and Coast Rosemary (*Westringia fruticose*) on coastal headlands (GHD 2018). These species would have supported a range of fauna species. Both floral and faunal resources would have been exploited by the Aboriginal people in the area.



PO Box 236
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NEW SOUTH WALES 2541

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Kilometers

Projection:
MGA Zone 56 (GDA 94)
Base Map
Ulladulla-250K-Geological-Sheet-SI56-13-1st-edition
FINAL - Version 1

Figure 6:Underlying Geology of the Study Area.

N

4.1.3 HYDROLOGY

The nearest major permanent named water source is Washerwomans Creek, located approximately 900m north of the study area. Washerwomans Creek is a second order stream, and drains to the ocean at Washerwomans Beach. There are also numerous unnamed lower order drainage lines within the area which drain down into the surrounding coastline, including within the study area itself. Water courses can be classified according to the Strahler system as used by DPI Water (Figure 7). Watercourse classification ranges from first order through to fourth order (and above) with first order being the lowest, ie a minor creek or ephemeral watercourse, and fourth or above being a large watercourse such as a river.

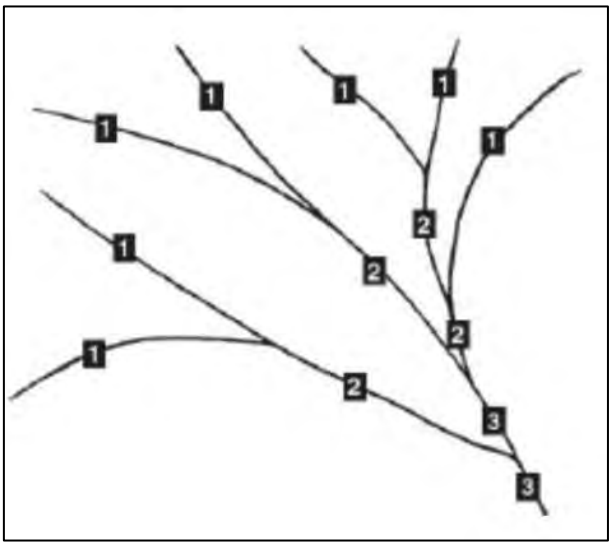


Figure 7: The Strahler system (Source: Department of Planning and Environment 2016).

4.2 LAND USE HISTORY

4.2.1 INDIGENOUS OCCUPATION

When Aboriginal occupation of Australia is likely to have first commenced, around 60,000 years ago (Mulvaney and Kamminga 1999; Bowdler *et al* 2003; Attenbrow 2010), sea levels were around 30-35m lower than present levels, and this further decreased to up to 130m lower than present sea levels (Attenbrow 2010). Sea levels stabilised around 7-6,500 years ago, and as a result many older coastal sites would have been inundated with increasing sea levels. It is possible that areas that are now considered "coastal" would once have limited resources available to Aboriginal people, and as such would have been less likely to have been occupied or used for repeated habitation sites.

Archaeological work at the Madjedbebe site in Arnhem Land in the Northern Territory revealed evidence confidently dated to the period before 45-46 ka and possibly up to 50-55 ka (Clarkson et al 2015). In NSW, there is strong evidence available to support Aboriginal occupation of the Cumberland Plain region in the Pleistocene period (approximately 40 ka) and possibly earlier. Work in Cranebrook Terrace was

dated to 41,700 years BCE by Stockton and Holland (1974), and a site in Parramatta within deep sandy deposits was dated to 25-30 ka (JMcDCHM 2005). Kohen's 1984 assessment of Shaws Creek in the Blue Mountain foothills yielded ages of 13 ka, while Loggers Shelter at Mangrove Creek was dated to 11 ka by Attenbrow (1987). Deeply stratified occupation deposits at Pitt Town were dated to 39ka (Apex Archaeology 2018). These ages are obtained from both radiocarbon and optically stimulated luminescence (OSL) dating.

Some experts have cast doubt onto the assessment of the items from Cranebrook Terrace as artefactual (Mulvaney & Kamminga 1999; McDonald 2008), although they do not doubt the results of the radiocarbon dates – it is the association of the artefacts with the dated deposits that is problematic, and Mulvaney and Kamminga (1999) consider that there are better examples of sites with more robust identification of age available. There has certainly been a great deal of research undertaken within the Sydney region in the intervening years.

Aboriginal people have occupied the NSW South Coast for at least 20,000 years (Boot 2002). Occupation sites dating to the Pleistocene period have been dated to c.20,000 Before Present (BP) at Burrill Lake (Lampert 1971) and c.17,000 BP at Bass Point (Bowdler 1970; 1976), with investigations suggesting a very low site occupation intensity during the Pleistocene era, with intensification of occupation commencing approximately 7,000 BP. The evidence at Burrill Lake came from a rockshelter, while Bass Point comprised an open context site on the gentle slopes of a ridgeline. Generally, the Pleistocene occupation of the South Coast is considered to have been sporadic and of low intensity, due to the low population levels postulated during this time (McDonald 2005).

Changing sea levels resulted in the ecological systems of the hinterland areas changing too, resulting in differing resources becoming available. This led to an increase in evidence of habitation of areas from around 6,500 BP, although it is unclear whether this relates to the survivability of more recent sites, or an increase in population. Hughes and Lampert (1982) suggested that a population increase is the only plausible explanation for the exponential increase in Holocene sites from 6,000 BP.

During the Holocene period around 6.5ka, sea levels increased and stabilised, which led to those groups on the coastal fringes turning inland (McDonald 2008). Prior to this, the coast would have been further offshore than current coastlines, meaning any sites within this region would have been inundated as sea levels rose. Recent works off the coast of Western Australia have identified relatively intact inundated Aboriginal archaeological sites, dated to 7,000-8,500 years BP at inundation (Benjamin *et al* 2020), which confirms that archaeological sites can be detected below sea level and should be considered in any works which may impact these drowned landscapes.

Around 5,000 years BP a change in archaeological assemblages can be seen, with an emphasis on the use of locally available stone for artefact production. Around 4,000 years ago people began to decrease their residential mobility and inhabit certain biogeographic zone on a permanent basis (McDonald 2008).

4.2.2 Post Contact Occupation

Following the establishment of the first European settlement at Sydney Cove, the need for additional agricultural land was identified, as Sydney Cove was considered unsuitable for farming. By November 1788, food supplies were running low for the settlement, and an expedition led by Governor Philip set off up the Parramatta River in search of arable land. An area known as Rose Hill (now Parramatta) was settled by a small group of 11 soldiers and 10 convicts. The grain crops at Sydney Cove failed, and the settlement at Rose Hill was ordered to be used for agriculture. These crops were luckily successful, and a further settlement comprising a convict farm was established at Toongabbie.

Exploration of the wider region continued, and in 1791, expeditions travelled the Hawkesbury and Nepean areas, identifying them as likely spots for agriculture. The Shoalhaven region had been sighted by Captain Cook in April of 1770, when he observed a protected bay which was later named Port Jervis, and he recorded evidence of smoke along the shoreline just before dark, which may have been related to Aboriginal campfires near the area now known as Bass Point.

Lieutenant James Grant recorded an account of an early meeting of Europeans and local Aboriginal people as being amicable (Grant 1801), with the Aboriginal people they encountered described as 'more robust than Sydney Blacks'.

James Meehan reached the Shoalhaven River in 1805 as part of his exploration of the region, and noted the extensive stands of red cedar along the lower reaches of the river (Antill 1982). The first official shipment of cedar left the Shoalhaven in 1811, and by the following year seven ships were transporting cedar out of the Shoalhaven (Antill 1982).

Settlement within the region continued to spread further south, and the first European settlers arrived in the Murramarang area in the 1820s, bringing cattle with them (Hamon 1994). The area was a rich source of timber and many sawmills were established up and down the coastline.

The original road south from Huskisson passed through Sussex Haven (Sussex Inlet), Swan Lake (Cudmirrah Lake), Berrara Creek, and Red Head (Kemp 1980), which would have passed near to the current study area. As the road was prone to flooding, a new route was found in 1857 along the current Princes Highway (Kemp 1980).

Sparce settlement to the north of Manyana commenced from the 1860s, with cedar getting the main industry in the area. The first lot in Manyana was selected by Peter Donnelly in 1855 at the north eastern end of Lake Berringer. The current study area was taken up by Jesse Goodsell around 1888 (McAndrew 1991; Plate 1).

Industry in the area was based originally on the timber industry, and later the silica industry, with silica extraction ceasing by the 1920s but resuming in the 1940s. The silica deposits had been originally recorded by Surveyor Florance in 1828, who noted flint around Mollymook, but this was not actively exploited until 1917 (McAndrew 1991). Silica mining in the area continued until 1975.

Aerial imagery of the site dating from 1970 (Plate 2) shows the area almost completely cleared of vegetation. Some unformed tracks are visible running roughly east – west through the study area, and some small structures are visible in the south western corner of the study area. By 1979 (Plate 3), some regrowth had appeared, but the majority of the area was still open.

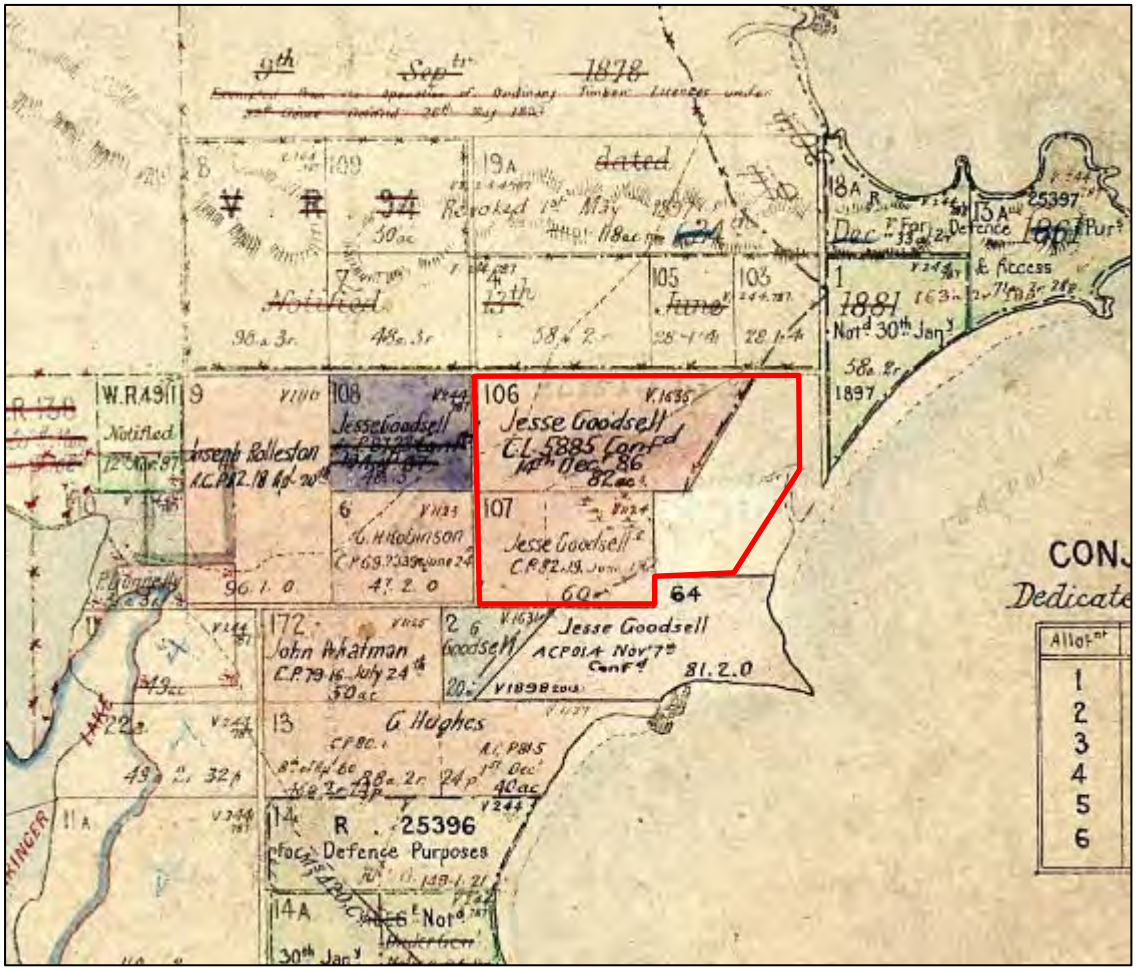


Plate 1: 1893 Parish of Conjola County of St Vincent. Approx study area in red

Plate 2: 1970 aerial. (Source: NSW GOV HIV)

Plate 3: 1979 aerial. (Source: NSW GOV HIV)

By 1987 (Plate 4), further revegetation had occurred within the study area, and the small structures in the south western corner had been demolished. Some further tracks are visible across the study area. The area was still predominately open by 1997 (Plate 5), but significant additional tracks were visible across much of the area.

Plate 4: 1987 aerial. (Source: NSW GOV HIV)

Plate 5: 1997 aerial. (Source: NSW GOV HIV)

By 2012 (Plate 6), two open areas within the study area were clearly visible, with the remainder covered in vegetation. Tracks across the study area were still clearly visible. These areas had reduced further by 2019 (Plate 7) due to further vegetation regrowth.

Plate 6: 2012 aerial. (Source: NearMap 2021)

Plate 7: September 2019 aerial. (Source: NearMap 2021)

In December 2019 and January 2020, severe bushfires tore through much of the eastern seaboard of Australia. Manyana was one of the areas hit hard by the fires

and this is evident in the aerial imagery taken before and after the fires (Plate 7Plate 8). Much of the vegetation within the eastern portion of the study area was completely burned, although the imagery remains dark due to the amount of vegetation burned.

Plate 8: January 2020 aerial. (Source: NearMap 2021)

Overall, while little development has occurred within the study area since settlement of the area, disturbance in the form of tracks and wholesale clearing of vegetation has occurred within the area and would have impacted the ground surface, particularly within the sandy areas in the eastern portion of the study area.

4.3 ETHNOHISTORY

Ethnohistorical evidence is based on the reports of colonisers and do not tend to include the Aboriginal perspective, leading to a Eurocentric view of Aboriginality. Additionally, historical records can be contradictory and incomplete regarding the exact tribal boundaries and locations of ceremonial or domiciliary activities of Aboriginal people pre-contact within the South Coast region. Boot (2002:58) notes:

> *The problem associated with ethnohistoric documents include their tendency to record unusual, rather than everyday events, and their focus on religious behaviour to the exclusion of woman and children (Attenbrow 1976:34; Sullivan 1983:12.4).*

As such, there are several versions of the Aboriginal history prior to colonisation, mostly due to differing records made in the historical period. Howitt (1904) defined the Yuin tribal area as extending from Cape Howe in the south to the Shoalhaven River in the north. Linguistically, the communities living between Batemans Bay and

Lake Conjola were identified as speaking Thurumba Muthang, which appeared to be a mixture of languages spoken to the north and south (Wesson 2000).

Other historical records made by early colonists indicate the study area is located within lands traditionally occupied by the Wandandian people (Tindale 1974). It is noted that the Wandandian people were considered to have occupied an area extending from the Shoalhaven River south to Ulladulla (Tindale 1974).

However, some members of the Aboriginal community dispute these associations and claim the area falls within the lands of the Jerrinja tribe, which extends from Crooked River in the north to the Clyde River in the south. The Jerrinja tribe have been referred to as the "Saltwater people of the Shoalhaven" (Penfold 2017).

As such, it is difficult to make definitive claims regarding the history of the people who once inhabited the area.

Regardless of the specific identity of the original inhabitants of the area, Aboriginal society in general was constructed of a hierarchy of social levels and groups, with fluid boundaries (Peterson 1976), with the smallest group comprising a family of a man and his wife/wives, children and some grandparents, referred to as a 'clan' (Attenbrow 2010). The next level consists of bands, which were small groups of several families who worked together for hunting and gathering purposes (Attenbrow 2010). The third level comprised regional networks with a number of bands, and these bands generally shared a common language dialect and/or had a belief in a common ancestor. Networks would come together for specific ceremonial purposes. The highest level is described as a tribe, which is usually described as a linguistic unit with flexible territorial boundaries (Peterson 1976); although Attenbrow (2010) argues that "these groups were not tribes in the current anthropological sense of the word".

The traditional lifestyles of Aboriginal groups depended largely on the environment in which they lived. Whilst hinterland groups relied on freshwater and terrestrial animals and plants, coastal groups utilised marine and estuarine resources. Manyana falls within the coastal region, with access to both marine and inland resources. Animals such as kangaroos, wallabies, possums, gliders, bandicoots, wombats, quolls, fruit bats, echidnas, native rats and mice, emus, ducks, tortoises, snakes and goannas (Attenbrow, 2010), played a major role in the subsistence of coastal groups, while other resources included shellfish such as oysters, crustacea such as crayfish and crabs, and marine animals including dolphins, dugongs, fish, shark, eel, seals and whales (Boot 1994). Fishing was conducted from canoes with spears, or collected along the shore (Tench in Attenbrow 2010). Beached whales were eaten, as observed by the British settlers in the late 18th century.

The different environments of the Manyana area contain a diverse range of plant and animal species. On creek banks and surrounds, a wide variety of game would have been found. The vegetation communities along the creeks and gullies, primarily

woodlands, would have provided shelter for numerous animal and plant species that could be eaten or used for other purposes such as providing shelter and medicines.

The Aboriginal people of the area would have utilised a range of hunting and gathering equipment, including fishing and hunting spears made of wood and barbed with shell, flaked stone blades, shark teeth, or sharpened bone; boomerangs and spear-throwers; fishing hooks made from bird talons, bone, wood and shell; ground stone axes; anvils and pounders; stone tools including blades and scrapers; shields, clubs and digging sticks made from wood; baskets made from bark; and wooden canoes (Attenbrow 2010).

Shelter is a basic need for any humans and historical records report either rockshelters or huts constructed from bark, branches and leaves were utilised for shelter. Coastal groups tended to build larger huts than the hinterland groups, and within the Manyana region, huts known as gunyas were likely the dominant choice of shelter due to the limited nature of rockshelters (Attenbrow 2010; Penfold 2017). There is some discussion regarding whether Aboriginal people moved regularly from place to place, or whether they lived at one campsite for a longer period of time and ranged out for resources, returning to their home base as necessary, with Penfold providing oral histories stating the Jerrinja peoples tended to have multiple home bases for different seasons, and relied on gunyahs for shelter (Penfold 2017).

4.3.1 Raw Materials

A wide range of raw materials were selected by Aboriginal people for flaking to create stone implements. Material types ranged from high quality to poor quality for flaking purposes, depending on the geology of the area and readily available material types. The following is a description of a range of raw material types known to have been utilised by Aboriginal people for the creation of stone artefacts.

Breccia

Breccias are coarse, angular volcanic fragments cemented together by a finer grained tuffaceous matrix.

Chalcedony

Chalcedony is a microcrystalline, siliceous rock which is very smooth and can be glossy. Introduction of impurities can produce different coloured versions of chalcedony, including yellow/brown (referred to as carnelian), brown (sard), jasper (red/burgundy) and multicoloured agate. It flakes with a sharp edge and was a prized material type for the creation of stone artefacts in parts of Australia (Kuskie & Kamminga 2000: 186).

Chert

Chert is a highly siliceous sedimentary rock, formed in marine sediments and also found within nodules of limestone. Accumulation of substances such as iron oxide during the formation process often results in banded materials with strong colours. Chert is found in the Illawarra Coal Measures and also as pebbles and colluvial

gravels. It flakes with durable, sharp edges and can range in colour from cream to red to brown and grey.

Petrified Wood

Petrified wood is formed following burial of dead wood by sediment and the original wood being replaced by silica. Petrified wood is a type of chert and is a brown and grey banded rock and fractures irregularly along the original grain.

Quartz

Pure quartz is formed of silicon dioxide, and has a glossy texture and is translucent. Introduction of traces of minerals can lead to colouration of the quartz, such as pink, grey or yellow. The crystalline nature of quartz allows for minute vacuoles to fill with gas or liquid, giving the material a milky appearance.

Often quartz exhibits internal flaws which can affect the flaking quality of the material, meaning that in general it is a low-quality flaking material (Kuskie & Kamminga 2000: 186). However, quartz is an abundant and widely available material type and therefore is one of the most common raw materials used for artefact manufacture in Australia. Flaking of quartz can produce small, very sharp flakes which can be used for activities such as cutting plant materials, butchering and skinning.

Quartzite

Formed from sandstone, quartzite is a metamorphic stone high in silica that has been heated or had silica infiltrate the voids found between the sand grains. Quartzite ranges in colour from grey to yellow and brown.

Silcrete

Silcrete is a siliceous material formed by the cementing of quartz clasts with a matrix. These clasts may be very fine grained to quite large. It ranges in colour from grey to white, brown, red or yellow. Silcrete flakes with sharp edges and is quite durable, making silcrete suitable for use in heavy duty woodworking activities and also for spear barbs (Kuskie & Kamminga 2000:184).

Tuff/Indurated Mudstone

There is some disagreement relating to the identification of lithic materials as tuff or indurated mudstone. The material is a finely textured, very hard yellow/orange/reddish-brown or grey rock. Kuskie and Kamminga (2000: 6, 180) describe that identification of lithic materials followed the classification developed by Hughes (1984), with indurated mudstone described as a common stone material in the area. However, Kuskie and Kamminga's analysis, which included x-ray diffraction, identified that lithics identified as 'indurated mudstone' was actually rhyolitic tuff, with significant differences in mineral composition and fracture mechanics between the stone types. They define mudstone as rocks formed from more than 50% clay and silt with very fine grain sizes and then hardened.

The lithification of these mudstones results in shale (Kuskie & Kamminga 2000: 181) and thus 'indurated mudstone', in the opinion of Kuskie and Kamminga, do not produce stones with the properties required for lithic manufacture.

In 2011, Hughes, Hiscock and Watchman undertook an assessment of the different types of stones to determine whether tuff or indurated mudstone is the most appropriate terminology for describing this lithic material. The authors undertook thin section studies of a number of rocks and determined that the term 'indurated mudstone' is appropriate, with an acknowledgment that some of this material may have been volcanic in origin. They also acknowledge that precise interpretation of the differences between material types is difficult without detailed petrological examination, and suggest that artefacts produced on this material are labelled as 'IMT' or 'indurated mudstone/tuff'.

VOLCANIC

Both volcanic and acid volcanic stones are a commonly used raw material type within the South Coast. Without detailed petrological analysis it can be difficult to identify the specific raw material, and for the purposes of archaeological assessment these fine grained materials are referred to as volcanic. Material such as obsidian is however separated and visually quite different to other volcanic material, which is often grey in colour and heavy for its size.

4.3.2 PROCUREMENT

Assemblage characteristics are related to and dependent on the distance of the knapping site from raw materials for artefact manufacture, and different material types were better suited for certain tasks than other material types. Considerations such as social or territorial limitations or restrictions on access to raw material sources, movement of groups across the landscape and knowledge of source locations can influence the procurement behaviour of Aboriginal people. Raw materials may also have been used for trade or special exchange between different tribes.

4.3.3 MANUFACTURE

A range of methodologies were used in the manufacture of stone artefacts and tools, through the reduction of a stone source. Stone may have been sourced from river gravels, rock outcrops, or opportunistic cobble selection. Hiscock (1988:36-40) suggests artefact manufacture comprises six stages, as follows:

1. The initial reduction of a selected stone material may have occurred at the initial source location, or once the stone had been transported to the site.
2. The initial reduction phase produced large flakes which were relatively thick and contained high percentages of cortex. Generally the blows were struck by direct percussion and would often take advantage of prominent natural ridges in the source material.

3. Some of these initial flakes would be selected for further reduction. Generally only larger flakes with a weight greater than 13-15 grams would be selected for further flaking activities.
4. Beginning of 'tranchet reduction', whereby the ventral surface of a larger flake was struck to remove smaller flakes from the dorsal surface, with this retouch applied to the lateral margins to create potential platforms, and to the distal and proximal ends to create ridges and remove any unwanted mass. These steps were alternated during further reduction of the flake.
5. Flakes were selected for further working in the form of backing.
6. Suitable flakes such as microblades were retouched along a thick margin opposite the chord to create a backed blade.

Hiscock (1986) proposed that working of stone materials followed a production line style of working, with initial reduction of cores to produce large flakes, followed by heat treatment of suitable flakes before the commencement of tranchet reduction. These steps did not necessarily have to occur at the same physical location, but instead may have been undertaken as the opportunity presented.

4.4 AHIMS Results

A search of a 5km search box centred over the study area was conducted on 28 October 2019, with a total of 58 sites identified within the search area. A second basic search over the study area, utilising the 'Search by Map' feature of AHIMS, was undertaken on 25 October 2021, with a total of 52 sites identified. A subsequent extensive search over the same area returned a total of 53 sites. It is acknowledged that AHIMS is currently being upgraded, and some technological issues are being faced as a result. However, the results have informed the current assessment to the best of our abilities. The registered sites are shown on Figure 8 and in Table 4 below. A copy of the search results is appended in Appendix F. Figure 9 shows registered sites within the study area itself.

Table 4: Sites identified during AHIMS search

Site ID	Site Name	Site Features	Recorders
58-2-0457	Yorks Street Cunjurong Point	Artefact : -	Mr. Geoffrey Young
58-2-0403	Manyana Subdivision 4 (MS4)	Artefact : 2	Navin Officer Heritage Consultants Pty Ltd
58-2-0376	CS15N	Artefact : -	Navin Officer Heritage Consultants Pty Ltd
54-2-0035	BO2 (Berrara2) Cunjurong	Artefact : -	Kelleher Nightingale Consulting Pty Ltd
58-2-0397	CS25 Conjola Sewerage 25 and PAD4	Potential Archaeological Deposit (PAD) : 1, Artefact : 2	Navin Officer Heritage Consultants Pty Ltd
58-2-0340	4 Manyana;	Artefact : -	Mr. Peter Kuskie

Site ID	Site Name	Site Features	Recorders
58-2-0396	CS19 - Inyadda Beach Carpark	Artefact : 8	Navin Officer Heritage Consultants Pty Ltd
58-2-0370	CS9	Potential Archaeological Deposit (PAD) : - , Artefact : -	Navin Officer Heritage Consultants Pty Ltd
58-2-0380	CS8 Bendalong IF2	Artefact : -	Navin Officer Heritage Consultants Pty Ltd
58-2-0231	Bendalong;Red Head;	Shell : -, Artefact : -, Burial : -	ASRSYS
58-2-0337	1 Manyana;	Artefact : -	Mr. Peter Kuskie
58-2-0338	2 Manyana;	Artefact : -	Mr. Peter Kuskie
58-2-0368	CS6	Artefact : -	Navin Officer Heritage Consultants Pty Ltd
58-2-0369	CS7	Artefact : -	Navin Officer Heritage Consultants Pty Ltd
58-2-0400	CS24 - Conjola Sewerage 24	Artefact : 7	Navin Officer Heritage Consultants Pty Ltd
54-1-0094	BO1 (Berrara1) Milton	Artefact : 1	Kelleher Nightingale Consulting Pty Ltd
58-1-1042	LC-OS-02	Artefact : 1	Kayandel Archaeological Services
58-2-0131	Cunjurong Headland;	Shell : -, Artefact : -	A.J Williams
58-2-0402	Manyana Subdivision 5 (MS5)	Artefact : 6	Navin Officer Heritage Consultants Pty Ltd
54-2-0036	BO3 (Berrara3) Sussex Inlet	Artefact : 1	Kelleher Nightingale Consulting Pty Ltd
58-2-0241	Manyannah Beach;Manyanah Creek;	Shell : -, Artefact : -	Val Attenbrow
58-2-0438	Bendalong2Manyana1 (B2M1)	Artefact : 3	Doctor. Sue Feary, Mr. Geoffrey Young
58-2-0235	Bendalong;Washerwomans Beach;	Stone Quarry : -, Artefact : -	ASRSYS
58-2-0220	Bendalong;	Shell : -, Artefact : -	Miss. Marjorie Sullivan, Phil Hughes
58-2-0441	LC-OS-01	Artefact : 1	Kayandel Archaeological Services
58-2-0476	York Street Midden	Shell : 1	Shoalhaven City Council - Nowra, Mr. Geoffrey Young
58-2-0406	Manyana Subdivision 1 (MS1)	Artefact : 2	Navin Officer Heritage Consultants Pty Ltd
58-2-0408	Manyana 1	Artefact : 13	Mr. Edward Clarke
58-2-0375	CS14	Potential Archaeological Deposit (PAD) : - , Artefact : -	Navin Officer Heritage Consultants Pty Ltd
58-1-0987	CS29-Conjola Sewerage 29	Artefact : 1	Navin Officer Heritage Consultants Pty Ltd

Site ID	Site Name	Site Features	Recorders
58-2-0398	PAD1 (Conjola Sewerage Scheme)	Potential Archaeological Deposit (PAD) : 1	Navin Officer Heritage Consultants Pty Ltd
58-2-0367	CS5	Artefact : -	Navin Officer Heritage Consultants Pty Ltd
54-2-0038	BO5 (Berrara5) Sussex Inlet	Artefact : -	Kelleher Nightingale Consulting Pty Ltd
54-2-0037	BO4 (Berrara4) Sussex Inlet	Artefact : -	Kelleher Nightingale Consulting Pty Ltd
58-2-0372	CS11	Artefact : -	Navin Officer Heritage Consultants Pty Ltd
58-1-0077	Red Head;Bendalong;	Stone Quarry : -, Artefact : -	ASRSYS
58-2-0467	Cunjurong Point Road Scatter 1	Artefact : -	Biosis Pty Ltd - Wollongong, Mrs. Samantha Keats
58-2-0394	Washerwomans Creek	Modified Tree (Carved or Scarred) : 1	NPWS - Ulladulla
58-2-0373	CS12N	Artefact : -	Navin Officer Heritage Consultants Pty Ltd
58-2-0233	Bendalong;Washerwomans Beach;	Stone Quarry : -, Artefact : -	ASRSYS
58-2-0399	CS20 - Beringer Lake 1	Artefact : 50	Navin Officer Heritage Consultants Pty Ltd
58-2-0472	Lake Conjola North	Artefact : 1, Shell : 1	Doctor. Sue Feary
58-2-0371	CS10N	Artefact : -	Navin Officer Heritage Consultants Pty Ltd
58-2-0234	Bendalong;Washerwomans Beach;	Shell : -, Artefact : -	ASRSYS
58-2-0404	Manyana Subdivision 3 (MS3)	Artefact : 5	Navin Officer Heritage Consultants Pty Ltd
58-2-0341	5 Manyana;	Artefact : -	Mr. Peter Kuskie
58-2-0339	3 Manyana;	Artefact : -	Mr. Peter Kuskie
58-2-0232	Bendalong;Boat Harbour Beach;	Stone Quarry : -, Artefact : -	ASRSYS
58-2-0374	CS13	Artefact : -	Navin Officer Heritage Consultants Pty Ltd
58-2-0477	BENDALONG;REDHEAD	Artefact : 1, Shell : 1	DPIE - Armidale, Miss. Rose O'Sullivan
58-1-0828	CS17	Artefact : -	Navin Officer Heritage Consultants Pty Ltd
58-2-0377	CS16	Shell : -, Artefact : -	Navin Officer Heritage Consultants Pty Ltd
58-2-0405	Manyana Subdivision 2 (MS2)	Artefact : 1	Navin Officer Heritage Consultants Pty Ltd

PO Box 236
NOWRA
NEW SOUTH WALES 2541

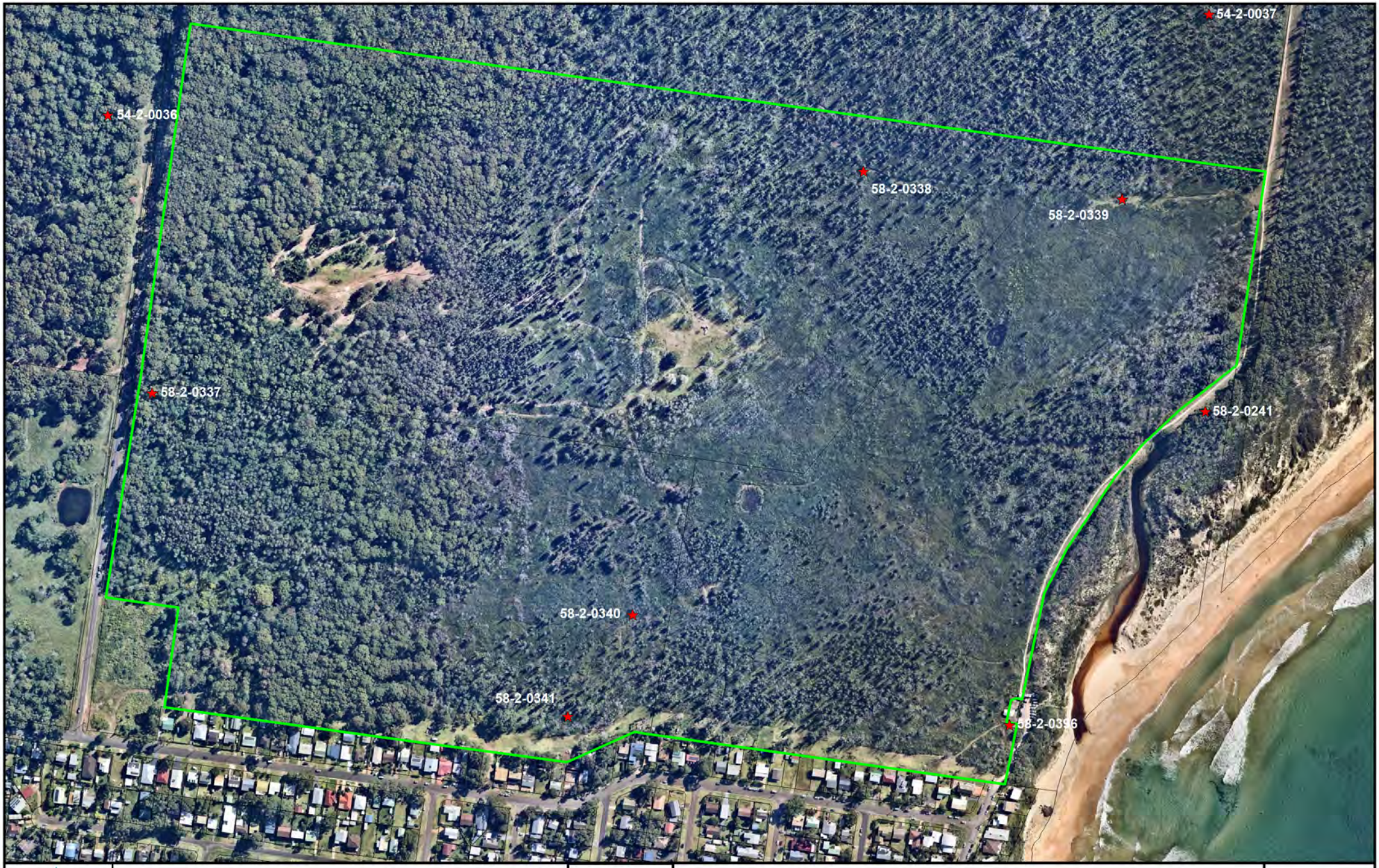
0 1.25 2.5

kilometers

Projection:
MGA Zone 56 (GDA 94)
Base Map:
NearMaps 2021
Image Date: 01/04/2021
Final - Version 1

Figure 8: AHIMS sites in relation to the study area.

N



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Projection:
MGA Zone 56 (GDA 94)
Base Map:
NearMaps 2021
Image Date: 01/04/2021
Final - Version 1

Figure 9: AHIMS sites within the study area.

N

The majority of the previously registered sites (n=36; 68%) comprise artefact sites; either isolated finds or artefact concentrations of up to 50 individual items. A total of eight (15%) sites were identified as containing shell material, either in isolation or in association with artefacts, and, in one case, in association with both artefacts and a burial (1%). Four sites (7.5%) identified as having potential archaeological deposits were registered, both with and without surface artefacts, along with a single modified tree (1%) and four stone quarries in association with artefacts (7.5%).

Of the identified sites, a total of seven sites fall within the study area and are discussed below. It is noted that the registered location of site 58-2-0241 is located outside the study area boundaries, but the site extends into the study area itself.

58-2-0337 (Manyana 1)

This site was recorded by Kuskie in 1997 and is described as:

> *...an artefact scatter [which] extends across most of Portion 106 and has been recorded within seven loci (A-G). the site occurs on the crest and simple slopes of a low spur, located between the two watercourses. Gradients are typically less than three degrees and aspect varies. The maximum dimensions of the recorded site are 650 metres in an east-west direction and 330 metres in a north-south direction.*
>
> *Conditions of surface visibility vary between 5 and 95% at the site. archaeological visibility varies between 5 and 60%. The artefacts are located along vehicle tracks leading east into the property from Inyadda Drive, the trail-bike circuit, and other vehicle tracks within Portion 106. Outside of these areas surface visibility is extremely low, due to the surrounding cover of grass and regrowth vegetation. The recorded portions of the site along the vehicle tracks are of moderate or low integrity, due to levels of ground disturbance associated with use of the tracks (wheel ruts). The portion of the site within the trail-bike circuit is of low integrity due to the high levels of ground disturbance associated with construction, maintenance and use of the track. Soils tend to silty, overlying a clay horizon. A high potential exists for sub-surface deposits within the basal slopes of Locus B and a shallow deposit on the spur crest within Loci A and C. There is a high potential for the site to extend over further areas of the same landform units.*
>
> *Eighty artefacts were recorded within Locus A... a vehicle track extending east from Inyadda Drive towards the southern watercourse and connecting with Curvers Drive, within an area measuring approximately 530 x 2 metres with 60% average archaeological visibility (artefact no. 21-30 in 390 m^2 area of 5% archaeological visibility).*
>
> *Two artefacts were recorded within Locus B... on a series of crisscrossed unformed vehicle tracks on a broad basal slope, cleared of vegetation, near the confluence of the two watercourses. The artefacts occur within an area surveyed of approximately 950m^2 of effective coverage.*

Seventy-seven artefacts were recorded within Locus C...on a series of vehicle tracks and clearings between the Locus A vehicle track and the trail-bike circuit (Locus D). The artefacts occur on the spur crest within an area surveyed of approximately 950m^2 of effective coverage.

Twenty artefacts were recorded within Locus D, the trail-bike circuit located on a broad simple slope. The artefacts occur within an area surveyed of approximately 735m^2 of effective coverage.

Six artefacts were recorded within Locus E, a trail leading north from the trail-bike circuit to the northern watercourse. The artefacts occur on a simple slope within an area of approximately 130m^2 of effective coverage.

Three artefacts were recorded within Locus F, a trail leading east from the trail-bike circuit to the northern watercourse. The artefacts occur on a simple slope within an area of approximately 30 x 1.5 metres with 60% visibility.

Seven artefacts were recorded within Locus G, a trail leading from the trail-bike circuit to the northern watercourse. The artefacts occur on a simple slope within an area of approximately 80m2 of effective coverage.

Overall, the mean artefact density per hundred square metres of effective site area (accounting for archaeological visibility) is 5.5. The mean densities for each loci range from 0.2 on the basal slope at Locus B, where recent sedimentation may have acted to bury the archaeological evidence, to 12.2 at Locus A on the main spur. The raw material of the assemblage is dominated by silcrete (96%), with minor frequencies of quartz (2%), chert (1.5%) and chalcedony (0.5%). Artefact types and frequencies include flakes (24%), flaked pieces (20%), broken blades (15%), broken flakes (13%), cores (13%), blades (8%), blade cores (4%), broken cores (1%) and chips (0.5%).

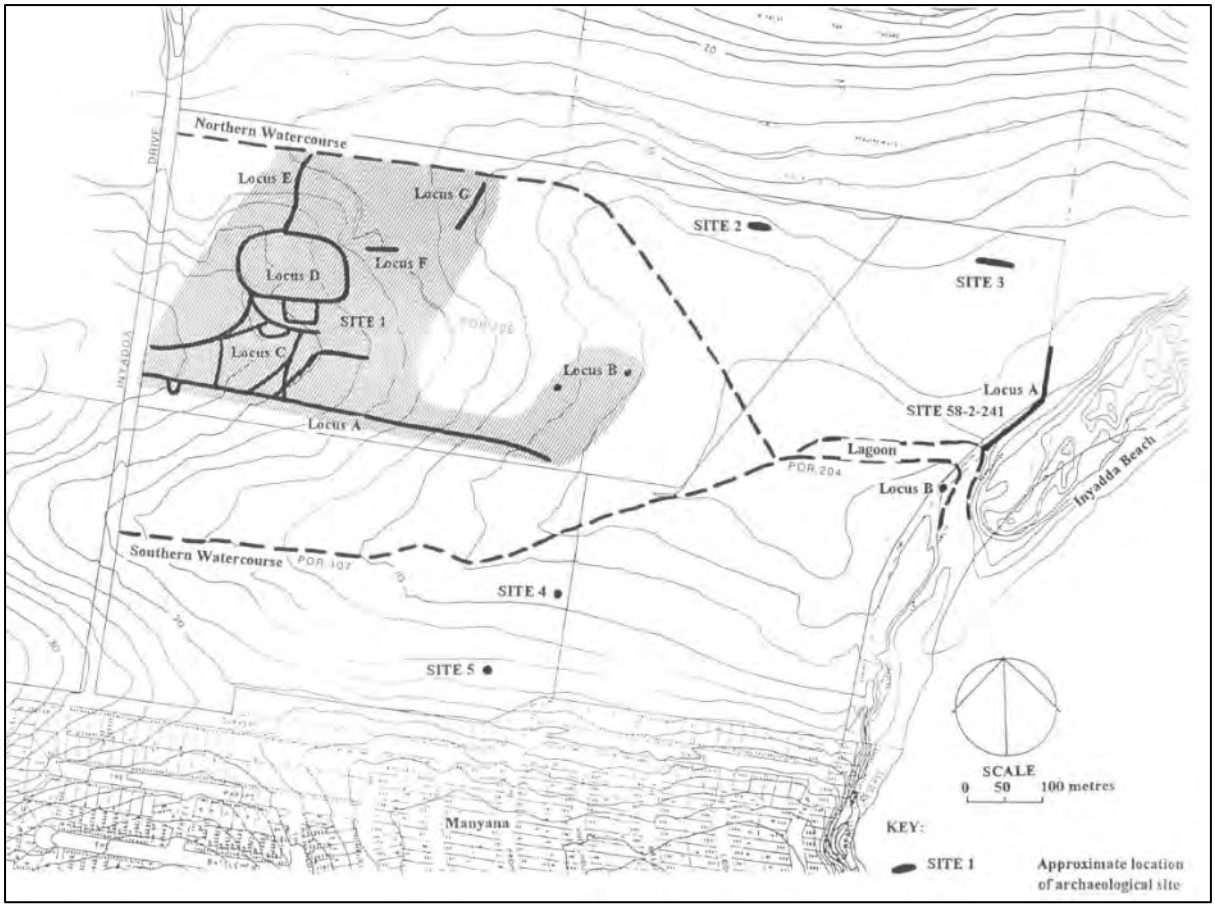

Figure 10: Artefact locations identified by Kuskie in 1997 (Source: Kuskie 1997:29)

58-2-0338 (MANYANA 2)

This site was also recorded by Kuskie in 1997 and is described as follows:

> *The site is an artefact scatter located... in the north-eastern section of Portion 106, close to the northern boundary of the property. The site occurs on a flat, with a gradient less than one degree and an open aspect. The unnamed northern watercourse flows approximately 100 metres to the south of the site.*
>
> *Conditions of surface visibility average 40% at the site. Archaeological visibility averages approximately 20%. The artefacts are located along a vehicle track. Visibility off this track is extremely low, due to the surrounding cover of dense shrub vegetation. The recorded portion of the site along the track is of low integrity, due to levels of ground disturbance associated with use of the tract (wheel ruts, bogged vehicles). The upper soil horizon is sandy. The potential for sub-surface deposits to exist is very high. There is an equally high potential for the site to extend over further areas of the same landform unit, adjacent to the vehicle track.*
>
> *The sixteen artefacts recorded extend for 35 metres along the 2-6 metre wide track. Ten stone artefacts were recorded within an area measuring 5 x 2 metres*

(40% archaeological visibility), and a further six artefacts occur within an area measuring 30 x 2.5 metres (20% archaeological visibility).

58-2-0339 (Manyana 3)

Manyana 3 is located in the north eastern corner of the study area and includes two silcrete artefacts within a relatively flat area of 65 x 3m. The area was considered to have high potential for further artefacts and subsurface deposit to be present.

58-2-0340 (Manyana 4)

Manyana 4 is located within the central southern portion of the site, on the lower portion of a simple slope, approximately 60m south of a watercourse. Artefacts were visible along a vehicle track leading south to Curvers Drive. Visibility either side of the track was extremely low due to vegetation cover. The site was considered to be of low integrity due to the impact of vehicular use of the track. It was considered likely that the site extended further over the same landform unit. Two artefacts were identified, both grey silcrete.

58-2-0341 (Manyana 5)

Three grey silcrete flaked pieces were identified on the mid-portion of a simple slope in the southern portion of the study area, to the rear of existing dwellings along Curvers Drive, approximately 140m south of a watercourse. The artefacts were identified on a vehicle track and the area was considered to be disturbed by vehicular access to the area. The deposit was considered likely to extend over further areas of the same landform unit.

58-2-0241 (Manyannah Beach)

The site comprises shell material on the bank of "Manyanah Creek" which was concluded to be part of an *in situ* midden deposit. An additional 15 artefacts were recorded by Kuskie comprising silcrete, quartz, quartzite and volcanic porphyry. Artefacts were noted within a 180 x 2m area of an existing easement on north side of lagoon.

58-2-0396 (CS19 – Inyadda Beach Carpark)

Site consists of eight artefacts exposed along a foot track extending southwest from a gravel carpark at the northern end of a dirt track continuing Sunset Strip, Manyana. The foot track enters the carpark at a point 13m south of a toilet block located on the western edge of the carpark.

Artefacts were noted over a distance of 60m along the track. Artefacts identified included a ground edge hatchet.

Summary

There are a total of six previously registered sites located within the study area, with two in close proximity to the boundaries of the site. All sites are listed as valid on thee AHIMS register.

It is noted that site Manyana 6 (identified by ERM in 2004) does not appear on the AHIMS search, despite the report noting that a site card was lodged at the time the report was prepared. This site is likely an extension of 58-2-0396 as they are both located in close proximity to each other, in the south eastern corner of the study area.

4.5 Previous Archaeological Work

An analysis of previous archaeological work within the study area assists in the preparation of predictive models for the area, through understanding what has been found previously. By compiling, analysing and synthesising the previous archaeological work, an indication of the nature and range of the material traces of Aboriginal land use is developed. An understanding of the context in which the archaeological assessment is vital, as development does not occur within a vacuum, but within a wider cultural landscape, and this must be considered during any archaeological assessment in order to develop appropriate mitigation and management recommendations.

4.5.1 Regional Heritage Assessments

The archaeological work previously completed within the wider region is summarised here.

Lampert 1971

In 1971, Lampert published the results of excavations within rock shelters at Burrill Lake and Currarong on the South Coast of NSW. Initial excavations at Burrill Lake in 1931 were considered to be less than ideal, with a large mesh size used to sieve significant amounts of deposit, and thus unlikely to capture smaller backed blades and other items. As a result, Lampert undertook additional excavations in 1967 to re-examine the deposit, including a sandy deposit which was initially considered to be sterile. Deposits within the shelter were dated to approximately 20,000 years ago. A range of mammals, birds, fish, and shell fish remains were identified, along with a range of stone tools.

At Currarong, three rock shelters were excavated. While artefactual deposit was recovered from all three, only Shelter 1 contained sufficient stone for detailed statistical analysis, with a two phase industrial sequence identified at the site. There was limited evidence to suggest that artefactual material was modified at the site. A number of bone and shell artefacts were also identified at the site. Human skeletal remains were also identified within Shelter 1, with three individuals identified.

Overall, both shelter sites were considered to be similarly situated, within sheltered wooded valleys with streams of fresh water nearby. Estuarine conditions are within close proximity to both shelter sites and provided resources. The assemblage was considered to “represent the activities of a group or groups of people who practised a mixed economy, exploiting the resources of land, estuary and sea-shore”. The activities at both sites were dated to commence approximately 20,000 years ago,

with a relatively continuous sequence of occupation through to the relative present. Three distinct phases of occupation were identified, considered to parallel McCarthy's Eastern Regional Sequence to an extent, albeit with some differences. The earliest phase was considered to be characterised by crude, amorphous scrapes, although some finely dentated saws were also identified from these early deposits. A second phase was considered to commence around 5,000 years ago which was characterised by more specific stone implement types, including backed blades such as Bondi points and geometric microliths, thumbnail scrapers and eloueras. The third phase was characterised by a reduction in backed blades and an increase in bipolar flaking technology. Overall, it was considered that the results from these excavations demonstrated that the archaeological record within south eastern NSW is a dynamic record, with 'culture centres' forming where similar changes in archaeological evidence were deposited in similar but spatially different sites.

Lampert & Steele 1993

Lampert and Steele undertook excavations within a rock shelter adjacent to Bomaderry Creek in 1970. Well preserved organic remains, including shell, bone, plant fibres and resin, were identified within the deposit, along with a range of stone artefacts. The rockshelter was formed from sandstone on the southern side of a steep-walled gully above Bomaderry Creek, and faces due north, allowing the site to be protected from strong winds and rain. The interior of the cave has a ceiling of up to 5.5m high and is sheltered by blocks of sandstone at the entry, allowing the shelter to remain cool on hot summer days. The shelter had a sandy base and flaked stone and blackened macropod bones, suggesting use of the shelter by Aboriginal people in the past.

The excavation revealed that occupation deposit was very shallow, extending no deeper than 40cm. The majority of artefacts were made from chert and reef quartz, with a small amount of silcrete, considered to have been transported from the Bendalong-Ulladulla region 45km to the south. A range of artefact types, including eloueras, flakes, scrapers, cores, backed blades, an edge ground axe, and other unmodified flakes were recorded within the site.

Based on the results of the assemblage assessment, it was concluded that Aboriginal people utilised the immediate environment to support themselves. There was evidence of preparation and consumption of food resources within the shelter itself, along with stone tool manufacture. Materials for stone tool manufacture were sourced from both the local environment and from distant locations. There was evidence of use of marine resources, despite being located approximately 12km inland. Much of the deposit appeared to be similar to that identified at Currarong and Burrill Lake rockshelters and suggested similar use of the landscape despite the spatial distance between the sites.

BOOT 2002

Phil Boot undertook a comprehensive academic study of the South Coast hinterland for his Doctorate. This extensive study focussed on the hinterland forested hills, mountains and plateaux located between the coastal lowlands and tablelands, and extends between the Pigeon House Range and the northern rim of the Bega Valley, inland to the Southern Tablelands, and by the narrow coastal lowland to the east.

As part of the fieldwork associated with his PhD, Boot undertook a large number of archaeological surveys, as well as systematic collections and excavations within the South Coast hinterland area. As a result, he found that the greatest density of archaeological sites were generally located in major river valleys and along broad ridgelines with access to water sources. In general, major river valleys exhibited overall higher artefact densities than that identified at other locations. The vast majority of evidence relating to Aboriginal occupation of the area comprised open artefact scatters and isolated artefacts. Between 72% and 82% of all artefact sites were located on ridge or spur crests, river terraces, and saddles, and river terraces were considered to be as vital a location for subsistence and habitation as the ridgelines (Boot 2002).

At least 82% of the open artefact scatter sites identified were located on level locations, suggesting that level areas were preferred for camping over even slight slopes.

CLARKE AND KUSKIE 2006

In 2006, Clarke and Kuskie developed a predictive model for the Shoalhaven region, based on resource zones. They described how the region could be divided into primary and secondary zones, defined as follows:

- Primary resource zones: “defined in terrain units in close proximity to the major Shoalhaven and Crookhaven Rivers. These zones have higher probability of containing evidence for a wide range of occupation types including congregations of large groups of people, community base camps, nuclear/extended family base camps, camping by small hunting groups and/or gathering (without camping) and transitory movement. Occupation is likely to have been regular and potential longer in duration in the primary zones” (Clarke and Kuskie 2006).
- Secondary resource zones: “defined in terrain units in close proximity to higher order creeks and/or wetlands, including Bomaderry, Mundamia, Calymea, Flat Rock, Bengalee and Sandy Creeks and their associated flats, slopes and terraces. These secondary zones have a high probability of containing evidence of nuclear/extended family base camps, camping by small and/or gathering parties, hunting and/or gathering (without camping) and transitory movement. Occupation is likely to have been sporadic and relatively short in duration in secondary zones” (Clarke and Kuskie 2006).

Outside the primary and secondary zones, terrain units distant from higher order creeks and/or wetlands were considered to have potential for evidence of occupation in the form of hunting and/or gathering (without camping) and transitory movement, sporadic and short in duration (Clarke and Kuskie 2006).

Site types such as rock shelters and axe grinding grooves occur relatively frequently within the Shoalhaven region, and are generally located in moderate to steep drainage depressions or spur crest units, and occasionally in gently sloping terrain containing suitable stone outcrops. Larger shelters located close to varied resources may have been utilised as base camps, and smaller shelters visited on an ad hoc basis. Art sites were likely to occur within contexts with suitable surfaces. Grinding grooves can occur in any area containing suitable stone outcrops, generally but not always sandstone, and often in close proximity to a water source (Clarke and Kuskie 2006).

4.5.2 Manyana and Surrounds

Attenbrow 1981

Attenbrow undertook an archaeological survey in advance of pipeline routes and reservoir sites as part of the proposed upgrade to the Shoalhaven water supply system. A section between Bendalong and Manyana Beach was inspected, with one site including shell midden identified. A number of shells were identified within loose sand eroding from the creek bank. A small section of the bank was cleaned back to confirm whether there was potential for in situ midden deposits to be present. At approximately 55cm below the surface, shell was identified in association with a band of grey sand approximately 20cm in depth. Charcoal was noted along with flaked stone. The horizontal extent of the buried midden was not established, although it was considered unlikely to extend far from the bank of the creek.

A cutting in the creek bank was noted for the construction of an existing pipeline crossing Manyana Creek. No midden material was identified within this cutting. Some fragmentary shell was noted within the track leading to the creek, and it was considered possible that the midden material had been located at depth in the area, and the construction of the pipeline had impacted the deposit. It was recommended that the proposed new pipeline should be located within the trench created for the existing pipeline which was to be replaced, as this was likely to cause the least further disturbance to the site. Overall, the site was considered to be typical of shell middens along the South Coast, with limited potential to provide information about the Aboriginal occupation of the region that was not available from other sources.

Lance 1987

Lance undertook an archaeology survey of a proposed electricity transmission line between Nowra and Ulladulla, with a number of artefact concentrations identified.

NAVIN 1992

Navin undertook an archaeological inspection in advance of the proposed construction of a camping ground. The site was located on the northern side of the Conjola Inlet, near Canada Street in Cunjurong. No sites were identified despite good surface visibility and it was assessed that the area contained a low potential for sites to be present, in line with the predictive model for the site.

PATON AND WOOD 1995

Paton and Wood prepared an assessment for a proposed water pipeline between Bamarang and Milton, with a number of artefact concentrations identified.

KUSKIE 1994-1995

Kuskie undertook a survey and later subsurface excavations within a large property to the south of Fishermans Paradise. An artefact scatter and isolated artefact were initially identified, with test excavations revealing a further 67 artefacts from two locations. Artefacts were predominantly formed from quartz and silcrete, with some siltstone, indurated mudstone and volcanics also identified.

KUSKIE 1997A

Kuskie undertook an assessment of 25km of road and power easements within the Cudmirrah National Park for NPWS, between Bendalong and Sussex Inlet. A total of fifteen artefact scatters and eight isolated artefacts were identified. Five of the sites were recorded as containing between 50 and 200 artefacts, generally manufactured from silcrete. A Plan of Management was prepared for the project.

KUSKIE 1998

Kuskie surveyed Portion 158 of the Parish of Conjola, located on the northern side of Conjola Inlet to the west of Berringer Lake. An artefact concentration had been recorded by Jerrinja LALC within the site. A total of 41 artefacts were originally recorded by the LALC, but Kuskie was only able to relocate several due to changed surface visibility conditions. Recommendations were made for the management of the sites.

NAVIN 1998

A number of areas were investigated as part of the proposed Conjola Sewerage Scheme, with a treatment plant and exfiltration sites proposed at Bendalong, south and west of Conjola Lake. An artefact scatter and a number of isolated artefacts were identified to the south and west of the lake, and another artefact scatter was identified during monitoring of geotechnical drilling in the area.

NAVIN OFFICER HERITAGE CONSULTANTS 2001

NOHC prepared an Environmental Impact Statement (EIS) for the proposed Conjola Regional Sewerage Scheme, during which a total of 22 artefact sites were identified, along with two areas of PAD and a number of areas recommended for monitoring. The assessment included the easement wherein Attenbrow identified the midden, which was relocated; and also surveyed the western side of Inyadda Drive, including

along the western boundary of the study area. No sites were identified along Inyadda Drive.

NAVIN OFFICER HERITAGE CONSULTANTS 2002

Subsequent to the preparation of their assessment for the proposed Conjola Regional Sewerage Scheme, minor modifications to the proposal required additional archaeological assessment. This included an alteration to the proposed location for the wastewater pump station at Manyana, which was moved approximately 50m to the southwest, with an approximate 400m^2 of vegetation clearance required within this area as part of the project.

A new site, CS19 – Inyadda Beach Carpark, was identified as a result of this assessment, comprising eight stone artefacts over approximately 60m along a foot track. No midden shell was noted within or near the site. Artefacts identified included a ground edge axe fragment among other items. Subsurface testing of the area was recommended or the movement of the proposed pump station to avoid the area of artefacts.

NAVIN OFFICER HERITAGE CONSULTANTS 2004

Additional design modifications to the Conjola Regional Sewerage Scheme required further assessment. This included a number of small amendments at North Bendalong, Bendalong, Manyana, Berringer Lake, Cunjurong Point, Lake Conjola, Conjola Park and Fishermans Paradise. A number of newly identified sites were recorded as a result of the survey and further assessment was recommended for a number of the sites within the study area.

NAVIN OFFICER HERITAGE CONSULTANTS 2005

NOHC undertook an ACHA of three lots proposed for subdivision within Manyana, within an area previously subdivided to support the proposed infill development of the area. Five new artefact concentrations were identified, and two previously recorded sites were relocated and reassessed. The study area was assessed as having further subsurface potential across much of the area and further archaeological assessment was recommended to allow investigation of the significance of these sites.

NAVIN OFFICER HERITAGE CONSULTANTS 2006

Navin Officer Heritage Consultants undertook test and salvage excavations at a number of locations associated with the Conjola Regional Sewerage Scheme, including at two sites on the eastern boundary of the current study area, being CS19 and 58-2-0241. Unfortunately, the previous test excavation report from 2005 was not available from AHIMS for review.

Three lithic items were recovered from CS19 as part of the test excavation program and were not considered to be artefactual. Additionally, surface collection at both sites was attempted. The salvage excavations recovered the smallest assemblage

of all the sites salvaged from site 58-2-0241. 90% of the assemblage comprised silcrete, with sandstone, chert, and volcanic stone also represented.

KELLEHER NIGHTINGALE CONSULTANTS 2008

Kelleher Nightingale Consultants (KNC) were engaged to undertake an assessment to inform an REF for the proposed Berrara to Manyana augmented water pipeline project. This included installation of an approximate 10km pipeline between Berrara and Manyana, passing along Inyadda Drive to the immediate west of the current study area.

Sites Berrara 02 and Berrara 03 were identified during the survey (among others) within relatively close proximity to the study area. Site B02 is located in the south western corner, just outside the study area itself, but is likely to extend into the study area.

It was noted that site 58-2-0337 extends along Inyadda Drive within the pipeline easement, but the report stated that "the portion that was within the proposed pipeline easement was observed to be highly disturbed with very low potential for intact archaeological deposits and correspondingly low research potential" (KNC 2008:20). It was noted that a Section 90 permit to impact the portion of site 58-2-0337 located within the pipeline easement along the road reserve.

NAVIN OFFICER HERITAGE CONSULTANTS 2008

NOHC were engaged to undertake the further investigations recommended in NOHC 2005 for a proposed subdivision in Manyana. 27 test pits were excavated using a backhoe with 479 lithic items recovered. The assemblage was predominantly formed of silcrete, quartz and basalt, with a number of manufacturing activities identified. The assemblage was considered to be microlithic and to date to the last 3,000 years, and overall was considered to be of low local scientific significance. No further assessment was recommended for the site.

4.5.3 PREVIOUS ASSESSMENT OF THE STUDY AREA

A number of archaeological assessments have been undertaken for the specific study area.

KUSKIE 1997B

Kuskie undertook an archaeological survey in 1997 and identified a number of sites, named Manyana 1 - 5. Manyana 1 comprised eight separate loci of varying densities of artefacts, and was considered to be one overall site with potentially high archaeological significance within a local context, due to the potential for substantially greater number of artefacts to be present along with subsurface deposits, some of which were considered to potentially be in situ.

Manyana 2-5 had relatively fewer artefacts identified on the surface, ranging from two to 16 individual items. All were identified on tracks or other disturbances within the study area, and outside of these highly disturbed areas of visibility,

archaeological visibility was virtually nil due to heavy vegetation cover. Sites 2 and 3 were considered to have moderate archaeological significance despite their relatively low numbers of artefacts (16 and two, respectively), as they were considered to have potential to be larger than immediately visible on the surface, with potential for subsurface deposits to be present. Sites 4 and 5 were considered to have low archaeological significance due to their low integrity and artefact numbers present. They were also not considered likely to have potential for subsurface deposits to be present due to the degree of disturbance present.

A previously recorded site, AHIMS #58-2-0241, was also noted to fall within the study area, comprising a shell midden with associated artefacts originally recorded by Dr Val Attenbrow. The site was located within an electricity transmission line easement which forms the eastern boundary of the study area, with the majority of the site extending for approximately 180m along the easement north from a small lagoon draining onto Manyana Beach; and then with a small portion extending to the south within the easement. At least 16 artefacts were recorded in association with the midden material on both sides of the lagoon (Kuskie 1997). This site falls just outside the study area boundary.

The site is located within the hind portion of the dune between the study area and the beach, and the Holocene dune is considered likely to contain subsurface archaeological deposits, particularly as artefacts were identified in association with the shell and charcoal of the midden. This potential is considered to extend over the same landform unit.

The development proposal assessed by Kuskie was significantly greater than that proposed as part of the current proposal, with the majority of the western portion of the study area proposed to be developed. Four options were presented for further management of the site, including destruction through application for a Consent to Destroy permit, conservation of part or all of the site, salvage works, or further investigation through test excavation to determine which of the three previous strategies would be most appropriate.

Overall, it was recommended that sites Manyana 4 and 5 could be impacted under a Consent to Destroy Permit, while Manyana 1-3 should be conserved at least in part. In the event conservation was not possible or feasible, further investigation was recommended for all three sites, as well as the previously registered site #58-2-0241. The sites were considered to hold value within the artefacts assemblage itself, and its research potential with regard to the Aboriginal habitation of the study area; along with the context of the sites themselves and their potential for in situ subsurface potential to be present.

ERM 2004

In 2004, ERM undertook a revised heritage survey as part of a Local Environmental Study to support the proposed rezoning of the current study area. During the survey

undertaken as part of the assessment, three of the six sites recorded by Kuskie (1997) and Attenbrow (1981) were relocated. Manyana 2, 3 and 5 were not relocated, although the site extent for Manyana 4 which was relocated was estimated to incorporate the original Manyana 5 location.

The shells originally recorded by Attenbrow as part of the midden deposit were not relocated in 2004 and it was considered that the shell may have been lost to erosion, although the stone artefacts were relocated. One new site was recorded, comprising a stone artefact concentration in the south eastern portion of the site.

Manyana 1 was estimated to cover an area of "18 hectares on the high ground of the property...and may spread westwards, as artefact densities are at their highest towards the west of the study area...The integrity of subsurface deposits throughout the majority of the site is unclear. There are areas of the site where the deposits have been heavily disturbed by 'motorbike parks' and by vehicle traffic along the dirt tracks throughout the property" (ERM 2004). It was further noted that "a total of 186 artefacts were recorded along transects...all the artefacts were found on the higher ground at the western end of the study area in between the two creeks feeding the lagoon in the east" (ERM 2004). Silcrete cobbles were noted to have been utilised to improve tracks to prevent or avoid bogging vehicles, and were considered likely to have been locally sourced cobbles.

It was considered that the disturbed areas associated with tracks were unlikely to have intact deposits present, but that there was potential for intact deposits within areas that had not been disturbed. It was also noted that the well drained, elevated ground in the west of the study area, as well as to the east of the study area boundary, contained large sites with high artefact densities; while the lower lying areas in the eastern portion of the study area contained very low density sites.

It was concluded that further investigation of the nature and extent of archaeological deposits would be required prior to impact occurring, and collection of surface artefacts within the impact area was suggested. Conservation of the site identified by Attenbrow (AHIMS #58-2-0241) was also recommended.

The locations of the sites identified by Kuskie were reassessed and the likely boundaries of the known sites were mapped (Figure 11).

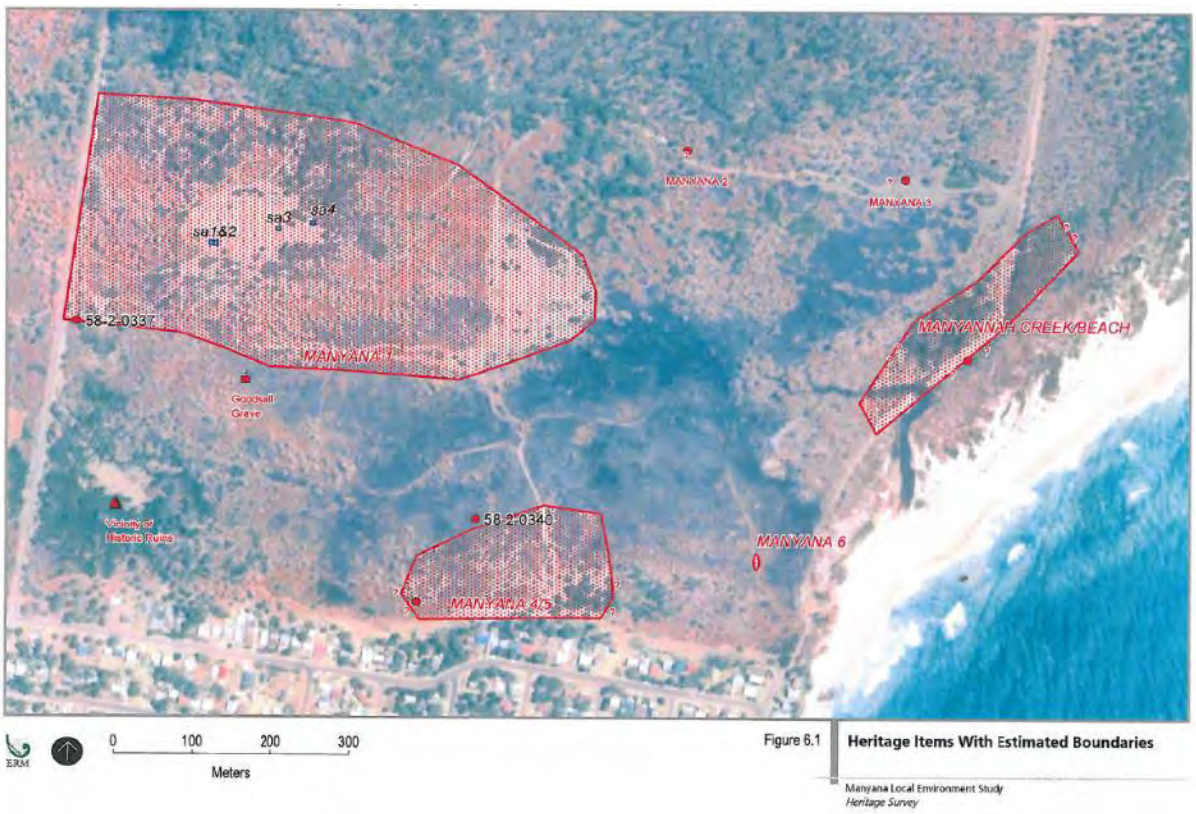

Figure 11: Reassessment of site extents by ERM. (Source: ERM 2004: Fig 6.1)

FEARY 2013

Feary prepared an assessment of a proposed shared pathway and footbridge between Bendalong and Manyana, running just outside the eastern boundary of the current study area from north to south. A total of 19 lithic items within 11 loci were identified as part of the assessment, with a number associated with site 58-2-0241 which had been previously subject to a Section 90 permit to destroy as well as test and salvage excavations. Very little evidence of shell midden material was noted during the inspection and comprised a few small fragments on the northern side of Inyadda Creek.

One new site, B2M1 (58-2-0438), was registered and subsequently partially destroyed following issue of an AHIP for the site, and it was recommended that the AHIP should also permit harm to any remaining artefacts associated with site 58-2-0241, despite having been previously impacted and subject to surface salvage as well as salvage excavations.

BAKER ARCHAEOLOGY 2013

Baker was involved in the original ERM assessment of the site in 2004, and was contacted in 2013 to provide further information regarding the site. He had reinspected the land in 2012 to confirm the ERM 2004 findings were still relevant. It was noted that the area of the site Manyana 1 was heavily disturbed and the site was not considered to warrant the moderate significance attributed to the site.

Further, it was considered that the site did not "demonstrably contribute significant new information about Aboriginal life. The sites do, however, demonstrate past Aboriginal use of the land" (Baker 2013). It was considered that Kuskie's assessment did not include specific research questions to support the assessment of the site as possessing moderate significance, and nor was evidence for representativeness of the site provided. It was concluded that "discovery value" was the basis of the significance assessment of the site.

Baker stated the following:

> *I have conducted more than 30 major archaeological excavations on comparable sites in other parts of NSW over the past 20 years. In my experience, archaeological test excavations of the type that Kuskie was recommending have the capacity for revealing the extent and character of stone artefact assemblages and significant spatial arrangements in those stone artefacts. It can be valuable to learn about the extent of stone artefacts where there is [sic] little to no surface exposures. However this entails a form of sampling through systematic test pits that requires comparable integrity across the land to ensure a consistent and valid sample. Significant ground disturbance compromises the integrity of a sample and renders the sample inconsistent and any scientific results suspect. I identified and documented the significant disturbance across the Kylor land and found that any scientific research value was low. Furthermore, I documented a number of studies that had be conducted in the local area, including one test excavation on an adjacent property by Kuskie himself, which demonstrates that artefacts on the Kylor land are not unique in their occurrence. Following Bowdler's method, I therefore revised down the assessment of the Aboriginal sites from moderate to low.*

It was noted that the artefacts were considered to be of socio-cultural value to the Aboriginal community.

All previous assessment known to have been undertaken within or adjacent to the study area are shown in Figure 12. Locations of previously identified archaeological sites within the study area are shown on Figure 13.

PO Box 236
NOWRA
NEW SOUTH WALES 2541

0 265 530

metres

Projection:
MGA Zone 56 (GDA 94)
Base Map:
NearMaps 2022
Image Date: 07/05/2022
Final - Version 1

Figure 12: Previous archaeological assessments within and adjacent to the study area.

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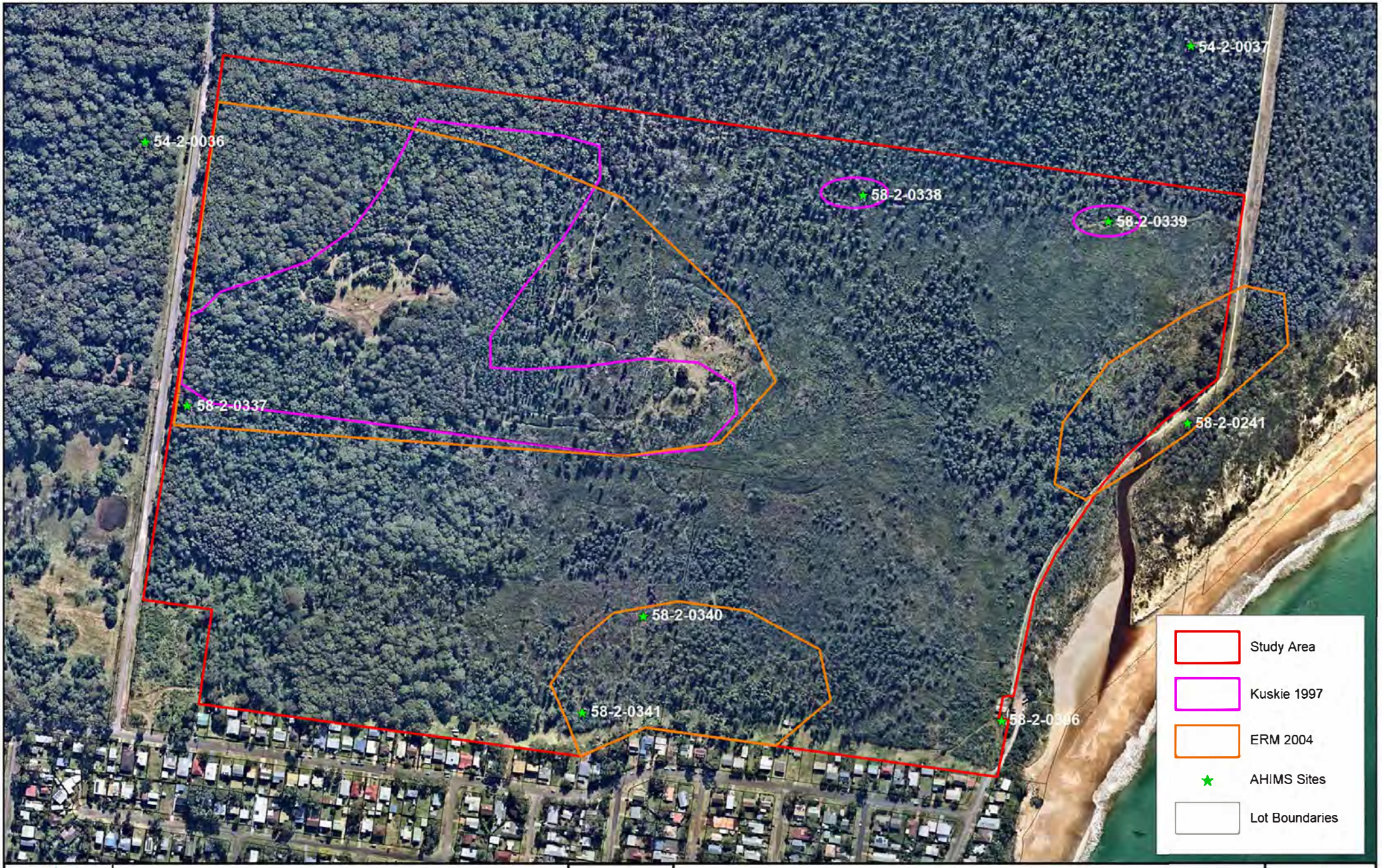

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NearMaps 2022
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Figure 13: Previously identified site boundaries within the study area.

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4.6 Predictive Model

Based on the results of previous archaeological investigations within the wider region, a number of predictions regarding Aboriginal use of the area can be made. These predictions focus on the nature, extent and integrity of the remaining evidence.

The landscape characteristics of the area influence the prediction of the nature of potential sites within the landscape itself. Disturbance is the predominant factor determining whether or not artefacts are likely to be identified within a landscape.

Surface sites are likely to have been impacted by agricultural processes and domestic land use within the area over the historic period. Natural actions such as bioturbation are likely to have impacted at least the upper levels of archaeological deposits, as are cultural activities such as excavation, construction, demolition, ploughing, clearing and planting. Whilst these actions may impact the integrity of stratigraphy within the deposit, this does not necessarily mean associated archaeological objects will also be disturbed.

In general, Aboriginal use of an area is based on a number of factors, such as:

- Proximity to permanent water sources – generally permanent or areas of repeat habitation are located within approximately 200m of permanent water;
- Proximity to ephemeral water sources – generally sites near ephemeral water sources were utilised for one-off occupation;
- Ease of travel – ridgelines were often utilised for travel during subsistence activities; and
- The local relief – flatter, more level areas were more likely to be utilised for long term or repeat habitation sites than areas of greater relief, especially if the slopes are at a distance from water.

Stone Artefacts

Stone artefacts can be identified on the ground surface or within subsurface deposits. Generally, artefact concentrations are representative of debris from knapping activities, which includes flakes, flake fragments, cores, and pieces likely to have been knapped but with no or inconclusive diagnostic features, referred to as flaked pieces. Modified artefacts can also be identified, including backed artefacts, scrapers, or edge ground axes, although these are generally a smaller proportion of the artefact assemblage. During excavation, very small debris (~3-5mm) can be identified within sieved material, and is referred to as debitage. This is indicative of in situ knapping activities.

As the detection of stone artefacts relies on surface visibility, factors such as vegetation cover can prevent their identification. Conversely, areas of exposure can assist in their identification. Within the study area, artefacts have been identified on

the ground surface, although vegetation cover has reduced the archaeological visibility within this area. It is possible additional artefacts, either in isolation or in concentrations, may be identified within the study area.

Quarry and Procurement

Exposures of stone which can be exploited for the production of lithics are referred to as quarries or procurement sites. Quarries generally have evidence of extraction visible, while procurement sites can be inferred through the presence of artefactual material made from raw material sources present within the area.

The study area is known to be in close proximity to silcrete sources, a popular raw material for the manufacture of artefacts. There is potential for either quarries or procurement sites to be present within the study area.

Middens

Middens are concentrations of shell, and may also contain stone artefacts, bone and sometimes human burials. These sites are generally recorded along coastal areas. Middens are formed through the exploitation of locally available species by humans for resources, and accumulation of the shell material within a specific location. Middens can range in size from small, discrete deposits, to deposits covering a large area.

Generally, middens reflect the species available in the local area. In estuarine regions, estuarine species will dominate the composition of the midden, while around headlands, rock platform species tend to dominate. Given the presence of rock platforms around the study area, and the previous identification of midden material immediately adjacent to the study area, there is potential for midden material to be present within the sandy landforms along the eastern boundary. However, midden material is not anticipated to occur within other landforms within the study area.

Burials

Aboriginal people across Australia utilised a range of burial forms, which depended on the customs of the individual tribes. Common burial practices included inhumation, cremation, desiccation and exposure. Burials are known to occur within sandy contexts in the wider region. These are generally found within coastal Holocene sand bodies, and generally are not identified during field survey as there is usually minimal surface expression of this type of site.

To date, there are no records of Aboriginal burials being identified within the specific study area, but this does not preclude burials from occurring. However, the soil within the western portion of the study area appears to be more of a loam rather than a sandy deposit; while the majority of the eastern portion is a backswamp area unlikely to have been utilised for burials, and based on the available information, burials are not expected to occur within the study area. Burials are considered more likely within the dunes between the study area and the ocean to the east.

Rock Shelters

Rock shelters are formed by rock overhangs which would have provided shelter to Aboriginal people in the past. Often, evidence of this occupation can be found in the form of art and/or artefacts. Shell, midden material, grinding grooves, pictographs (rock engravings), artworks including stencils and paintings, and potential archaeological deposits (PAD) are common features of rock shelter sites.

There are no known rock overhangs within the study area likely to contain rock shelters, and thus this site type is considered unlikely to occur.

Grinding Grooves

Grinding grooves are formed on sandstone exposures through the creation and maintenance of ground edge tools, such as axes and spears. Usually, stone was ground to form a sharp edge, although bone and shell were also ground to create sharp points.

Generally, fine grained sandstone was favoured for these maintenance activities, and the presence of a water source nearby or overflowing the sandstone was also favoured. Grinding grooves range from individual examples through to hundreds of grooves within an area, sometimes arranged in a specific pattern. Horizontal sandstone was generally preferred, although there are examples of vertical grooves.

There are no known sandstone outcrops within the study area and thus this site type is considered unlikely to be present.

Scarred and Carved Trees

Scarred and carved trees are created during the removal of back from a tree for a range of reasons, both domestic and ceremonial. This type of site can be identified within areas containing trees of the correct species and appropriate age. Deliberately scarred trees can be difficult to differentiate from naturally occurring damage to trees, and specific criteria must be considered when assessing a scar for a cultural origin.

Given the level of historical clearance and bushfires that have impacted the area in the past, the likelihood of culturally scarred trees remaining within the study area is considered extremely low.

Ceremonial Sites

Specific places were used for ritual and ceremonial purposes, including initiation and burial practices. Secret rituals were also undertaken at specific places by specific individuals, such as at water holes and by clever men.

The landscape itself was also considered to hold significance to Aboriginal people, and the understanding of this is referred to as a sacred geography. This includes natural features which were associated with spirits or creation beings. The meaning attributed to the landscape provided Aboriginal people with legitimacy regarding

their role as guardians of the places which had been created by the spiritual ancestors (Boot 2002).

Many areas along the South Coast of NSW are considered to be sacred to the original inhabitants. There are no known recorded areas within the study area, although this does not preclude these values from existing within this location.

Contact Sites

Contact sites contain evidence of Aboriginal occupation concurrent with initial colonisers in an area. This could include evidence such as flaked artefacts formed on glass, or burials containing non-Aboriginal grave goods. Often Aboriginal camps would form around newly built towns, allowing for employment (or exploitation) of the Aboriginal people by the colonists, and also for trade to exist between the two communities. Contact sites can also occur around Aboriginal mission sites, where Aboriginal children were taken from their families to raise in the European manner. Families often camped around the mission boundaries to try to catch a glimpse of their children.

There is no known evidence of initial contact between Aboriginal people and colonists within the study area, although it may have been possible. The probability of evidence of contact sites occurring within the study area is considered low.

Summary

In terms of the study area, sites are considered more likely to comprise stone artefact concentrations or isolated finds. There is also potential for quarry or procurement sites to be present.

5.0 Field Work

5.1 Sampling Strategy

Apex Archaeology prepared a detailed methodology for field survey, which was provided to the RAPs for their review and comment as discussed in Section 3.3 above. This methodology takes into account total survey coverage for the proposed impact areas. The methodology is attached as Appendix E of this report.

5.2 Site Inspection

A survey was undertaken on 6 and 8 September 2021 by Apex Archaeology as part of the assessment under the Code of Practice and ACHCRs.

Participants in the survey included:

- Leigh Bate, Apex Archaeology
- Bonnie Clarke, Apex Archaeology
- Charles Gardiner, Jerrinja Local Aboriginal Land Council
- Tim Williams, Jerrinja Local Aboriginal Land Council
- Toby Wellington, Jerrinja Local Aboriginal Land Council
- Yeena Connolly, Jerrinja Local Aboriginal Land Council

5.3 Survey Coverage

The study area (comprising the proposed development area only) was surveyed in one pedestrian transect (Table 5 & Figure 14) across four landform elements (Table 6) by the six survey participants. Each participant was responsible for inspecting a 2m wide portion of the transect walked. This meant that on each pass an area covering 4m would be observed for archaeological material. However due to the restrictive nature of the area given intense vegetative regrowth after the Black Summer 2020 fires, only accessible 4WD/motorbike tracks within the central portion and less vegetated areas within the western portion of the study area were surveyed.

Table 5: Survey transects

Transect	Landform Element	Number of participants	Total Length
1 (IDM01)	Spur crest	6	899m
2 (IDM02)	Gentle simple slope	6	1264m
3 (IDM03)	Drainage line/Gentle simple slope	6	156m
4 (IDM04)	Flat	6	577m

Table 6: Survey Transect Waypoints

Waypoint	Easting	Northing	Zone	Datum
1	274168	6096316	56	GDA
2	274173	6096361	56	GDA
3	274221	6096382	56	GDA
4	274242	6096389	56	GDA
5	274256	6096390	56	GDA
6	274262	6096398	56	GDA
7	274259	6096407	56	GDA
8	274263	6096445	56	GDA
9	274270	6096458	56	GDA
10	274268	6096470	56	GDA
11	274277	6096485	56	GDA
12	274269	6096498	56	GDA
13	274287	6096501	56	GDA
14	274326	6096501	56	GDA
15	274339	6096478	56	GDA
16	274252	6096410	56	GDA
17	274344	6096390	56	GDA
18	274335	6096378	56	GDA
19	274295	6096347	56	GDA
20	274279	6096353	56	GDA
21	274246	6096337	56	GDA
22	274189	6096315	56	GDA
23	274195	6096301	56	GDA
24	274193	6096287	56	GDA
25	274197	6096270	56	GDA
26	274206	6096267	56	GDA
27	274220	6096277	56	GDA
28	274234	6096276	56	GDA
29	274263	6096266	56	GDA
30	274288	6096263	56	GDA
31	274365	6096277	56	GDA
32	274375	6096277	56	GDA
33	274395	6096283	56	GDA
34	274415	6096276	56	GDA
35	274436	6096281	56	GDA
36	274423	6096302	56	GDA
37	274452	6096332	56	GDA
38	274454	6096340	56	GDA
39	274448	6096359	56	GDA
40	274446	6096387	56	GDA
41	274452	6096410	56	GDA
42	274443	6096407	56	GDA
43	274416	6096383	56	GDA
44	274419	6096355	56	GDA
45	274407	6096329	56	GDA
46	274415	6096310	56	GDA
47	274450	6096284	56	GDA
48	274482	6096270	56	GDA
49	274516	6096262	56	GDA
50	274516	6096209	56	GDA

Waypoint	Easting	Northing	Zone	Datum
51	274544	6096205	56	GDA
52	274565	6096215	56	GDA
53	274575	6096238	56	GDA
54	274598	6096238	56	GDA
55	274607	6096242	56	GDA
56	274623	6096263	56	GDA
57	274593	6096284	56	GDA
58	274544	6096324	56	GDA
59	274523	6096318	56	GDA
60	274520	6096278	56	GDA
61	274510	6096255	56	GDA
62	274459	6096179	56	GDA
63	274415	6096184	56	GDA
64	274383	6096186	56	GDA
65	274347	6096192	56	GDA
66	274311	6096191	56	GDA
67	274275	6096201	56	GDA
68	274219	6096212	56	GDA
69	274169	6096231	56	GDA
70	274164	6096246	56	GDA
71	274172	6096269	56	GDA
72	274186	6096287	56	GDA
73	274176	6096311	56	GDA
74	274145	6096107	56	GDA
75	274138	6096012	56	GDA
76	274119	6095934	56	GDA
77	274099	6095883	56	GDA
78	274071	6095887	56	GDA
79	274002	6095883	56	GDA
80	274263	6095852	56	GDA
81	274388	6095843	56	GDA
82	274413	6095852	56	GDA
83	274441	6095842	56	GDA

During the survey completed by Apex Archaeology the study area was inspected for Aboriginal archaeological evidence. An assessment of landform element and slope was made for the study area, with the results presented in Table 7.

Table 7: Survey area results

Survey Area #	Landform Element	Slope	Vegetation	Detection Limiting Factors	Ground Disturbance
IDM01	Spur crest	Gentle (>1.45°-5.45l°)	Cleared (Regrowth/Extensive disturbance)	vegetation/leaf litter/grass/rubbish/building waste	High
IDM02	Gentle simple slope	Gentle (>1.45°-5.45l°)	Cleared (Regrowth/Extensive disturbance)	vegetation/leaf litter/grass/rubbish/building waste	High

Survey Area #	Landform Element	Slope	Vegetation	Detection Limiting Factors	Ground Disturbance
IDM03	Drainage line/Gentle simple slope	Gentle (>1.45°-5.45l°)	Cleared (Regrowth/Extensive disturbance)	vegetation/leaf litter/grass/rubbish/building waste	High
IDM04	Flat	Level-very gentle (<1.45°)	Cleared (Regrowth/Extensive disturbance)	vegetation/leaf litter/grass/rubbish/building waste	High

The total survey coverage (meaning the areas physically inspected for archaeological evidence) was approximately 17,376m^2. The total area of the development impact is approximately 327,600m^2. A range of factors were considered and recorded during the survey, including the surface visibility (percentage of bare ground within a survey unit); archaeological visibility (amount of bare ground within an area in which artefacts could be expected to be identified if present); exposure type (A or B soil horizon) and calculations of how effective the survey coverage was. The results of the survey coverage are presented in Figure 14.

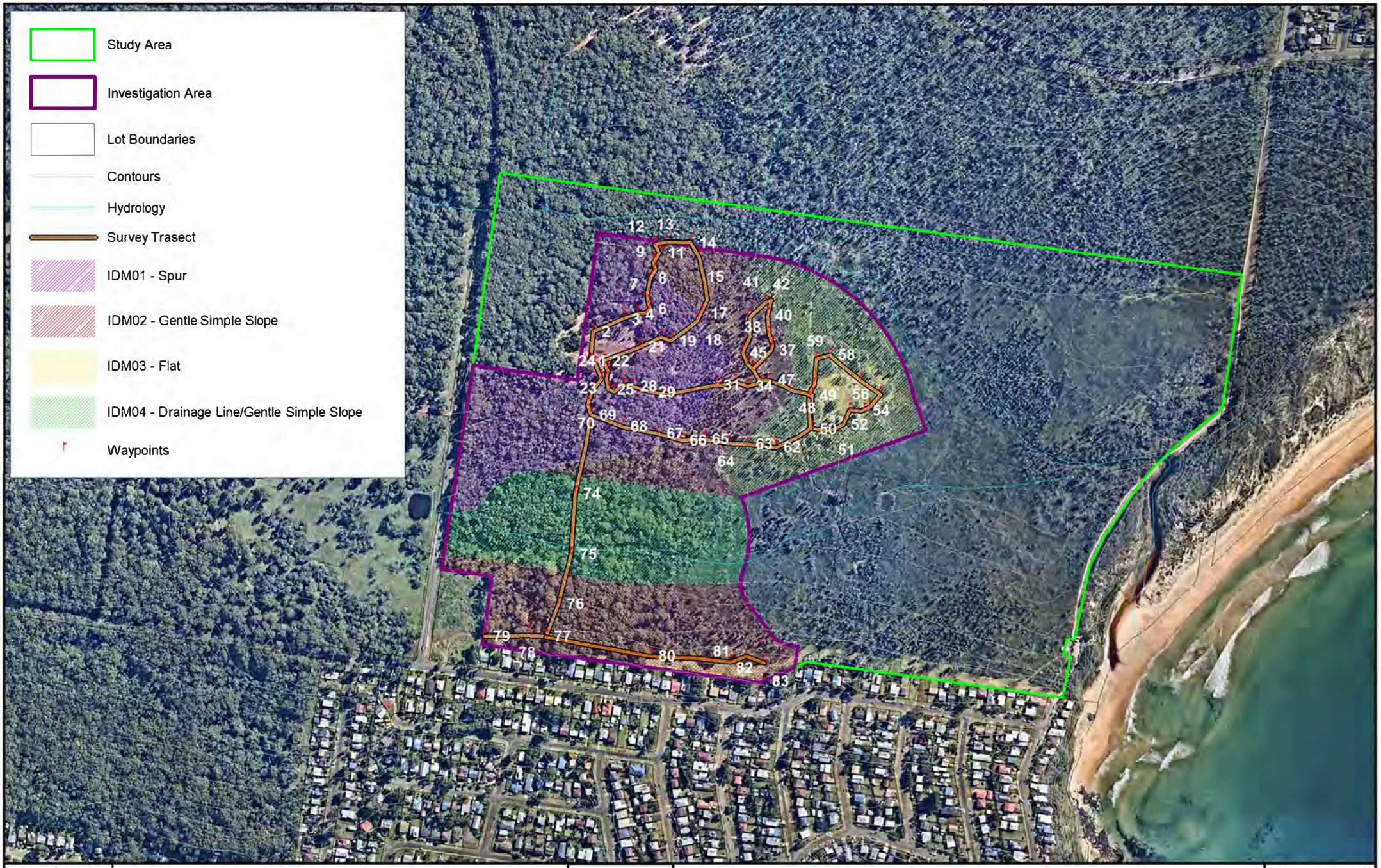
Table 8: Survey coverage results

Survey Area #	Total Area Surveyed (m²)	Surface Visibility (%)	Arch Vis (%)	Exposure Type (A/B)	Effective Coverage (m²)	% Effective Survey Coverage of Context
IDM01	5394m	80	50	A and B	2157.6	40
IDM02	7584m	80	20	A and B	1213.44	16
IDM03	936m	50	10	A	46.8	5
IDM04	3462m	80	20	A	553.92	16

Surface visibility across the study area accessible was fairly high due to the ongoing disturbance activities (4WD and motorbike riding). The majority of the area was inaccessible due to vegetative regrowth. Total effective survey coverage for the entire study area was 5.3% (Table 9).

Table 9: Total effective survey coverage results

Survey Area #	Total Area of Study Area (m²)	Total Area Surveyed (m²)	Effective Coverage of survey area (m²)
IDM1-4	327600	17376	5.30



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Projection:
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Near Maps 2021
Image Dtae: 01/04/2021
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Figure 14: Survey transects and units within the investigation area

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5.4 Survey Results

The study area was noted to be consistently and heavily disturbed through various landuse practices (illegal dumping of rubbish, building waste, excavation of material and burial of bottles and asbestos). More recently 4WD and motorbike activities have significantly disturbed the landscape, with numerous tracks visible throughout the study area, and in open areas it is clear that vehicles have driven over much of the area (see Plate 11 and Plate 17 for example).

It is clear that areas have been impacted through continual vehicular access, particularly when accessed during periods where the site is wet or waterlogged. Access at these times would have resulted in further churning of the surface, especially where the vehicles have not followed a single track but rather driven over the entirety of the open area.

Plate 9: General view of extensive semi-buried bottle dump within the central portion of the study area spur.

Plate 10: General view north across modified 4WD/motorbike race track within the central (spur) area.

Plate 11: Western portion in the lower lying swampy area (high levels of ground disturbance and dumped cars)

Plate 12: Looking northwest across open area within the central portion (highly disturbed land surface).

Plate 13: Looking west across 4WD track with significant erosion.

Plate 14: Looking north east across 4WD track with total vegetative regrowth either side of track preventing any access off the track.

Plate 15: Looking west across the open western area along the spur showing remnant race track.

Plate 16: 4WD ruts from recent activity (heavily disturbed and modified area).

Plate 17: Central portion of site looking north east across the spur. Burnt car bodies and high levels of ground surface disturbance throughout the area.

Plate 18: Looking at the ground surface within the accessible portion of the forested area just below the spur (building waste and asbestos scattered throughout).

Plate 19: Further detail of the ground surface within the accessible portion of the forested area just below the spur (building waste and asbestos scattered throughout)

Plate 20: Looking west across the open area. within the central portion (area highly disturbed throughout).

Plate 21: Looking across approximate location of site 58-2-0341 (area highly disturbed throughout).

5.5 Additional Survey Results

In addition to the above, a further survey of the study area was undertaken in July 2022 to include the area proposed to be established as a community title lot for conservation purposes. Photographs including scales as required by Heritage NSW were taken at this time.

It was noted that subsequent to the Black Summer Bushfires of 2019/2020, followed by unprecedented rainfall events, significant vegetation regrowth has occurred within the eastern portion of the study area and much of the community title lot was inaccessible. As such, the locations of previously recorded sites could not be resurveyed and assessed as they could not be inspected.

A number of artefacts were identified within highly disturbed eroded vehicle tracks (Plate 30 & Plate 33) which are associated with site 58-2-0337. The artefacts were interpreted as having washed into the eroded sections of trail due to the extreme rain events of early 2022.

Artefacts were also identified within the proposed fire trail along the southern boundary of the site and were considered to relate to site 58-2-0341 (Plate 40).

Despite the additional disturbance from public access to the site during and following the extreme rain event, surface artefacts were visible across many of the areas containing exposures.

Plate 22: Disturbance from water due to severe rain, eroding existing tracks formed by motorcycles.

Plate 23: Recent regrowth within study area following Black Summer bushfires then extreme rain events.

Plate 24: Disturbance from vehicle tracks and associated erosion.

Plate 25: Disturbance from vehicle tracks and associated erosion.

Plate 26: Sheet wash after extreme rain events.

Plate 27: Erosion and depth of existing vehicle track within central portion of development area.

Plate 28: Depth of berm created by vehicle track in central portion of development area.

Plate 29: Significant erosion and disturbance along existing vehicle track.

Plate 30: Artefact identified within severely eroded vehicle track, located by yellow flag; likely to have been washed in by rain.

Plate 31: Silcrete core identified within eroded vehicle track.

Plate 32: Further evidence of artefacts within eroded vehicle track.

Plate 33: Retouched silcrete flake identified within eroded vehicle track.

Plate 34: Dense regrowth within central portion of study area.

Plate 35: Significant disturbance to existing trail within central eastern portion of site; trail impassable.

Plate 36: Sheet wash across existing disturbed area.

Plate 37: Flooding and additional disturbance along existing trail.

Plate 38: North eastern section of study area underwater following extreme rain.

Plate 39: View along proposed fire trail at rear of existing dwellings along Curvers Drive.

Plate 40: Artefacts identified along proposed fire trail; associated with #58-2-0341.

Plate 41: Artefacts identified along main entry to site from Inyadda Drive.

Plate 42: Significant disturbance within site.

5.6 Additional Survey Coverage

The study area (comprising the accessible area within the proposed community title lot and previously surveyed portions within the development footprint) was surveyed in one pedestrian transect (Table 5 & Figure 14) across four landform elements (Table 6) by the two survey participants. Each participant was responsible for inspecting a 2m wide portion of the transect walked. This meant that on each pass an area covering 4m would be observed for archaeological material. However due to the restrictive nature of the area given intense vegetative regrowth after the Black Summer 2020 fires along with intensive weather events over the last 12 months which have caused flooding and sheet wash, only accessible 4WD/motorbike tracks were surveyed. Areas outside of existing tracks were generally impassable due to vegetation cover, which was often more than head high and impenetrable.

Table 10: Survey transects

Transect	Landform Element	Number of participants	Total Length
1 (IDM01)	Spur crest	2	585
2 (IDM02)	Gentle simple slope	2	1000
3 (IDM03)	Drainage line/Gentle simple slope	2	209
4 (IDM04)	Flat	2	1094

Table 11: Survey Transect Waypoints

Waypoint	Easting	Northing	Zone	Datum
1	273,986.00	6,096,297.23	56	GDA
2	274,186.00	6,096,287.00	56	GDA
3	274,205.04	6,096,317.26	56	GDA
4	274,246.00	6,096,337.00	56	GDA
5	274,295.00	6,096,347.00	56	GDA
6	274,358.88	6,096,312.14	56	GDA
7	274,379.39	6,096,312.14	56	GDA
8	274,407.00	6,096,329.00	56	GDA
9	274,414.81	6,096,371.80	56	GDA
10	274,443.00	6,096,407.00	56	GDA
11	274,485.47	6,096,469.31	56	GDA
12	274,547.18	6,096,478.08	56	GDA
13	274,593.79	6,096,476.21	56	GDA
14	274,666.51	6,096,451.98	56	GDA
15	274,925.66	6,096,429.60	56	GDA
16	274,975.99	6,096,410.96	56	GDA
17	275,020.74	6,096,420.28	56	GDA
18	275,121.41	6,096,422.14	56	GDA
19	275,153.11	6,096,427.74	56	GDA
20	275,186.67	6,096,418.41	56	GDA
21	275,160.03	6,096,242.73	56	GDA
22	275,108.36	6,096,211.47	56	GDA
23	275,041.25	6,096,155.54	56	GDA
24	274,948.03	6,096,013.85	56	GDA
25	274,904.66	6,095,800.38	56	GDA
26	274,662.77	6,095,840.46	56	GDA

Waypoint	Easting	Northing	Zone	Datum
27	274,653.45	6,095,887.07	56	GDA
28	274,634.81	6,095,916.89	56	GDA
29	274,593.79	6,095,944.86	56	GDA
30	274,545.52	6,096,056.83	56	GDA
31	274,547.18	6,096,090.29	56	GDA
32	274,481.93	6,096,192.83	56	GDA
33	274,347.00	6,096,192.00	56	GDA
34	274,179.90	6,096,235.71	56	GDA
35	274,146.34	6,096,274.86	56	GDA

During the survey completed by Apex Archaeology the study area was inspected for Aboriginal archaeological evidence. An assessment of landform element and slope was made for the study area, with the results presented in Table 12.

Table 12: Survey area results

Survey Area #	Landform Element	Slope	Vegetation	Detection Limiting Factors	Ground Disturbance
IDM01	Spur crest	Gentle (>1.45°-5.45l°)	Cleared (Regrowth/Extensive disturbance)	vegetation/leaf litter/grass/rubbish/building waste	High
IDM02	Gentle simple slope	Gentle (>1.45°-5.45l°)	Cleared (Regrowth/Extensive disturbance)	vegetation/leaf litter/grass/rubbish/building waste	High
IDM03	Drainage line/Gentle simple slope	Gentle (>1.45°-5.45l°)	Cleared (Regrowth/Extensive disturbance)	vegetation/leaf litter/grass/rubbish/building waste	High
IDM04	Flat	Level-very gentle (<1.45°)	Cleared (Regrowth/Extensive disturbance)	vegetation/leaf litter/grass/rubbish/building waste	High

The total survey coverage (meaning the areas physically inspected for archaeological evidence) was approximately 11,552m^2. The total area of the study area is approximately 769,500m^2. A range of factors were considered and recorded during the survey, including the surface visibility (percentage of bare ground within a survey unit); archaeological visibility (amount of bare ground within an area in which artefacts could be expected to be identified if present); exposure type (A or B soil horizon) and calculations of how effective the survey coverage was. The results of the survey coverage are presented in Figure 14.

Table 13: Survey coverage results

Survey Area #	Total Area Surveyed (m²)	Surface Visibility (%)	Arch Vis (%)	Exposure Type (A/B)	Effective Coverage (m²)	% Effective Survey Coverage

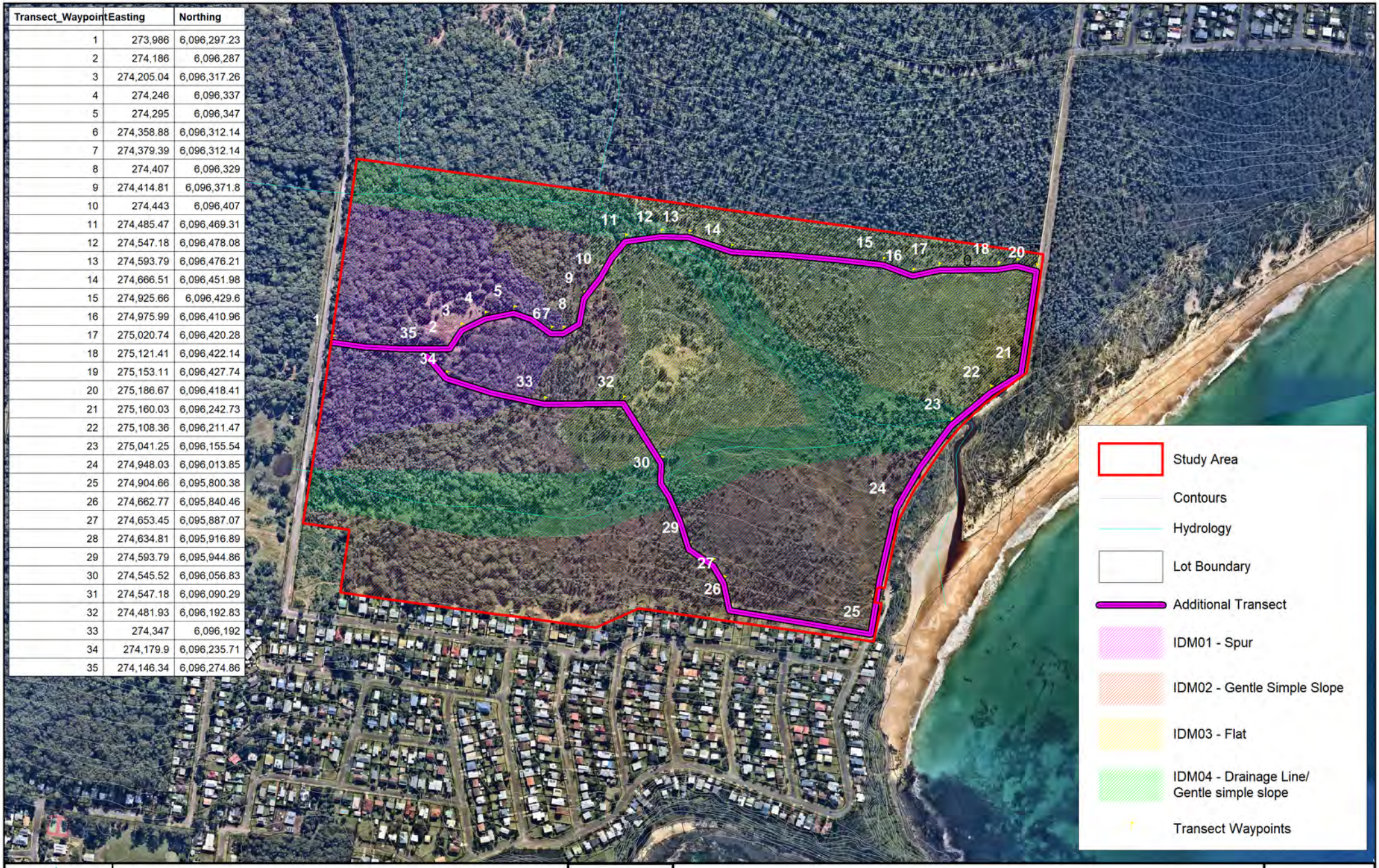
						of Context
IDM01	2340m	80	50	A and B	936	40
IDM02	4000m	80	20	A and B	640	16
IDM03	836m	50	10	A	41.8	5
IDM04	4376m	80	20	A	700.16	16

Surface visibility across the study area accessible was fairly high due to the ongoing disturbance activities (4WD and motorbike riding). The majority of the area was inaccessible due to vegetative regrowth. Total effective survey coverage for the entire study area was 1.5% (Table 9).

Table 14: Total effective survey coverage results

Survey Area #	Total Area of Study Area (m^2)	Total Area Surveyed (m^2)	Effective Coverage of survey area (m^2)
IDM1-4	769,500	11,552	1.5

Transect_Waypoint	Easting	Northing
1	273,986	6,096,297.23
2	274,186	6,096,287
3	274,205.04	6,096,317.26
4	274,246	6,096,337
5	274,295	6,096,347
6	274,358.88	6,096,312.14
7	274,379.39	6,096,312.14
8	274,407	6,096,329
9	274,414.81	6,096,371.8
10	274,443	6,096,407
11	274,485.47	6,096,469.31
12	274,547.18	6,096,478.08
13	274,593.79	6,096,476.21
14	274,666.51	6,096,451.98
15	274,925.66	6,096,429.6
16	274,975.99	6,096,410.96
17	275,020.74	6,096,420.28
18	275,121.41	6,096,422.14
19	275,153.11	6,096,427.74
20	275,186.67	6,096,418.41
21	275,160.03	6,096,242.73
22	275,108.36	6,096,211.47
23	275,041.25	6,096,155.54
24	274,948.03	6,096,013.85
25	274,904.66	6,095,800.38
26	274,662.77	6,095,840.46
27	274,653.45	6,095,887.07
28	274,634.81	6,095,916.89
29	274,593.79	6,095,944.86
30	274,545.52	6,096,056.83
31	274,547.18	6,096,090.29
32	274,481.93	6,096,192.83
33	274,347	6,096,192
34	274,179.9	6,096,235.71
35	274,146.34	6,096,274.86



PO Box 236
NOWRA
NEW SOUTH WALES 2541

0 350 700
metres

Projection:
MGA Zone 56 (GDA 94)
Base Map:
NearMaps 2022
Image Date: 07/05/2022
Final - Version 1

Figure 15: Additional survey transect and units within the study area.

N

5.7 Test Excavation Results

Previous assessment of the site had noted the potential for subsurface archaeological deposits to be present within the area, although it was also noted that the area was considerably disturbed. It was assessed that there was some potential for less disturbed areas to be present which may have provided additional information about the nature of the archaeological resource within the area and that further investigation prior to impact was necessary. As a result, a further ACHA was required as part of the project assessment, and test excavations to determine the nature and extent of these deposits was considered necessary.

Notification of the commencement of test excavations was provided to HNSW on 19 August 2021 for commencement on 6 September 2021, providing the required 14 days' notice prior to the commencement of works. This was in accordance with Requirement 15c of the Code of Practice.

Participants in the test excavation program included:

- Leigh Bate, Apex Archaeology
- Bonnie Clarke, Apex Archaeology
- Jenni Bate, Apex Archaeology
- Charles Gardiner, Jerrinja Local Aboriginal Land Council
- Tim Williams, Jerrinja Local Aboriginal Land Council
- Toby Wellington, Jerrinja Local Aboriginal Land Council
- Yeena Connolly, Jerrinja Local Aboriginal Land Council

A total of 36 50 x 50cm test pits were excavated across the area considered to have potential for subsurface deposits to be present, with four of these expanded into 1m^2 test pits due to artefact numbers; resulting in a total of 48 50 x 50cm test pits excavated (Figure 16). A total of 42 artefacts were recovered from the test excavations, with 32 recovered from the initial test pits and a further 10 recovered from the expansion pits. Further details of the lithic analysis can be found in Section 6.0.

Test pits reached a maximum depth of 25cm, although most were less than 10cm depth before reaching clay.

Soils generally conformed to the soil description within section 4.1 and profiles revealed extensive disturbance throughout the majority of the test pits. Generally, soils comprised a shallow humic layer immediately followed by a clay loam with increasing clay and ironstone gravel content until sticky compact clay was reached. Some small ferro manganese inclusions within the interface between the A and B horizon showing evidence of podzolization leaching the iron oxides from the substrate. Munsell results for spit 1 of the first test pit were 7.5YR 2.5/2 very dark brown, with a pH of 6; and the base Munsell results at approx 18cm were 5YR 2.5/2 dark reddish brown, with a pH of 5.5. This means soils are slightly acidic, resulting in sub-optimal preservational conditions for organic items such as shell, bone or wood. Photographs of all test pits are attached as Appendix H.

PO Box 236
NOWRA
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meters

Projection:
MGA Zone 56 (GDA 94)
Base Map:
NearMaps 2021
Image Date: 01/04/2021
Final - Version 1

Figure 16: Test pit layout within study area.

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5.8 Discussion

The survey confirmed that moderate to high levels of surface disturbance have occurred across much of the proposed development area within the overall study area; however, given the numbers of surface artefacts originally recorded, it is noted that these must have gone somewhere during the intervening years. As there is no record of archaeological collection being undertaken within the site, it is likely that these items have been churned into the soil through various disturbance actions.

Surface artefacts were noted throughout the open area on the spur crest, as well as down the gentle slope where they had likely moved due to sheet wash and taphonomic processes, especially disturbance from vehicles. More than 100 artefacts were estimated to be located on the surface of this area. These artefacts are located within the originally assessed area of Manyana 1 and are considered likely to be the items originally recorded by Kuskie in 1997.

Several large cobbles of silcrete were noted within the study area, at least one of which had evidence of flaking. These have been used to form borders, potentially for race track delineation, and were likely sourced from the nearby silcrete source at Red Head. The cobbles had also been placed within the tracks, potentially to attempt to prevent bogging of vehicles.

The subsurface test excavations confirmed the high levels of disturbance across the area. Test pits were proposed to be undertaken on a grid system within the area proposed for disturbance through the development. However, conditions in the field made this almost impossible due to the level disturbance and regrowth within the area, and test pits were located in areas where it was possible to place a test pit.

Further, it was noted that the swampy area to the east was highly unlikely to contain deposits due to the levels of disturbance present, along with the damp nature of the area being unlikely to have been utilised for habitation purposes in the past. This area was not considered to comprise PAD and as such, was not subject to test excavation.

Generally, the soil profile within the study area was shallow, with the deepest test pit reaching 25cm. The majority of test pits terminated at between 5 and 10cm depth. Disturbance was noted within all test pits. Artefacts were generally located within the upper 5cm, with only a few items located below this depth.

It is likely that significant additional disturbance has occurred since the site Manyana 1 was originally recorded by Kuskie in 1997, leading to areas that may once have been more intact no longer maintaining their integrity.

6.0 Lithic Analysis

This section outlines the results of the lithic analysis, and has been prepared by Dr Beth White of Beth White Archaeology.

This report provides an analysis of Aboriginal stone artefacts from test excavation at Inyadda Drive, Manyana near Lake Conjola. A total of 42 silcrete artefacts were recovered, together with 26 pieces of non-artefactual silcrete. The testing and artefact recording was conducted under the Code of practice for archaeological investigation of Aboriginal objects in New South Wales (DECCW 2010).

The Code of Practice sets out various requirements relating to stone artefacts of which requirements 18, 19 and part of 26 apply directly to stone artefacts:

- Requirement 18 includes identifying the types of activities which were conducted and evidence for technological change over time (see below sections 6.1.1 and 6.1.2),
- Requirement 19 states that artefact attributes to be recorded are those on the DECCW AHIMS artefact recording form. The methods used to record artefacts and meet this requirement are described in Appendix I.

Requirement 26 states that a full catalogue of artefacts should be prepared, including photographic and drawn records for diagnostic stone artefacts if the artefacts are to be reburied. The catalogue is included in Appendix J. Photographs, and drawings of a backed artefact, are included in the body of this report. All photographs have been taken with a 10mm scale in 1mm increments. Requirement 26 also specifies the long-term conservation of artefacts; artefacts were bagged and labelled accordingly.

6.1 Requirement 18 – Activities and Technological Change

6.1.1 Activities - Requirement 18

Stone artefacts resulted from sequences of actions from when a person first picked up a rock including transport, reduction, use and discard of stone. Artefacts could have been subject to further actions after discard, e.g. trampling, burning, burial or perhaps recycling. The nature of activities could have varied, potentially resulting in the discard of different numbers artefacts and artefacts with different attributes (Vaquero et al. 2012; Way 2018; White 2012). Literature review has previously identified the following kinds of activities which involved and/or produced stone artefacts: procurement of stone at its source (e.g. a quarry), carrying stone to sites (transport), heat treatment to improve the flaking qualities of the stone, reduction of cores to produce flakes, production of shaped tools, hafting, tool use, maintenance (retouching) of tool edges, stockpiling, storage (or caching), recycling (reuse of previously discarded stone) and discard (White 2012). The nature of activities could be identified by technical attributes of artefacts and manuports, and by their context – where they occur and the nature of the artefacts or items they are

associated with. Small size (especially artefacts less than 10mm in maximum size) generally indicates on-site flaking while larger artefacts could have been produced by on-site flaking or carried (transported) around the landscape to different sites (White 2012).

The presence of artefacts indicates that lithic activities were carried out. The activities could have been carried out in the location of a test pit, or perhaps nearby as artefacts could have been displaced, by natural processes or by modern land use, from their original discard location to the location of a test pit.

Lithic activities may be identified in various ways. Rock type is useful because artefacts of different rock types must have originated from different pieces of stone, so have been part of different activities. Some rock types are heterogeneous, such that different pieces of the same rock type have different grain size, inclusions, banding patterns or flaws. Such rock types can potentially be subdivided into separate analytical nodules which may indicate separate lithic activities (Andrefsky 2009:84–85; Larson and Ingbar 1992; White 2012).

Conjoining (refitting artefacts to other artefacts) is useful because it can demonstrate that some artefacts came from the same piece of stone (e.g. flakes conjoined to a core or tool) or that some artefacts could not join due to different size, shape or other attributes. Technical traits or observations may also indicate the nature of activities such as flaking stone in different stages of reduction, different core flaking patterns, or production of distinctive tool forms such as backed artefacts. Artefacts from individual activities can be varied in nature (e.g. technical attributes) and in number or density (Way 2018; White 2012).

6.1.2 Technological Change - Requirement 18

Requirement 18 states that artefact recording should "...identify... significant changes in the technologies used to produce stone artefacts throughout time..." (DECCW 2010:28).

The review here is of excavated sites with artefacts associated with age determinations in the area from Burrill Lake northwards, including Bomaderry and Bass Point in the north, and west to the Clyde River. Information on the assemblages is compiled, together with age determinations, to indicate technological change and when those changes may have occurred (Table 15). Open sites with dates obtained on loose charcoal in sediments are not included as artefacts and charcoal of different ages could have been mixed together by bioturbation (Dean-Jones and Mitchell 1993; Hewitt and Allen 2010; Hughes et al. 2014). Hence sites AG15 at Blue Gum Flat, and PW1 at Tianjara (Boot 1994, 2002) are not included. Shell midden dates are included on the assumption that artefacts within these cultural deposits are likely to be roughly contemporary with the midden. Three shell middens are known to have been excavated but reports on the stone artefact assemblages could not be located in the time available. These include Cemetery Point (Collier 1975),

Bowen Island (Blackwell 1980) and St Georges Basin midden (Barz 1977). Early research on the South Coast identified changes in flaking technology and raw material use and allocated those changes to phases based on the Eastern Regional Sequence. That general chronological framework is followed here although some variations are present between assemblages.

Table 15 Summary of artefact assemblages associated with age determinations.

Phase	Early Pre-Bondaian	Pre-Bondaian	Bondaian	Late Bondaian
Bass Point (Bowdler 1976)	'representative' pre-Bondaian 17,010±650 BP (ANU-536) 22,303-19,136 calBP		Bondaian artefacts 2,975±145 BP (ANU-535) 3,453-2,784 calBP	Post-Bondaian artefacts 570±75 BP (ANU-534) 669-500 calBP
Bobs Cave (Boot 1994, 2002)		Volcanic, quartz, silcrete 5,980±390 BP (ANU-8973) 7,614-5,997 calBP Large artefacts on volcanic pebbles and large silcrete primary flakes 10,850±300 BP (ANU-8313) 13,409-11,935 calBP	Backed artefacts, blade cores 2,250±70 BP (ANU-8427) 1,780±70 BP (ANU-8428) 2,860±100 BP (ANU-100) 2,406-2,006 calBP 1,865-1,531 calBP 3,318-2,763 calBP 1,760±70 BP (ANU-8428) dug into older deposits 1,830-1,517 calBP	Quartz dominant, also silcrete & quartzite, bipolar artefacts 900±60 BP (ANU8979) 923-691 calBP
Bomaderry Creek shelter (Lampert and Steele 1993)			A few backed artefacts, elouera, bipolar artefacts 1,930±60 BP (ANU-1021) 1,992-1,716 calBP	Bipolars, elouera, axes (no backed artefacts) 1,410±60 (ANU-1020) 1,407-1,177 calBP
Bulee Brook 2 (Boot 1994, 2002)	Quartz artefacts 18,810±160 BP (ANU-9375) 23,001-22,415 calBP	Most artefacts of quartz, no large core and scraper artefacts 7,770±80 BP (ANU-9877) 8,923-8,386 calBP 12,040±630 BP (ANU8433B) 16,074-12,768 calBP	Backed artefacts, silcrete predominant, also volcanic 2,250±70 BP (ANU-8427) 3,150±60 BP (ANU-8412) 3,260±170 BP (ANU-8432) 2,406-2,006 calBP 3,481-3,213 calBP 3,966-3,061 calBP	
Burrill Lake (Lampert 1971a)	Serrate retouch, scrapers 20,830±810 BP (ANU138) 26,996-23,332 calBP 20,760±800 BP (ANU-137)	Serrate retouch, scrapers 12,450±160 BP (ANU-336) 15,175-14,075 calBP	Scrapers, thumbnail scrapers, backed artefacts, bipolars Began 5,320±150 BP (ANU-335) 6,400-5,745 calBP, mixed with 1,660±70 (ANU-139) 1,705-1,398 calBP	?

Phase	Early Pre-Bondaian	Pre-Bondaian	Bondaian	Late Bondaian
	26,909-23,254 calBP			
Burrill Lake (Schmidt and Hiscock 2019	Only 50% of silcrete artefacts of pre-heated stone	62% of silcrete artefacts of pre-heated stone	69% of silcrete artefacts of pre-heated stone	76% of silcrete artefacts of pre-heated stone
Burrill Shelter 2 (Boot 1994, 2002)			Few artefacts, little quartz 3,280± 70 BP (ANU8422) 3,689-3,368 calBP	Few artefacts 360±60 BP (ANU-8421) 508-304 calBP
Currarong 1 (Lampert 1971a)			Scrapers, thumbnail scrapers, backed artefacts Before 1,970±80 BP (ANU-243) 2,111-1,715 calBP	Elouera, bipolar artefacts, fish-hook files, edge-ground
Dolphin Point (Kuskie 2005)			Backed artefacts present, not dated	Area 8A no backed artefacts, no bipolars, silcrete predominant but more quartz artefacts & 1 rhyolite core <1,400 cal.BP
Gnatilia Ck 3 GC3 (Boot 1994, 2002)		[Note that pecked circle engravings could be Panaramitee (after McDonald 2008)]		Mostly quartz, bipolar artefacts, artefact from edge-ground implement; silcrete, chert quartzite also present 530±70 BP (ANU-8425) 664-466 calBP; quartz more frequent in deeper spits 1,740±60 BP (ANU-8426) 1,818-1,517 calBP
Kangaroo Hill 4 (Boot 2002)				Quartz c.50%, 1 backed artefact, more quartz deeper c.67% 550±70 BP (ANU-8438) 662-494 calBP
Rock Pool shelter (Boot 1994, 2002)				Mostly quartz but less in upper spits 50-60% 690±70 BP (ANU-8423) 729-545 calBP; more quartz deeper spits 85-90% 1,530±70 BP (ANU-8981) 1,537-1,302 calBP
Sassafras 1 (Flood 1980)			Mostly silcrete. Backed artefacts more common after 3,090±95 BP (ANU-742), also blade core, thumbnail scrapers present at 3,770±150	Few backed artefacts, many small quartz artefacts, bipolar quartz, 2 edge-ground implements

Phase	Early Pre-Bondaian	Pre-Bondaian	Bondaian	Late Bondaian
			BP (ANU-743) 3,483-3,004 calBP 4,571-3,700 calBP	1,695±90 BP (ANU-741) 1,818-1,750 calBP
Sassafras 2 (Flood 1980)			Silcrete backed artefacts	Quartz bipolar artefacts 2,780±115 BP (ANU-744) 3,318-2,761 calBP

Four sites have Pre-Bondaian artefact assemblages, being Bass Point (Bowdler 1976), Bobs Cave, Bulee Brook 2 (Boot 1994, 2002) and Burrill Lake (Lampert 1971a). The assemblage from Burrill Lake includes unifacial cobble cores/tools, horse-hoof cores, serrate retouched and other retouched flakes, some of which are quite large in size (Lampert 1971a:18). The older assemblage (c.27-23.2 cal.ka, pre-Last Glacial Maximum) includes 278 silcrete artefacts, half of which are of heat treated silcrete (Schmidt and Hiscock 2019). A younger assemblage which includes a Deglacial age determination of 15.2-14.1 cal.ka) has a higher proportion of 62% silcrete artefacts of heat treated stone. At Bass Point the early artefacts are said to be "... representative of a Pre-Bondaian industry (following Lampert's terminology: 1971b:127) ..." but are not described in the publication (Bowdler 1976). At Bobs Cave large artefacts on volcanic pebbles and large silcrete primary flakes are dated to the terminal Pleistocene including 13.4-11.9 cal.ka (Boot 1994, 2002). However at Bulee Brook 2 Pre-Bondaian artefacts are mostly of quartz with no large cores and scrapers (Boot 1994, 2002). This assemblage includes age determinations of 23-22.4 cal.ka and 16.1-12.7 cal.ka). The quartz assemblage is notable given the proximity of this site to Bobs Cave (only 1.5km, Boot 1994) where typical Pre-Bondaian artefacts are present, suggesting opportunistic use of quartz without use of other raw material types at Bulee Brook 2.

Bondaian assemblages are present at 10 of the sites. The assemblages are variously said to include backed artefacts, blade cores, thumbnail scrapers, some elouera and some bipolar artefacts (Table 15). There is some indication of change in artefact raw materials. At Bulee Brook 2 artefacts are predominantly of silcrete (Boot 1994, 2002), as is the case at Sassafras 1 and 2 (Flood 1980). At Burrill Lake 69% of silcrete artefacts are of heat treated stone (Schmidt and Hiscock 2019). At Bomaderry Creek a few backed artefacts are of grey silcrete similar to that in the Bendalong-Ulladulla area (Lampert and Steele 1993). The oldest age determination for backed artefacts is 6.4-5.7 cal.ka at Burrill Lake (Lampert 1971). Other age determinations are spread from 4 cal.ka at Bulee Brook 2 to 1.5 cal.ka at Bobs Cave (Table 15).

Eight sites show technological change from the Bondaian to Late Bondaian or Post-Bondaian, and another three sites have only Late Bondaian assemblages. The most commonly reported change from the main Bondaian phase is increased use of quartz and increased bipolar artefacts, probably from bipolar flaking of pebbles. Some sites also include elouera or use polished artefacts and edge-ground implements (hatchets/axes). At Gnatilia 3 and Rock Pool Shelter there is a minor late

decrease in the use of quartz (Boot 1994, 2002). The Late Bondaian assemblages date from 1.8-1.7 cal.ka at Sassafras 1 (Flood 1980) and 1.8-1.5 cal.ka at Gnatilia Ck 3 (Boot 1994, 2002). Sassafras 2 has a much older age determination for a quartz bipolar assemblage at 3.3-2.7 cal.ka (Flood 1980), but given the consistency of the other age determinations for bipolar quartz assemblages there may have been a problem with the Sassafras 2 age determination. At Dolphin Point Area 8A silcrete is predominant and bipolar artefacts were not recovered, but quartz artefacts are more frequent than in an earlier assemblage (Kuskie 2005).

6.2 Analysis

Forty-two (42) artefacts were recovered from the test excavation – 32 from the initial 50x50cm test pits and another 10 from test pit expansions (Table 16). The initial 50x50cm test pits indicated that most artefacts occur along the top of the spur, with several empty test pits around the south-east and north-east sides of the tested area having no artefacts (Figure 17). The highest artefact count occurs in test pit 1 (TP1), but that count is exaggerated because nine pieces are small broken fragments with remnant flaked surfaces, which probably derive from a single broken artefact.

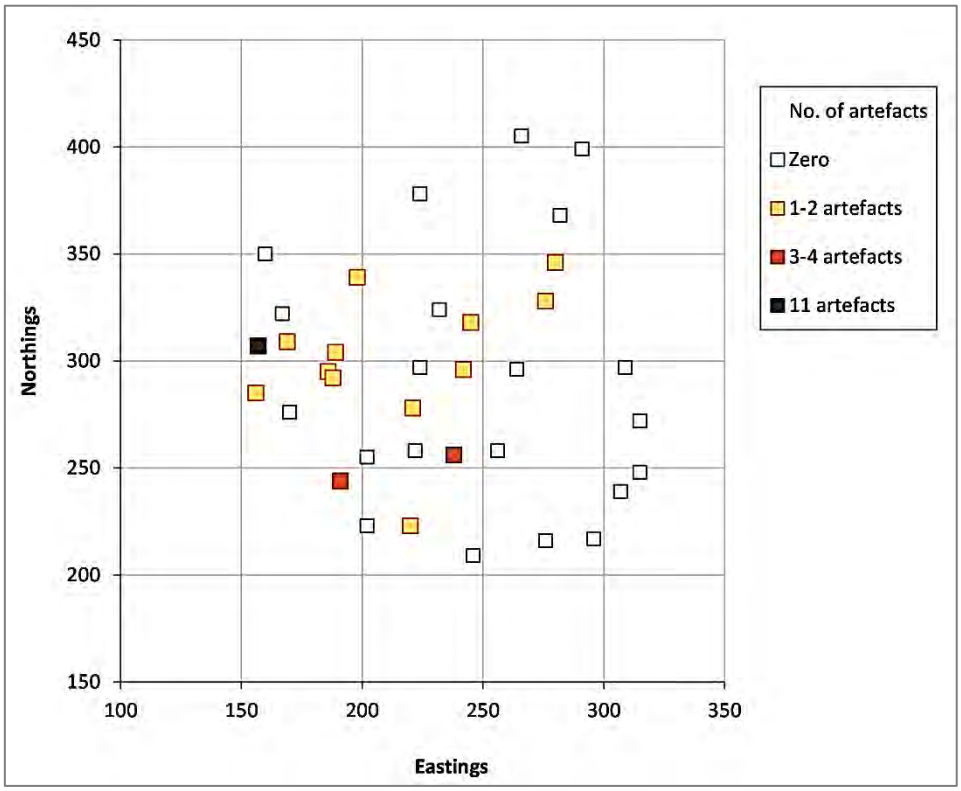


Figure 17: Artefact distribution in 50x50cm test pits.

The vertical distribution of artefacts are tabulated, together with the base of excavated deposit (Table 17). Most artefacts occur above the base of excavation, except TP1, TP4, TP10 and TP13. In TP1 artefact counts appear to increase with depth but most of these are the small broken artefact fragments. As most artefacts occur above the base of the deposit they could have been vulnerable to land disturbance

which affects the upper or middle parts of formerly undisturbed deposit (e.g. modern land disturbance, erosion).

Table 16: Artefacts types.

Test Pit	Location	Usewear	Retouched broken	Backed broken	Core	Core broken	Platform artefact	FF/FP artefact	Artefact fragment	Total
1	157E 307N							2	9	**11**
1B	157E 307N							1	1	**2**
1D	157E 307N			1				1		**2**
4	188E 292N				1	1				**2**
5	169E 309N							1		**1**
6	189E 304N						1			**1**
7	280E 346N					1				**1**
8	242E 296N	1								**1**
9	276E 328N							1		**1**
10	245E 318N						1			**1**
11	221E 278N							1		**1**
13	238E 256N						4			**4**
13B	238E 256N						2	1		**3**
17	198E 339N					1				**1**
22	156E 285N					1				**1**
22C	156E 285N						1			**1**
25	191E 244N		1				2			**3**
25B	191E 244N							1		**1**
25C	191E 244N							1		**1**
27	220E 223N						2			**2**
32	186E 295N							1		**1**
	Total	**1**	**1**	**1**	**1**	**4**	**13**	**11**	**10**	**42**

Table 17: Depth of artefacts.

Depth (mm)	TP1	TP 4	TP 5	TP 6	TP 7	TP 8	TP 9	TP 10	TP 11	TP 13	TP 17	TP 22	TP 25	TP 27	TP 32	Total
0-5	1		1	1	1	1	1	1	1	5	1	1	2		1	**18**
5-10	1									2			3	1		**7**
10-15	5	2										1		1		**9**
15-20	8															**8**
20-25																
Total	**15**	**2**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**7**	**1**	**2**	**5**	**2**	**1**	**42**

Note to Table 3: Grey shading indicates unexcavated deposit; top of grey shading approximates the base of excavation.

All the artefacts are of silcrete, and silcrete occurs naturally on the site (Leigh Bate, personal communication, photographic evidence). The natural silcrete is probably part of a substantial silcrete formation which occurs naturally at Bannisters Point, near Buckleys Point, Cunjurong Point, Red Head and Washerwomans Beach at Bendalong (Hughes et al. 1973). Most silcrete artefacts in the current study are pale grey, some with cream, brown or pink, and a few dark red (Plate 43 to Plate 46). Most have fairly smooth glossy surfaces indicating that at least some of the stone had been heated before flaking (Corkill 1997; Domanski and Webb 1992; Hiscock 1993; Mercieca and Hiscock 2008; Rowney 1994; Rowney and White 1997). A few artefacts have inclusions of different colours and/or textures (Plate 46), and artefact #9 (Plate 45) is more varied with irregular bands and mottles of different colours.

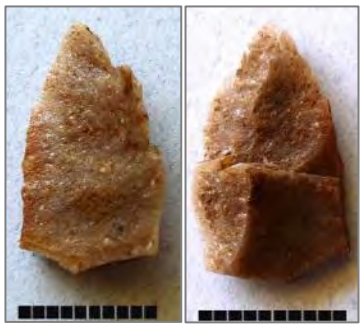


Plate 43: Medial piece of broken artefact #12 from TP1/D spit 3.
Ventral and dorsal surfaces.

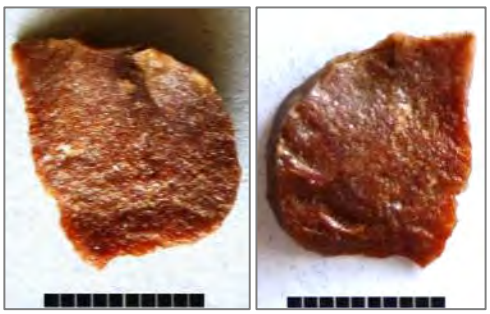


Plate 44: Flake #37 from TP13/BD spit 2.
Ventral and dorsal surfaces.

Plate 45: Distal piece of broken artefact #9 from TP1/D spit 3.
Ventral surfaces.

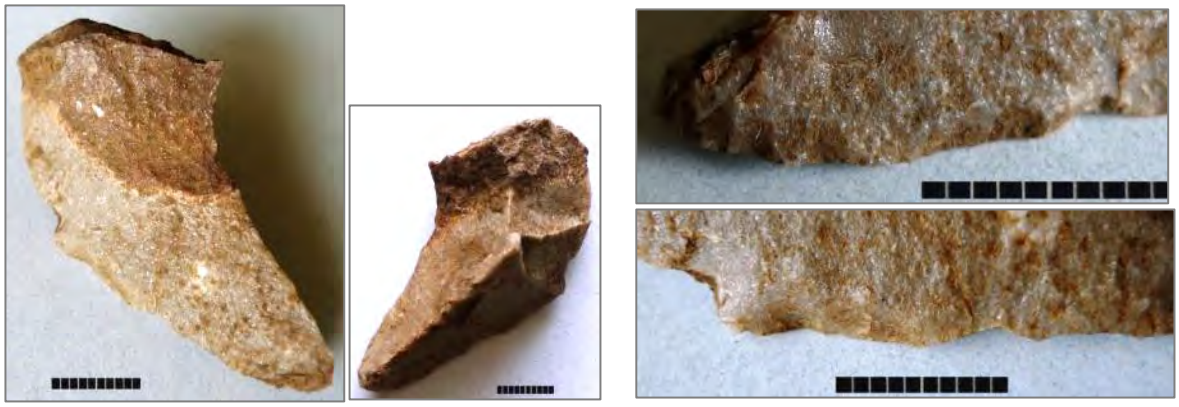


Plate 46: Flake with probable usewear #26 from TP8 spit 1.

Ventral and dorsal surfaces and detail of scarred edge.

The test excavation recovered 24 pieces of silcrete which are not flaked artefacts. These are variously angular broken pieces (e.g. Plate 47) and blocky pieces with rounded margins. Most are pale grey with a few having cream, brown or pink colours in addition to grey. Some pieces retain thin outer weathered surfaces indicating that the stone occurs naturally as weathered blocks, subsequently broken. Four artefacts also retain surfaces which are variously weathered, rounded or cortical suggesting that people may have flaked locally available stone.

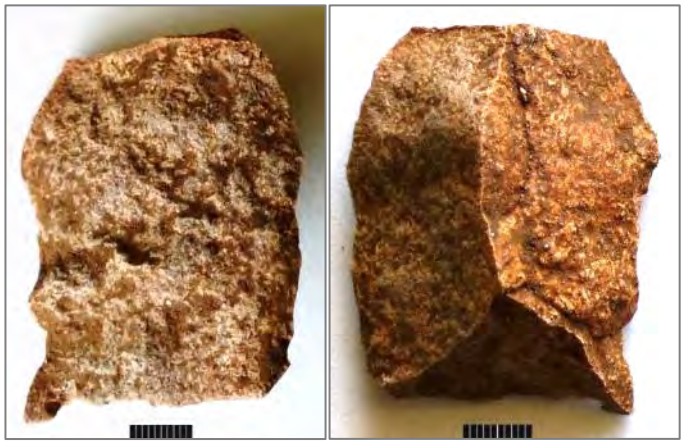


Plate 47: Angular piece which is not an artefact #4 from TP1 spit 4.

Note rough crenated surface in left image and partial thin weathered surface on right image (right side of piece). Scale 10mm long.

The artefact assemblage includes several artefacts which provided information on the nature of stone reduction. These are described in some detail.

The largest core is broken (from TP22, Plate 48). The broken core measures 95mm in maximum size and weighs 300g so the original flake must have been very large. The broken core lacks cortex indicating that the original flake was struck from a bedrock outcrop or a boulder which had already been flaked. The flaked surfaces are relatively rough, indicating that the fracture path had travelled around the silcrete grains. This probably indicates that the stone was not heated before flaking. The flaked surfaces are pale grey but appear to be stained brown, possibly because of the rough nature of the surfaces. Smaller flakes have been struck from the margins of the artefact. Most flakes were removed by unifacial flaking from the ventral surface of the former flake, but a single scar is present on the ventral surface

suggesting an attempt at bifacial flaking. Negative scars indicate that detached flakes were small to medium sized (up to 43+mm) and variously long to wide in shape. A similar artefact occurs in an early Pre-Bondaian assemblage at Burrill Lake and was classified as a 'scraper' (implement #13 depicted by Lampert 1971:18) but a larger number of artefacts, ideally with chronological information, would be needed before it could be concluded that artefact #48 is of similar age.

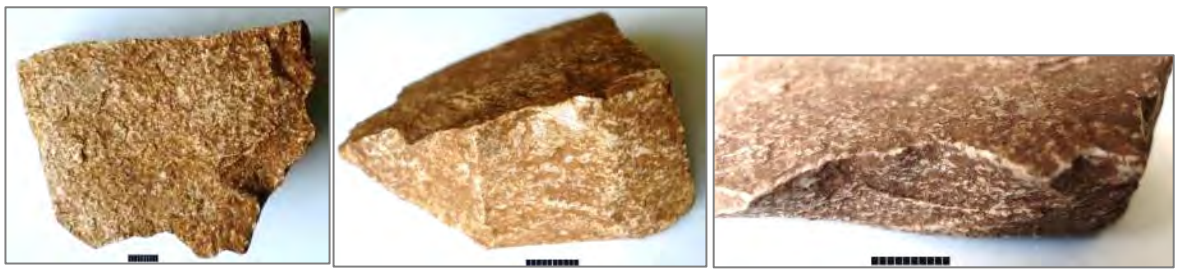


Plate 48: Broken core with flake body #48 from TP22 spit 3.

Ventral surface with single negative scar, negative scars along margins.

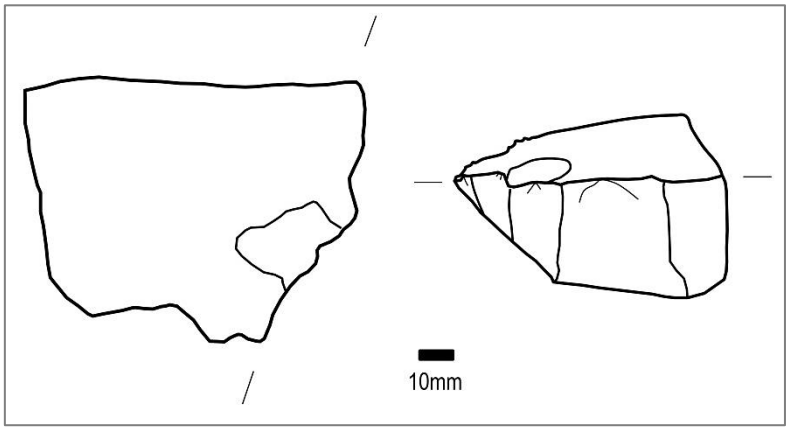


Figure 18: Core #48.

Two other core fragments also show unifacial flaking (artefacts #25 and #43).

Core 18 shows a different approach to stone reduction (Plate 49). This artefact is typical of the 'retouched' flakes of the Redbank A Strategy, which is associated with backed artefact production (Hiscock 1993). The silcrete is a pale grey-pink and glossy with fairly smooth surfaces except for a rougher section on the left dorsal face. It had probably been struck from a heat treated core. Artefact #18 is broken so would have measured more than 50mm in size. The left lateral margin has been prepared by removing small scars from its surface (Plate 49 right image) then long flakes were removed from the ventral surface (Plate 49 left image). This technique is referred to as asymmetric flaking (Appendix I). The two scars are 20mm and 24mm long; such flakes possibly sought for shaping to make backed artefacts (e.g. Plate 50, Figure 20), although specific evidence of backing is not present amongst the artefacts from TP4.

Plate 49: Broken core with flake body #18 from TP4 spit 3.

Ventral surface with negative scars, dorsal surface of flake body, and detail of asymmetric scarring on platform surface.

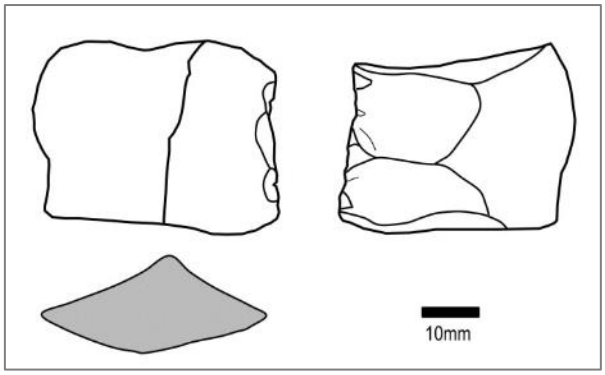


Figure 19: Core #18.

Core #19 is smaller, at 38mm in size and weighing only 12g (Plate 51). It is of red, highly glossy, heat treated silcrete. It retains a section of dull orange-brown weathered surface, and rougher remnant flaked surfaces. The artefact used as the core was struck from a weathered block of silcrete, then the artefact was heated, then it was used as a core leaving highly glossy smooth scars. A flake was struck from a unifacial platform (Plate 51 left image), then the core was rotated. The distal end of the core has a series of small scars indicating that flakes were struck from the long axis. The core was then rotated 180o, a platform prepared and at least two flakes were struck from the long axis in the opposite direction (asymmetric flaking, Plate 51 right image).

At this time, it is not known how the different knapping strategies relate to each other. There may have been two different generalised reduction sequences (GRS) with large cores like #48 from one GRS, and smaller cores like #18 and #19 from another GRS which includes heat treatment and may (at least sometimes) include backed artefact production. Or alternatively the cores may have been part of a single GRS (Flenniken and White 1985) with heat treatment of suitable objects carried out as convenient, or pieces which had been heated accidentally in fires may have been used opportunistically.

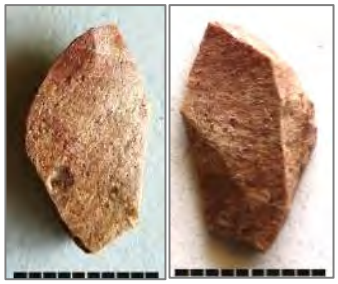


Plate 50: Broken backed artefact #11 from TP1/D spit 1.

Ventral and dorsal surfaces.

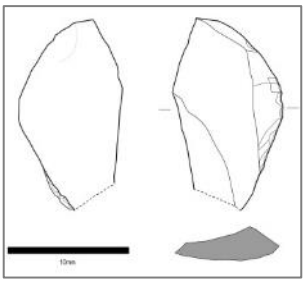


Figure 20: Broken backed artefact #11 from TP1/D spit 1.

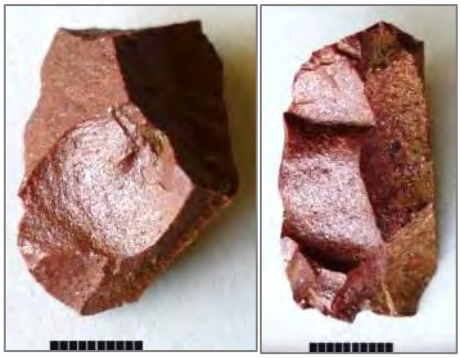


Plate 51: Core with indeterminate body #19 from TP4 spit 3.

Negative scars from flakes removed from long axis of core, shorter negative scar from second platform.

6.3 Comparison with other assemblages and discussion

Comparative analysis has been restricted by limited access to other reports – reports either not in AHIMS, not identified using standard search criteria, or not posted to the internet.

Manyana sites 1 to 6 and site 58-2-241 – Kuskie 1997, ERM 2004

Archaeological survey in 1997 recorded 195 artefacts within and beyond the area of the current test excavation (Manyana site 1, AHIMS site 58-2-337, Kuskie 1997). Unfortunately the full list of recorded artefacts is missing from the site recording form and the report is not held in AHIMS. The available site form indicates that most artefacts are of silcrete (96%) with a few of quartz and chert and one of chalcedony. Data for four silcrete cores indicates they are less than 50mm in size, and variously have one to three platforms. Some have blade scars. One has terrestrial cortex. A quartz core has pebble cortex and two platforms; it was not recorded as being bipolar suggesting that it was reduced by freehand flaking.

Manyana sites 2 to 5 (58-2-338, -339) are located beyond the current study area. They comprise surface artefacts of grey and red silcrete. Notable are a grey silcrete bipolar core at Manyana site 2 (58-2-338) and a blade core at Manyana site 4 (58-2-340).

The sites were revisited by ERM (2004) who relocated three of the sites and another site was recorded. In addition to the above artefacts they reported a piece of a grinding stone at Manyana site 1 and a backed artefact. Site 58-2-241 is a midden with artefacts, of silcrete, quartz, quartzite and porphyry, including cores, blade cores and a quartz bipolar core. New site Manyana 6 consists of two silcrete flakes and a hammerstone (ERM 2004) – the first reported for this area.

The available information suggests that artefacts from the current testing are broadly similar to surface artefacts at Manyana site 1 and at nearby sites. The latter have reported three artefact types which were not found in the current test

excavation, being a hammerstone, a broken grindstone and a quartz bipolar core. This could be related to sample size, as larger assemblages are expected to be more diverse than smaller assemblages (Leonard and Jones 1989); only 42 artefacts having been recovered from the current testing.

MANYANA LOTS 682, 705 AND 810 – NAVIN OFFICER 2005, 2008

Archaeological survey and test excavation was carried out in an area of land less than 1km south of the current study area (Navin Officer 2005, 2008). The survey recorded 35 artefacts. Most artefacts are of silcrete (n=27) but also present are five of quartzite, two of quartz and one of a volcanic stone. Some of the artefacts are relatively large, measuring more than 50mm and some retain cortex. They include a silcrete core with "attempted blades", and evidence that some cores had been flaked through their short axis, e.g. short dimension of a tabular core and a core with thick flake body; probably like artefact #48 of the current study. Generally the artefacts recorded by Navin Officer (2005) are broadly similar to artefacts from the current study, except for the presence of raw material types other than silcrete. Navin Officer (2005) also recorded a 'mottled' silcrete artefact, which may be of the same stone as artefact #39 (Plate 45) from the current excavation.

A test excavation was subsequently carried out (Navin Officer 2008) although unfortunately the appendices containing artefact details are missing from the AHIMS version. A total of 27 test pits were excavated by machine and samples of the excavated soils were sieved. A total of 479 lithics (plus 17 heat fractured pieces) were recovered from 21 of the test pits. The report states that 126 lithics are artefacts (Navin Officer 2008:17). Elsewhere all 479 lithics are classified as flaked artefacts (Navin Officer 2008:20) although on page 21 the authors note "The lithic fragments are not considered definitive artefacts and have been removed from the following analyses. This leaves a total of 126 artefacts ..." (Navin Officer 2008:21).

The reported data indicates that some modified artefacts are present, including cores, backed artefacts and other retouched artefacts (a total of 22 artefacts). A total of 104 complete flakes are also reported. These categories sum to 126 so perhaps this is the artefact count referred to on pages 17 and 21 of the report. A total of 126 artefacts would give an average density of 4.7 artefacts/test pit.

One complete bidirectional core has blade scars. This has numerous step terminations which would have hindered further flaking. Three core fragments are also present, one of which has remnant overhang removal (Navin Officer 2008:26).

Two retouched flakes have burin spalls (Navin Officer 2008:23). A photo of one of these artefacts indicates it is a core with former flake body, with smaller flakes removed from a lateral margin. it was probably used to produce flakes for backed artefact production (Hiscock 1993). It is a variation of the pattern of core reduction shown by artefact #18 of the current study (Plate 49).

Four other retouched flakes include an end scraper and a notched tool. Two complete and six broken backed artefacts are present, some having been made on wide or irregular flakes.

In these respects the assemblages recorded and/or recovered from this area of land by Navin Officer (2005, 2008) are similar to the assemblage recovered by the current test excavation.

MANYANA LOTS 172 AND 823 – KUSKIE 2006

Thirteen surface artefacts were recorded by Kuskie and Clarke (2006) less than 1km south-west of the current study area. Most of the artefacts are of grey silcrete and less than 40mm in size. Also present are a rhyolite and a chert artefact. Of note is a large (60-70mm) multiplatform core; a large core also being found within the current testing.

6.4 ACTIVITIES - REQUIREMENT 18

Only limited information on the nature of activities can be discerned from the current assemblage.

Most of the silcrete is homogenous, making it difficult to identify different analytical nodules (see section 6.1.1, Andrefsky 2009; Larson and Ingbar 1992; White 2012). A few artefacts show sharp variation with inclusions or mottling (Plate 45, Plate 46). This means that an artefact may have been part of the same flaking activity as another artefact which appears to be of different stone.

One artefact appears to have usewear (#26 Plate 46). This artefact may have been used in an activity on the site, or given the size of the artefact (58mm) it could have been made and used elsewhere and carried to the site.

Cores are present but it is not known whether or not they were flaked on the site. No conjoining artefacts are identified but they could have been present but not intercepted by the test pits or they could have been dispersed by modern land disturbance.

A backed artefact is present (#11 Plate 50) but it is not known whether this artefact was made on the site or made elsewhere and carried to this location.

6.5 TECHNOLOGICAL CHANGE - REQUIREMENT 18

Most artefacts from the current study have smooth glossy surfaces suggesting that much of the silcrete had been heated before being flaked. Flaking of silcrete which had been heated was common during the last few thousand years (Schmidt and Hiscock 2019) so most of the artefacts may be only a few thousand years old at most.

The assemblage includes a backed artefact (Plate 50) and a core typical of backed artefact production (Plate 49). Backed artefacts are most frequent between c.4 cal.ka and 1.5 cal.ka (Table 15) suggesting that some of the artefacts in the current study area were made during that period. No bipolar artefacts are present in the current assemblage, suggesting that artefacts may not date to the Late/post Bondaian phase. However, a larger sample size would be necessary to be confident of this. Additionally, the Dolphin Point site Area 8A also has predominantly silcrete artefacts and no bipolar artefacts but shell midden indicates a Late Bondaian age.

The current study also includes a large retouched broken flake of silcrete (#48 Plate 48) which has not been heat treated, and which had been flaked through its short axis. Similar artefacts are recorded at Manyana just south of the current study area (Navin Officer 2005) and at Burrill Lake in Pre-Bondaian assemblages (Lampert 1971). It is possible, but not certain, that artefact #48 is Pre-Bondaian in age.

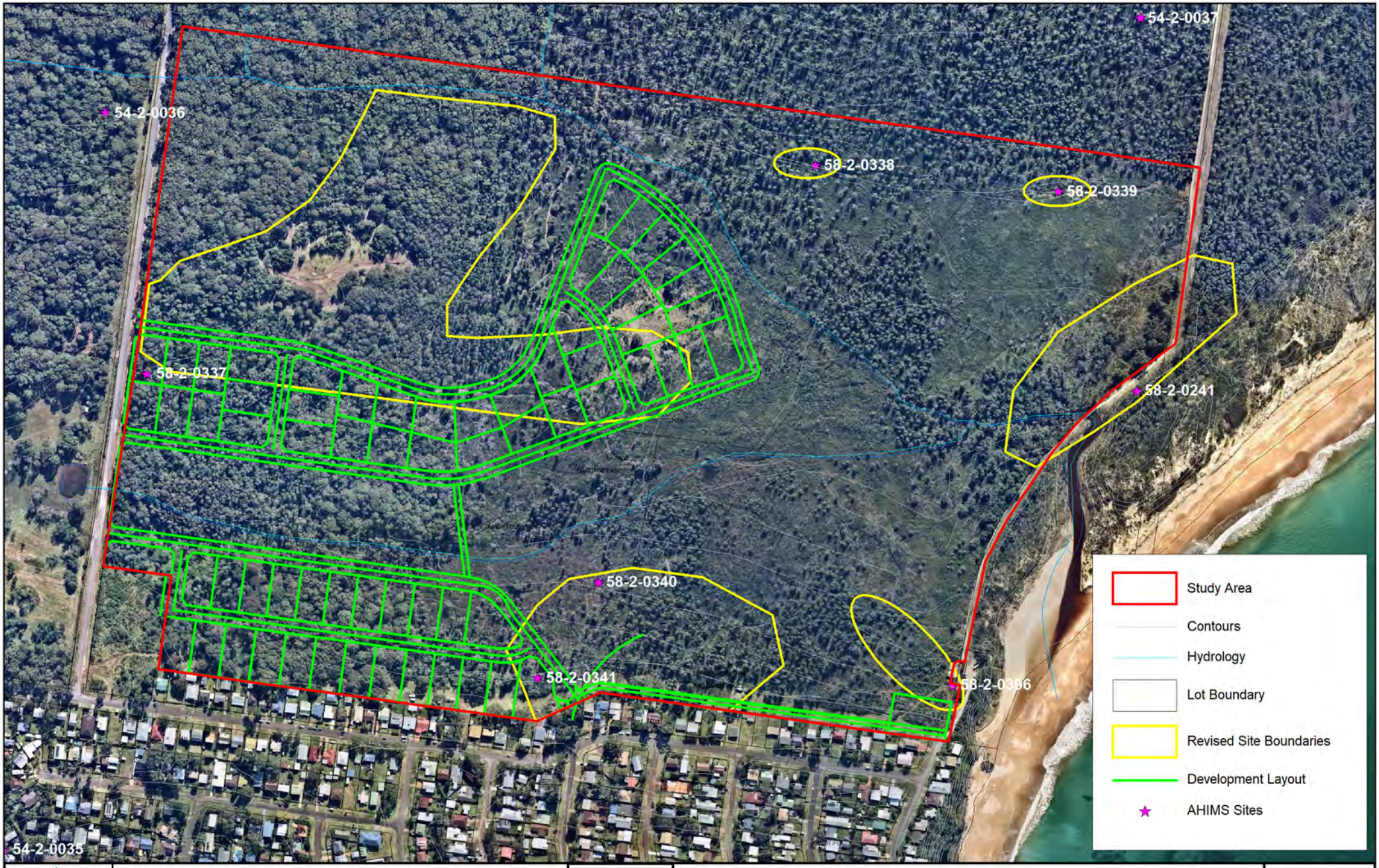
A larger number of artefacts, which demonstrate various generalised reduction sequences (GRS) would be helpful to understand the different approaches to stone reduction in this locality, given that silcrete occurs naturally.

6.6 Summary

While the area was noted to be heavily disturbed, the site does contain a relatively large assemblage across the area of Manyana 1 in a disturbed context. None of the artefacts are likely to be in their original depositional context and thus analysis of the spatial distribution of items is unlikely to provide further information regarding the original Aboriginal occupation of the area. However, the assemblage is able to provide some limited information regarding activities undertaken within an area.

The exact extent of the deposits is very difficult to define due to the heavy vegetation cover present across much of the site, including around likely boundary areas. However, the nature of the archaeological site is considered to comprise a surface artefact concentration. Although artefacts were recovered from the subsurface test excavations, this is likely due to disturbance and taphonomic processes churning the soil, rather than accumulation of material within the area. Overall, Manyana 1 is considered to comprise a low- to moderate density silcrete artefact concentration focussed on the spur crest running east-west through the western portion of the study area.

Based on the results of the assessment and test excavations, site boundaries have been refined and are shown in Figure 21. Where sites were not visible during the current assessment, their originally defined boundaries have been retained.



PO Box 236
NOWRA
NEW SOUTH WALES 2541

0 225 450
metres

Projection:
MGA Zone 56 (GDA 94)
Base Map:
NearMaps 2022
Image Date: 07/05/2022
Final - Version 1

Figure 21: Revised site boundaries.

N

7.0 Aboriginal Cultural Heritage Significance Assessment

7.1 Introduction

The *Aboriginal cultural heritage consultation requirements for proponents 2010* acknowledge that:

- Aboriginal people have the right to maintain their culture, language, knowledge and identity
- Aboriginal people have the right to directly participate in matters that may affect their heritage
- Aboriginal people are the primary determinants of the cultural significance of their heritage

Undertaking consultation with Aboriginal people ensures that potential harm to Aboriginal objects and places from proposed developments is identified and mitigation measures developed early in the planning process.

7.2 Criteria

The Burra Charter is considered an appropriate framework for the assessment of cultural heritage, which can be made based on the following assessment criteria:

- **Social value:** Also referred to as cultural value, this criterion considers the spiritual, traditional, historical or contemporary associations an area or place has for Aboriginal people
- **Historic value:** the relationship between a place and people, events, phases or activities of importance to the Aboriginal community
- **Scientific value:** assessment under this criterion considered the ability of a landscape, place, area or object to inform scientific research and/or analysis and to assist in answering research questions
- **Aesthetic value:** the ability of a place, area, landscape or object to demonstrate aesthetic characteristics, or possess creative or technical values
- **Representativeness:** this criterion examines if the item is a representative example of that site type, and if it possesses the main characteristics of that site type
- **Rarity:** assesses whether the site is uncommon or endangered within a region and to what extent that site type is found elsewhere

Additionally, archaeological significance is assessed based on the archaeological or scientific values of an area. These values can be defined as the importance of the area relating to several criteria. Criteria used for determining the archaeological significance of an area are as follows:

- **Research potential:** Can the site contribute to an understanding of the area/region and/or the state's natural and cultural history? Is the site able to provide information that no other site or resource is able to do?

- **Representativeness:** is the site representative of this type of site? Is there variability both inside and outside the study area? Are similar site types conserved?
- **Rarity:** is the subject area a rare site type? Does it contain rare archaeological material or demonstrate cultural activities that no other site can demonstrate? Is this type of site in danger of being lost?
- **Integrity/Intactness:** Has the site been subject to significant disturbance? Is the site likely to contain deposits which may possess intact stratigraphy?

Further, an assessment of the grade of significance is made, based on how well the item fulfils the assessment criteria. The Heritage Branch of the Department of Planning (now the Heritage Division of the Department of Planning, Industry and Environment) 2009 guideline *Assessing Significance for Historical Archaeological Sites and 'Relics'* defines the grading of significance as follows:

Table 18: Grading of significance, from Heritage Branch 2009

Grading	Justification
Exceptional	Rare or outstanding item of local or State significance. High degree of intactness. Item can be interpreted relatively easily.
High	High degree of original fabric. Demonstrates a key element of the item's significance. Alterations do not detract from significance.
Moderate	Altered or modified elements. Elements with little heritage value but which contribute to the overall significance of the item.
Little	Alterations detract from significance. Difficult to interpret.
Intrusive	Damaging to the item's heritage significance.

Whilst this was developed for the assessment of significance of historical items, the criteria are applicable to Aboriginal significance assessments as well. It is important to note that the below assessment is specific to Aboriginal cultural heritage and does not consider the non-Aboriginal significance of the site.

7.3 Significance Assessment

Social value

The Aboriginal community are best placed to make a determination of the social or cultural value of the study area. No specific comments regarding the social value of the area to Aboriginal people have been received from the RAPs to date. It is important to note that many landscapes are considered part of a cultural landscape and therefore hold social and cultural significance to Aboriginal people.

Historic value

The site possesses Aboriginal cultural material on the ground surface and intermixed within the deposit. There is potential for further low density subsurface archaeological deposits to be present, although these would be likely to be disturbed. Therefore, the site is considered to have low historical value with regards

to Aboriginal heritage due to the highly disturbed and dispersed nature of the archaeological deposit.

Scientific value

The study area is considered to have low scientific value. The site possesses Aboriginal cultural material on the ground surface; however, this is in a highly disturbed context. Therefore, the site is considered to have low scientific value.

Aesthetic value

Generally, aesthetic value is determined by the response evoked by a setting. The study area is not considered to hold aesthetic significance with regards to Aboriginal heritage, based on its disturbed context.

Representativeness

The site is considered to be representative of a low-density artefact scatter in a disturbed context within the Shoalhaven City Council area.

Rarity

The site is not considered to have value under this criterion as it is not a particularly rare site type within the locality.

Research Potential

The study area is moderately disturbed and is not considered to possess research potential. The low density artefact assemblage recovered during the test excavations is too small to yield statistically significant information.

Integrity/Intactness

The site is considered to be disturbed to some extent across the entirety of the study area, and therefore is not considered to have integrity, nor be intact.

7.4 Cultural Significance Assessment

Generally, all Aboriginal sites are of high significance and importance to the Aboriginal community, both locally and more broadly. The Aboriginal social or cultural value of the study area can only be determined by the Aboriginal community and to date, no comments have been received regarding the specific social significance of the study area.

It is acknowledged that the overall significance of a site is determined by both the cultural and scientific values of the area; with cultural values potentially extending beyond a specific study area and incorporating cultural landscapes in many cases. The cultural significance of an area can only be determined by the Traditional Owners of that area.

7.5 Statement of Archaeological Significance

A number of artefact concentrations are registered within the overall study area on Inyadda Drive, Manyana. The archaeological test excavation undertaken within the

study area identified a low density subsurface archaeological deposit in a disturbed context. The assemblage is considered limited in its ability to provide information about the nature of activities undertaken by Aboriginal people within the area. The site is considered to be of low archaeological significance; however this does not necessarily mean it is of low cultural significance.

8.0 Impact Assessment

8.1 Proposed Development

It is proposed to subdivide the subject land to create a biodiversity conservation lot, along with residential dwellings. The proposal includes:

- Lot 1 – 57.53ha Community title lot for biodiversity protection purposes;
- Lots 2-66 Torrents title residential lots ranging in size form 2000m^2 to 2840m^2;
- Lot 67 – Proposed public reserve for a local park (2088m^2) containing grave site to be dedicated to Council;
- Lot 68 – Proposed RE1 Open Space Lot (3054m^2) to be acquired by Council;
- Creation of a timber pedestrian accessway over Lot 1;
- Creation of a 6m wide fire trail including a beach access trail;
- Creation of a 6m wide drainage easement;
- Construction of an 8m wide pavement for emergency purposes with restricted access to Curvers Drive;
- Road Construction and dedication including intersection treatments to existing public roads;
- Indicative Building Envelope Plans in order to protect hollow-bearing trees where possible;
- Asset Protection Zones;
- Tree removal within the development footprint;
- Bulk earthworks to facilitate building platforms;
- Culvert upgrades on Inyadda Drive for flood free access;
- Retaining walls around perimeter road;
- Stormwater and Water Quality works including swales in the road reserve;
- Street tree planting; and
- Proposed sewer servicing scheme including pump out system.

A Community Plan of Management (PoM) will be developed subsequent to the issue of the DA to guide the management of the community title lot, and this is anticipated to be a condition of consent prior to the commencement of construction. This will guide the management of the community lot, including protection of heritage sites located within the community lot (Figure 22). Wording for the protection of Aboriginal sites within the community title lot is attached as Appendix L of this report.

8.2 Potential Impact

Several artefact concentrations have been identified within the study area, with the main areas associated with a site known as Manyana 1 (AHIMS #58-2-0337) and Manyana 5 (AHIMS #58-2-0341). The proposed development of the site has the potential to impact on these artefact concentrations and any subsurface deposits which may be present within the area. This would occur during any earthworks on the site for subdivision works, such as leveling of the site, trenching for services,

construction of roads and other access for the site. Depending on the nature of the works proposed, the entirety of the site could potentially be impacted.

The proposed fire trail along the southern boundary of the site could also impact on previously registered sites.

8.3 Assessment of Impact

Sites 58-2-0340 and 58-2-0341 are likely an extension of the same site, and it is possible that the road connection to Curvers Drive in the central southern portion of the study area will impact a small portion of 58-2-0340 and 58-2-0341. Additionally, a 6m wide fire trail is required along the southern boundary, behind existing dwellings. This formalisation of the existing informal vehicle trail along this boundary would partially impact on 58-2-0341; however the site is considered to extend further than the area to be impacted. The remainder of both sites would be retained in situ.

58-2-0396 has been subject to surface collection and test excavation in the past (NOHC 2006), with three non-artefactual lithics recovered from test excavations and no items able to be collected. However, the site is still considered valid. There is a small green space proposed in the far south eastern corner of the study area which would likely impact a small portion of this site as part of the development.

The proposed development would impact a portion of site 58-2-0337, which is located within the proposed subdivision area of the site. However, this site is highly disturbed by previous land use practices and it is proposed to collect the artefactual material present on the ground surface of the development envelope prior to impact. This material is all in a secondary depositional context and as such, the proposed development is unlikely to result in total loss of value in this area, particularly as the lithic items would be retained on site and there are portions of the site which would not be impacted by the proposal.

8.4 Ecologically Sustainable Development (ESD)

It is a requirement of Section 2A(2) of the NPW Act to apply the principles of Ecologically Sustainable Development (ESD) when considering any impact to Aboriginal objects and places. ESD integrates economic and environmental considerations, which includes cultural heritage, into decision-making processes. In general, ESD can be achieved through consideration and implementation of two key principles, being intergenerational equity and the precautionary principle.

Intergenerational equity refers to the present generation having consideration for the health, diversity and productivity of the environment for those generations to come. In terms of Aboriginal cultural heritage, this relates to cumulative impacts to Aboriginal objects and places within a region. Intergenerational equity therefore relies on the understanding that a reduction in the number of Aboriginal objects and places within a region results in fewer opportunities for Aboriginal people to access their cultural heritage in the future. Thus, it is essential to understand what comprises

the Aboriginal heritage resource, both known and potential, when assessing intergenerational equity within a region.

The precautionary principle relates to threats of serious or irreversible environmental damage, and that lack of scientific certainty regarding the degree of potential damage should not be a reason to postpone adequate reasonable measures to prevent harm to the environment. Regarding Aboriginal cultural heritage, the precautionary principle relates to where a proposed development may seriously or irreversibly impact Aboriginal objects or places, or their significance; and where there may be uncertainty relating to the integrity, rarity or representativeness of Aboriginal cultural values.

The Code of Practice outlines that a precautionary approach should be taken to avoid or reduce damage to Aboriginal objects or places, with cost-effective measures implemented wherever possible. Additionally, a cumulative impact assessment should be completed to determine how the proposed development would impact the cultural resource in the wider region.

8.4.1 Intergenerational Equity

The site types within the study area are common in the region and destruction of highly disturbed, dispersed sites with no archaeological integrity would not impact on the knowledge of the past use of the area. The disturbed nature of the sites means they are unlikely to have significant value as teaching aids and thus do not warrant conservation on those grounds. Overall, it is considered that the impact of the destruction of these sites would be negligible with regards to the ongoing transmission of cultural knowledge to future generations, although it is acknowledged that destruction should be avoided where possible.

8.4.1 Cumulative Impacts

The cumulative impact of the project on the Aboriginal cultural resource must be considered as part of an assessment, and managed appropriately and sensitively. Avoidance of impact is the best practice approach wherever possible, particularly for sites that are intact, contain high numbers of artefacts, or are considered significant to the community.

In terms of cumulative impact, the site contains evidence of Aboriginal occupation. While the proposed works are located in the same area as the surface artefacts, these objects are not in their primary depositional context and are unlikely to provide research potential in their current locations. As such, it is considered that the cumulative impact of the proposed project on Aboriginal cultural heritage would be minimal, assuming appropriate mitigation measures are implemented prior to the commencement of works.

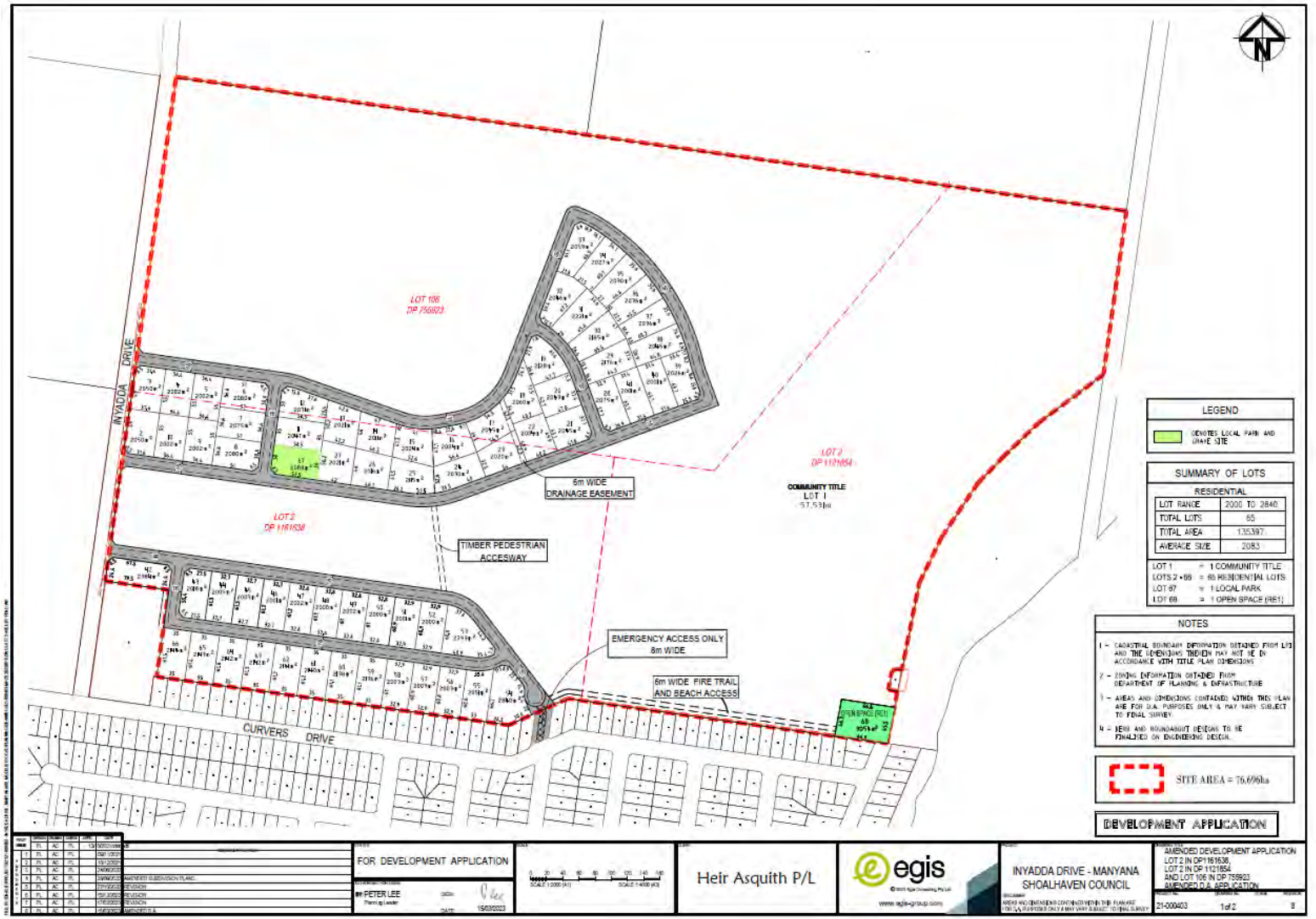


Figure 22: Proposed development within study area (Source: Heir Asquith 2021)

It is considered that collection of surface artefacts and relocation to an area where they would not be disturbed would reduce the overall impact of the project on the archaeological resource. Additionally, a large portion of the study area is proposed to be retained for biodiversity conservation, which allows any archaeological deposits within this area to be retained in situ. As such, this assists in reducing the overall impact of the proposal on Aboriginal cultural heritage within the area.

Mitigation measures have been proposed in Section 9.0.

9.0 Management, Mitigation and Recommendations

9.1 Guiding Principles

Wherever possible and practicable, it is preferred to avoid impact to Aboriginal archaeological sites. In situations where conservation is not possible or practicable, mitigation measures must be implemented.

The Burra Charter: The Australia ICOMOS Charter for Places of Cultural Significance, 2013 (The Burra Charter) provides guidance for the management of culturally sensitive places. The Burra Charter is predominantly focussed on places of built heritage significance, but the principles are applicable to other places of significance as well.

The first guiding principle for management of culturally significant sites states that "places of cultural significance should be conserved" (Article 2.1). A cautious approach should be adopted, whereby only "as much as necessary but as little as possible" (Article 3.1) should be changed or impacted.

Mitigation measures depend on the significance assessment for the site. Cultural significance of sites should also be considered in consultation with the Aboriginal community during community consultation.

9.2 Harm Avoidance or Mitigation

The study area contains six registered Aboriginal sites and associated low density subsurface material in some areas, along with a seventh site which is registered outside the study area but extends into its boundaries. There are a number of sites located outside of the proposed development area. The entire study area has been disturbed through wholesale clearing of the three lots, including removal of stumps and roots, leading to significant soil disturbance. However, preventing further harm to Aboriginal cultural material must be considered as part of the assessment.

There is increasing demand for additional residential land in coastal areas such as Manyana. Manyana is identified in the Illawarra Shoalhaven Regional Plan as one of several established and smaller areas that will add to diversity of housing supply. The proposed development has been designed to address this requirement.

A number of options for managing the cultural heritage resource within the study area were considered, in consideration of the above information. These are discussed following.

Option 1 – Do Nothing

The study area currently comprises private property used for illegal trail bike riding and 4WDing. Keeping the land in its current condition allows access to the site by people undertaking these activities, which are significantly contributing to the overall disturbance of the area, and thus impacting on cultural material on the ground surface as well as subsurface.

This is considered an inappropriate outcome with significant detrimental effect on the land and the cultural heritage resource within the area. It also does not address the need for additional housing stock on the South Coast of NSW.

Option 2 – Unmitigated Impact

Under Option 2, the proposed development proceeds, allowing development of the study area with no further archaeological work occurring once an AHIP is issued. This would allow numerous surface artefacts to be impacted and likely destroyed during the development, and could also have repercussions for future landowners in the event cultural material is identified while gardening or undertaking similar activities within their lots. It also would result in significant impact to, and loss of, cultural material within the site.

This option is considered inappropriate on the basis of the loss of cultural heritage value within the site and the significant impact it would have on cultural material within the study area.

Option 3 – Further Archaeological Investigation

Option 3 involves undertaking further archaeological investigation in the form of further excavation within the site with the aim of recovering additional information regarding the nature and extent of archaeological deposits within the study area, in order to assist in answering questions regarding Aboriginal use of the area in the past. This would likely take the form of open area salvage excavations to recover as many artefacts as possible. On completion of archaeological works, the proposed development works could proceed as planned.

This option is not warranted due to the limited nature of the subsurface archaeological deposit, along with the highly disturbed nature of the study area. Further archaeological excavation within the site is unlikely to reveal additional information regarding the Aboriginal use of the area in the past and is unlikely to further inform the archaeological record.

Option 4 – Amendment of the Proposed Site Layout

Redesign of the proposed development layout could be an appropriate option to assist in avoiding the identified cultural deposit and ensure development works do not further impact cultural material within the study area. A number of proposals have been formed for the study area over the years and it is noted that significant biodiversity constraints impact where development may occur within the area. The original residential development proposed as part of the planning proposal for the site comprised a much larger development of more than 300 residential lots. The current proposal is for a significantly smaller development area, which avoids a much greater area of identified Aboriginal sensitivity.

The current layout reduces the area to be developed while maximising the area proposed for conservation. The area proposed for conservation incorporates three of the six previously registered sites within the study area in their entirety.Given

previous designs considered for the site, redesign of the layout is considered unlikely to be acceptable on biodiversity grounds, and may result in impacting sites currently proposed to be conserved in situ.

Option 5 – Mitigated Impact

Under Option 5, mitigated impact to the study area would be permitted under an AHIP to sites 58-2-0337 and 58-2-0341. Surface collection of artefacts within the development area would be undertaken in two stages. The artefacts would be catalogued and then returned to site, and relocated within an area that would not be disturbed in future. A significant portion of the study area is proposed to be established as a Community Title Lot for conservation purposes. Impact to this area would not be permitted and thus the artefacts would not be impacted in future. A management plan for the ongoing management of the area would be prepared as a condition of the DA for the site. On completion of archaeological mitigation measures, the proposed development works could proceed as planned.

This is considered the most appropriate option for the site, as it allows the additional housing stock for the area to be developed in an archaeologically sensitive manner. The cultural material present within the site is located in a highly disturbed context, and none of the artefacts are considered to be located within their primary depositional context. Thus, collection and relocation of the artefacts allows them to remain on Country, in line with the wishes of the Aboriginal community, and ensures further harm will not occur to the artefacts.

This option (Option 5) is considered the most appropriate for the site.

9.3 Mitigation Measures

The proposed development is constrained to part of the western portion of the study area, and a significant amount (approximately >70%) is proposed to be established as a Community Title Lot. This area would not be impacted by development. Three of the seven previously registered Aboriginal sites (AHIMS sites 58-2-0338, 58-2-0339, 58-2-0241) are located within this conservation area and would not be further impacted by the proposed development. This is an excellent conservation outcome for these sites, despite their disturbed context. Portions of 58-2-0337 and 58-2-0340/58-2-0341 would also be conserved within the community title lot, which is also considered an excellent conservation outcome.

As discussed above, the study area is highly disturbed across the majority, if not the entirety, of the proposed impact area, and thus further archaeological excavations are not considered appropriate or warranted. However, a staged surface collection within the proposed development area is considered appropriate, in order to prevent further impact to the cultural material within the site prior to development occurring.

9.3.1 Staged Surface Collection

The staged surface collection program is proposed to involve two stages, with Stage 1 comprising a surface collection over the entirety of the impact area to collect all visible surface artefacts associated with site 58-2-0337 and 58-2-0341. On completion of surface collection and salvage within the proposed development area, the required vegetation clearing could be undertaken by the proponent, in line with any approved Vegetation Management Plan (VMP) for the site, along with initial ground disturbing works. As the site has been churned by 4WD access over many years, artefacts are present within the subsurface deposit, but with no archaeological integrity. As such, initial ground disturbing works would potential expose additional archaeological material within the impact area.

Once this is completed, Stage 2 could be implemented, whereby any additional artefacts which may have been obscured or revealed by the removal of vegetation and initial ground disturbing works are collected within the impact area. It is not proposed to monitor the earthworks being undertaken, but to come in shortly after initial works are completed and undertake the surface collection at that point.

Once both stages of surface collection are completed, the collected artefacts would be analysed by a lithic expert to compile a catalogue, and to determine if the assemblage is able to provide any further information regarding the Aboriginal use of the area. On completion of analysis, the artefacts would be returned to Country and either scattered on the ground surface or reburied, in line with the wishes of the Aboriginal community. If reburied, the requirements of the Code of Practice for the reburial of artefacts would be implemented. Regardless if the artefacts were reburied or scattered on the surface, the location would be recorded and a site card submitted to AHIMS to document the location of the artefacts.

The surface collection would require an AHIP to permit impact to the artefacts. The surface collection could not be undertaken until any DA for the proposed works is issued.

Given the current level of public access to the site, and the impact that use for trail bike riding, 4WDing, and anecdotal evidence received from residents regarding annual motorbike races within the site, there is a real concern regarding the ongoing impact to surface artefacts within the site.

A full methodology for undertaking surface collection is attached in Appendix K.

9.3.2 Management Plan

With regard to the four sites within the Community Title Lot, a management plan is proposed to be prepared as a condition of the DA. Suggested wording for this management plan with regard to Aboriginal cultural heritage is included in Appendix L, and has been designed to ensure no further impact occurs to these areas. This includes appropriate weed management programs, ensuring minimally invasive

methods are utilised as part of weed management activities – for example, woody weeds should be cut at ground level and poisoned rather than having their roots removed from the ground and further disturbing the ground surface. Development for public recreation, such as walking tracks, playgrounds, toilets, or other publicly accessible facilities, would require additional archaeological assessment prior to any works occurring and should be avoided wherever possible.

10.0 Permit Requirements

10.1 Permit Area

An application for an AHIP under Part 6 of the *National Parks and Wildlife Act 1974* is required for the site at Inyadda Drive, Manyana, NSW, prior to the commencement of required upgrade works. The study area is further defined as Lot 2 DP 1161638, Lot 106 DP 755923, and Lot 2 DP 1121854, and the proposed impact area is contained within these cadastral boundaries. Figure 23 shows the proposed AHIP boundary, and Table 19 lists the grid references for the proposed AHIP boundaries in GDA/MGA 94, Zone 56. These grid references are also provided on Figure 23.

Table 19: Grid references for study area boundary

Point	Easting	Northing
1	273,980.12	6,096,274.41
2	274,157.09	6,096,247.58
3	274,308.99	6,096,197.76
4	274,369.38	6,096,199.42
5	274,429.17	6,096,249.21
6	274,504.75	6,096,444.99
7	274,510.95	6,096,451.60
8	274,521.56	6,096,452.44
9	274,690.91	6,096,217.30
10	274,689.91	6,096,209.55
11	274,685.59	6,096,204.39
12	274,374.40	6,096,089.77
13	274,345.20	6,096,082.61
14	274,339.24	6,096,081.97
15	274,357.86	6,095,976.93
16	274,351.70	6,095,977.79
17	274,382.31	6,095,968.80
18	274,404.00	6,095,950.98
19	274,484.33	6,095,846.48
20	274,508.79	6,095,855.75
21	274,839.98	6,095,808.49
22	274,846.78	6,095,843.15
23	274,912.83	6,095,833.07
24	274,904.49	6,095,789.68
25	274,508.37	6,095,844.08
26	274,434.10	6,095,811.37
27	273,995.66	6,095,871.59
28	274,014.45	6,095,978.56
29	273,935.55	6,095,989.67
30	273,943.19	6,096,041.56
31	273,958.47	6,096,128.36

The proposed AHIP boundary includes the proposed development and impact area within the overall study area.

10.2 Permit Type

It is recommended that any AHIP issued for development works within the study area should permit a two staged surface collection of artefacts within the impact area, one pre- and one post-vegetation removal within the impact footprint. On completion of both stages of surface collection, the AHIP should permit development works to proceed with no further mitigation required.

10.3 AHIMS Numbers

A total of six AHIMS sites fall within the study area, with another registered outside the boundaries but extending into the study area, for a total of seven relevant registered sites. Four of these sites would be partially or totally impacted by the proposed development, while the remaining three would not be impacted.

Table 20 provides a summary of the impact to sites within the study area as part of the proposed development.

Table 20: Impact assessment summary

Site number	Type of harm	Degree of harm	Consequence of harm
58-2-0241	None	None	No loss of value
58-2-0337	Partial	Partial	Partial loss of value
58-2-0338	None	None	No loss of value
58-2-0339	None	None	No loss of value
58-2-0340	Partial	Partial	Partial loss of value
58-2-0341	Partial	Partial	Partial loss of value
58-2-0396	Partial	Partial	Partial loss of value

10.4 Previous AHIPs

No AHIPs have been issued or refused previously for the study area to the best of our knowledge, although it is noted that at least one AHIP has been issued for sites in the immediate vicinity and a test excavation permit was issued to Navin Officer in 2005 for test excavations at CS19 (58-2-0396) and 58-2-0241, as well as a number of other sites well outside the current study area.

10.5 Restricted Information and Confidentiality

Aboriginal stakeholders for the project have not identified any restricted, confidential or culturally sensitive information related to the project and this AHIP application.

10.6 Copyright

professional activities (including but not limited to professional presentations, academic papers and/or publications).

10.7 Artefact Management

The artefacts recovered during the test excavation and collected during the proposed works should be reburied on site within an appropriate location that will not be further impacted. The location of these items would be registered with AHIMS. An appropriate location would be determined in consultation with the Aboriginal community and the proponent to ensure an area unlikely to be impacted in future is selected. It is likely that an already disturbed area with no evidence of archaeological material would be selected.

AHIP_BP	Easting	Northing
1	273,980.12	6,096,274.41
2	274,157.09	6,096,247.58
3	274,308.99	6,096,197.76
4	274,369.38	6,096,199.42
5	274,429.17	6,096,249.21
6	274,504.75	6,096,444.99
7	274,510.95	6,096,451.6
8	274,521.56	6,096,452.44
9	274,690.91	6,096,217.3
10	274,689.91	6,096,209.55
11	274,685.59	6,096,204.39
12	274,374.4	6,096,089.77
13	274,345.2	6,096,082.61
14	274,339.24	6,096,081.97
15	274,357.86	6,095,976.93
16	274,351.7	6,095,977.79
17	274,382.31	6,095,968.8
18	274,404	6,095,950.98
19	274,484.33	6,095,846.48
20	274,508.79	6,095,855.75
21	274,839.98	6,095,808.49
22	274,846.78	6,095,843.15
23	274,912.83	6,095,833.07
24	274,904.49	6,095,789.68
25	274,508.37	6,095,844.08
26	274,434.1	6,095,811.37
27	273,995.66	6,095,871.59
28	274,014.45	6,095,978.56
29	273,935.55	6,095,989.67
30	273,943.19	6,096,041.56
31	273,958.47	6,096,128.36

PO Box 236
NOWRA
NEW SOUTH WALES 2541

0 265 530

metres

Projection:
MGA Zone 56 (GDA 94)
Base Map:
NearMaps 2022
Image Date: 07/05/2022
Final - Version 1

Figure 21: AHIP Boundary

N

11.0 RECOMMENDATIONS

The following recommendations are made on the basis of:

- The statutory requirements of the NP&W Act 1974;
- The requirements of Heritage NSW;
- The results of the cultural and archaeological assessment;
- An assessment of the likely impacts of the proposed development; and
- The interests of the registered Aboriginal stakeholders and the cultural heritage record.

It was found that:

- There are six previously registered Aboriginal sites within the study area and a seventh outside the boundaries that extends into the study area.
- A number of artefact concentrations were identified on the ground surface within the study area.
- Test excavations identified a low density subsurface deposit associated with Manyana 1 (AHIMS #58-2-0337).
- The majority of artefacts identified on the ground surface and during test excavations were formed from silcrete, considered to have likely been sourced from locally available raw material.
- All artefacts identified were considered to be in a secondary depositional context.
- No intact deposits were identified within the proposed development area.
- Three of the seven sites would not be impacted by the proposed subdivision works.
- Of the sites proposed to be impacted, four would be partially impacted.
- All sites within the study area can be at least partially conserved.
- A number of management options were considered for the site, and mitigated impact through a staged surface collection, along with avoidance of three of the seven previously registered sites within the study area, is considered the appropriate management strategy for the site.
- The proposed development is necessary in order to provide additional housing stock within the South Coast region.

Based on the above conclusions, the following recommendations have been made.

RECOMMENDATION 1: AHIP APPLICATION REQUIRED

Aboriginal cultural material is present within the study area in a highly disturbed context. The development area was not assessed as possessing intact areas with potential for Aboriginal cultural material or deposits to be present. The proposed development does not avoid all the Aboriginal cultural material within the site and thus an application for an Aboriginal Heritage Impact Permit (AHIP) is required to

permit harm to these items, namely sites 58-2-0337, 58-2-0340, 58-2-0341 and 58-2-0396.

Recommendation 2: Surface Collection

Due to the nature of the archaeological deposit within the proposed development area, appropriate mitigation measures have been proposed. A two staged surface collection process for sites 58-2-0337, 58-2-0340 and 58-2-0341 is recommended, as follows:

- Undertake collection of surface artefacts visible across the proposed impact area within the study area.
- Clearing of vegetation within the proposed impact area is completed, in line with the project approval.
- A second collection of surface artefacts is undertaken across the exposed areas to ensure cultural material is not further impacted.
- Following analysis and cataloguing, artefacts are reburied on site within an area proposed for conservation.
- No further archaeological work is recommended for the site due to the level of disturbance present.

Recommendation 3: Avoid Impact to Sites Outside Development Area

Four of the seven Aboriginal sites within the study area can be avoided by the proposed development works; namely sites 58-2-0241, 58-2-0338, and 58-2-0339. The sites will be located within the Community Title Lot and a management plan will be prepared as a condition of the DA for the development. Suggested wording has been attached as Appendix L.

Recommendation 4: Maintain Aboriginal Community Consultation

Consultation with the RAPs regarding the project should continue, in order to keep the RAPs informed about the management of Aboriginal cultural heritage within the study area. This includes notifying the RAPs when an AHIP application is lodged, and also in the event an AHIP is issued.

Recommendation 5: Development Boundaries

The proposed development works must be contained within the assessed boundaries for this project. If there is any alteration to the boundaries of the proposed development to include areas not assessed as part of this archaeological investigation, further investigation of those areas may be necessary to assist in appropriately managing Aboriginal objects and places which may be present.

Recommendation 6: Stop Work Provision

Should unanticipated Aboriginal archaeological material be encountered during site works after the recommended mitigation measures have been completed in accordance with an approved AHIP, all work must cease in the vicinity of the find and an archaeologist contacted to make an assessment of the find and to advise on

the course of action to be taken. Further archaeological assessment and Aboriginal community consultation may be required prior to the recommencement of works. Any objects confirmed to be Aboriginal in origin must be reported to Heritage NSW.

In the unlikely event that suspected human remains are identified during construction works, all activity in the vicinity of the find must cease immediately and the find protected from harm or damage. The NSW Police and the Coroner's Office must be notified immediately. If the finds are confirmed to be human and of Aboriginal origin, further assessment by an archaeologist experienced in the assessment of human remains and consultation with both Heritage NSW and the RAPs for the project would be required.

This recommendation should be included in any Construction Environmental Management Plan (CEMP) developed for the site.

RECOMMENDATION 7: REPORTING

One digital copy of this report should be forwarded to Heritage NSW to support the required AHIP application for the project, along with required supporting documentation.

One digital copy of this report should be forwarded to Heritage NSW for inclusion on the Aboriginal Heritage Information Management System (AHIMS).

One copy of this report should be forwarded to each of the registered Aboriginal stakeholders for the project.

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