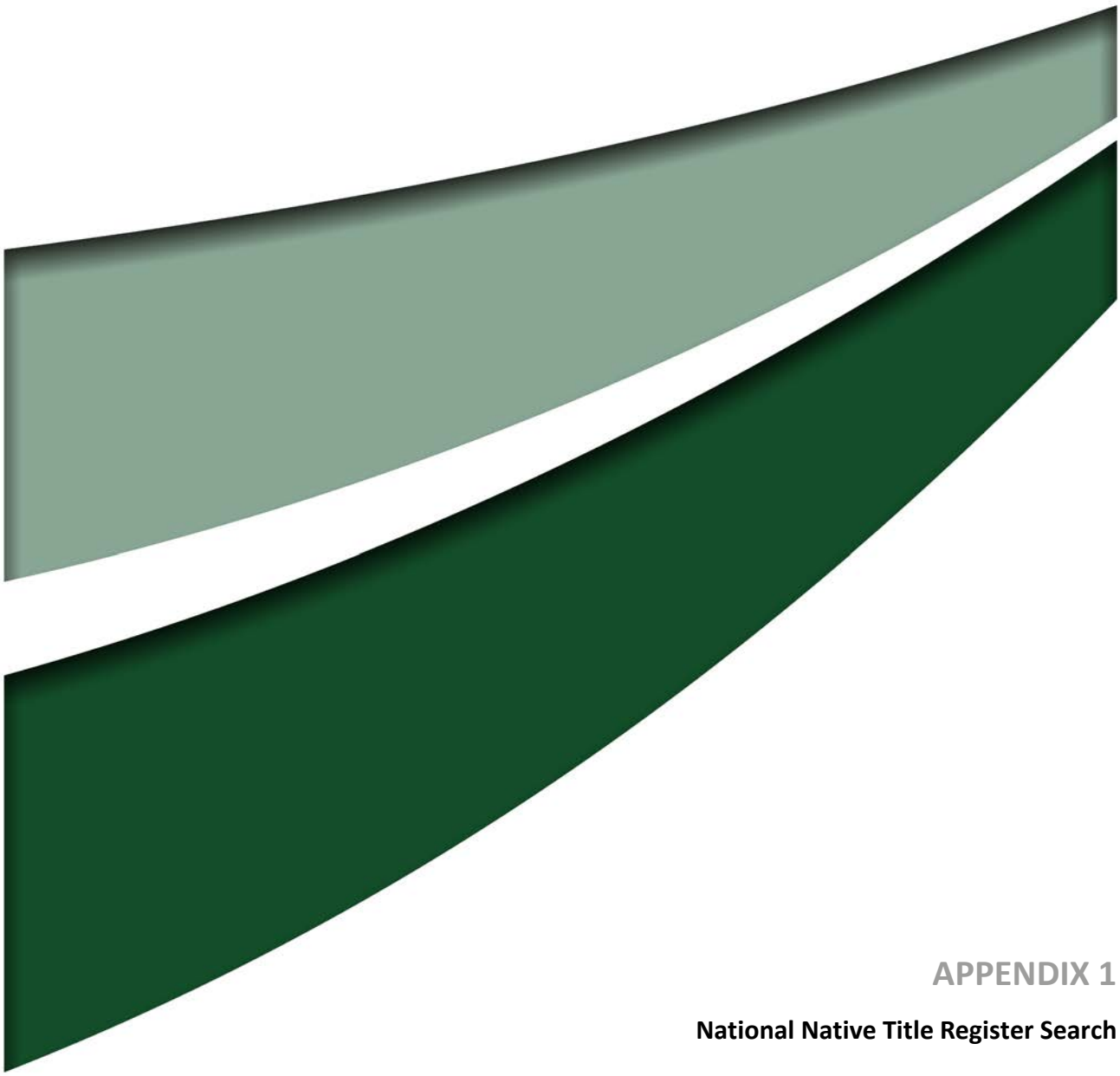


APPENDIX 1

National Native Title Register Search

National
Native Title
Tribunal

Sydney Office, Operations East
Level 16, Law Courts Building
Queens Square
Sydney NSW 2000
GPO Box 9973
Sydney NSW 2001
Telephone (02) 9227 4000
Facsimile (02) 9227 4030

26 August 2015

Kirwan Williams
Archaelogist
Umwelt (Australia) Pty Limited
Email: kwilliams@umwelt.com.au

Our Ref: -15NM

Dear Mr Williams

Native Title Search Results for Eurobodalla Local Government Area

Thank you for your search request received on 26 August 2015 in relation to the above area.

Search Results
The results provided are based on the information you supplied and are derived from a search of the following Tribunal databases:

Register Type	**NNTT Reference Numbers**
Schedule of Applications (unregistered claimant applications)	Nil.
Register of Native Title Claims	Nil.
National Native Title Register	Nil.
Register of Indigenous Land Use Agreements	Nil

At the time this search was carried out, there were **no relevant entries** in the above databases.

Please note: There may be a delay between a native title determination application being lodged in the Federal Court and its transfer to the Tribunal. As a result, some native title determination applications recently filed with the Federal Court may not appear on the Tribunal's databases.

Tribunal accepts no liability for reliance placed on enclosed information
The enclosed information has been provided in good faith. Use of this information is at your sole risk. The National Native Title Tribunal makes no representation, either express or implied, as to

the accuracy or suitability of the information enclosed for any particular purpose and accepts no liability for use of the information or reliance placed on it.

If you have any further queries, please do not hesitate to contact me on the numbers listed below.

Yours sincerely

Nicole Maher | REGIONAL COORDINATOR
National Native Title Tribunal | Sydney Office
Level 16, Federal Law Courts Building, Queens Square, Sydney, New South Wales 2000
Telephone (02) 9227 4008 | Facsimile (02) 9227 4030 | Email nicole.maher@nntt.gov.au
Freecall 1800 640 501 | www.nntt.gov.au
Shared country, shared future.

Searching the NNTT Registers in New South Wales

Search service
On request the National Native Title Tribunal may search its public registers for you. A search may assist you in finding out whether any native title applications (claims), determinations or agreements exist over a particular area of land or water.

In New South Wales native title cannot exist on privately owned land including family homes or farms.

What information can a search provide?
A search can confirm whether any applications, agreements or determinations are registered in a local government area. Relevant information, including register extracts and application summaries, will be provided.

Most native title applications do not identify each parcel of land claimed. They have an external boundary and then identify the areas not claimed within the boundary by reference to types of land tenure e.g., freehold, agricultural leasehold, public works.

What if the search shows no current applications?
If there is no application covering the local government area this only indicates that at the time of the search either the Federal Court had not received any claims in relation to the local government area or the Tribunal had not yet been notified of any new native title claims.

It does not mean that native title does not exist in the area.

Native title may exist over an area of land or waters whether or not a claim for native title has been made.

Where the information is found
The information you are seeking is held in three registers and on an applications database.

National Native Title Register
The National Native Title Register contains determinations of native title by the High Court, Federal Court and other courts.

Register of Native Title Claims
The Register of Native Title Claims contains applications for native title that have passed a registration test.

Registered claims attract rights, including the right to negotiate about some types of proposed developments.

Register of Indigenous Land Use Agreements
The Register of Indigenous Land Use Agreements contains agreements made with people who hold or assert native title in an area.

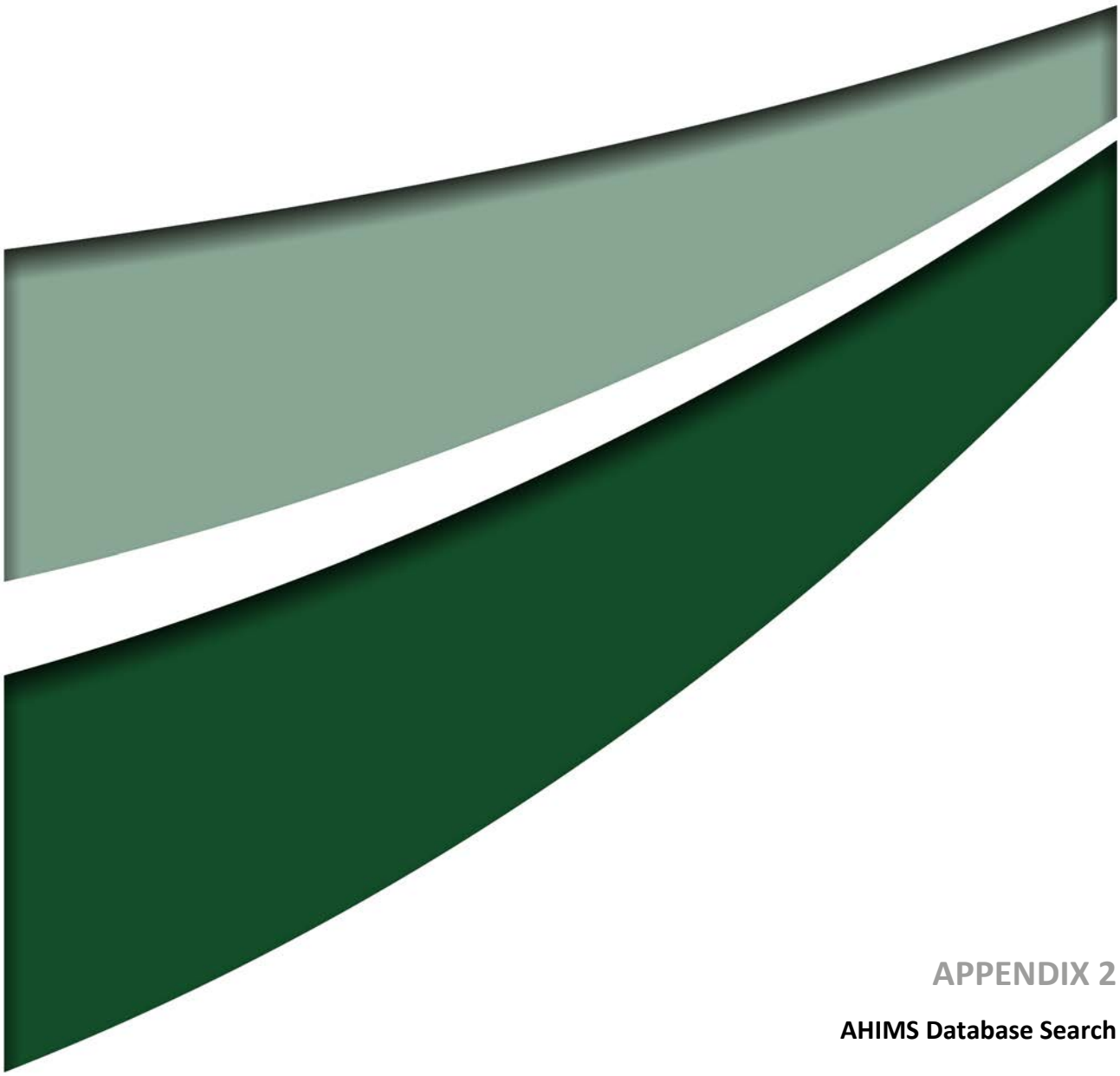
The register identifies development activities that have been agreed by the parties.

Schedule of Native Title Claims
The Schedule of Native Title Claims contains a description of the location, content and status of a native title claim.

This information may be different to the information on the Register of Native Title Claims, e.g., because an amendment has not yet been tested.

How do I request a native title search?
Download the Search Request Form from the Tribunal's website at - http://www.nntt.gov.au/assistance/Pages/Searches-and-providing-Register-information.aspx

Email to: NSWEnquiries@nntt.gov.au
Post to: GPO Box 9973 Sydney NSW 2001
For additional enquiries: 02 9227 4000



APPENDIX 2

AHIMS Database Search

AHIMS Web Services (AWS)

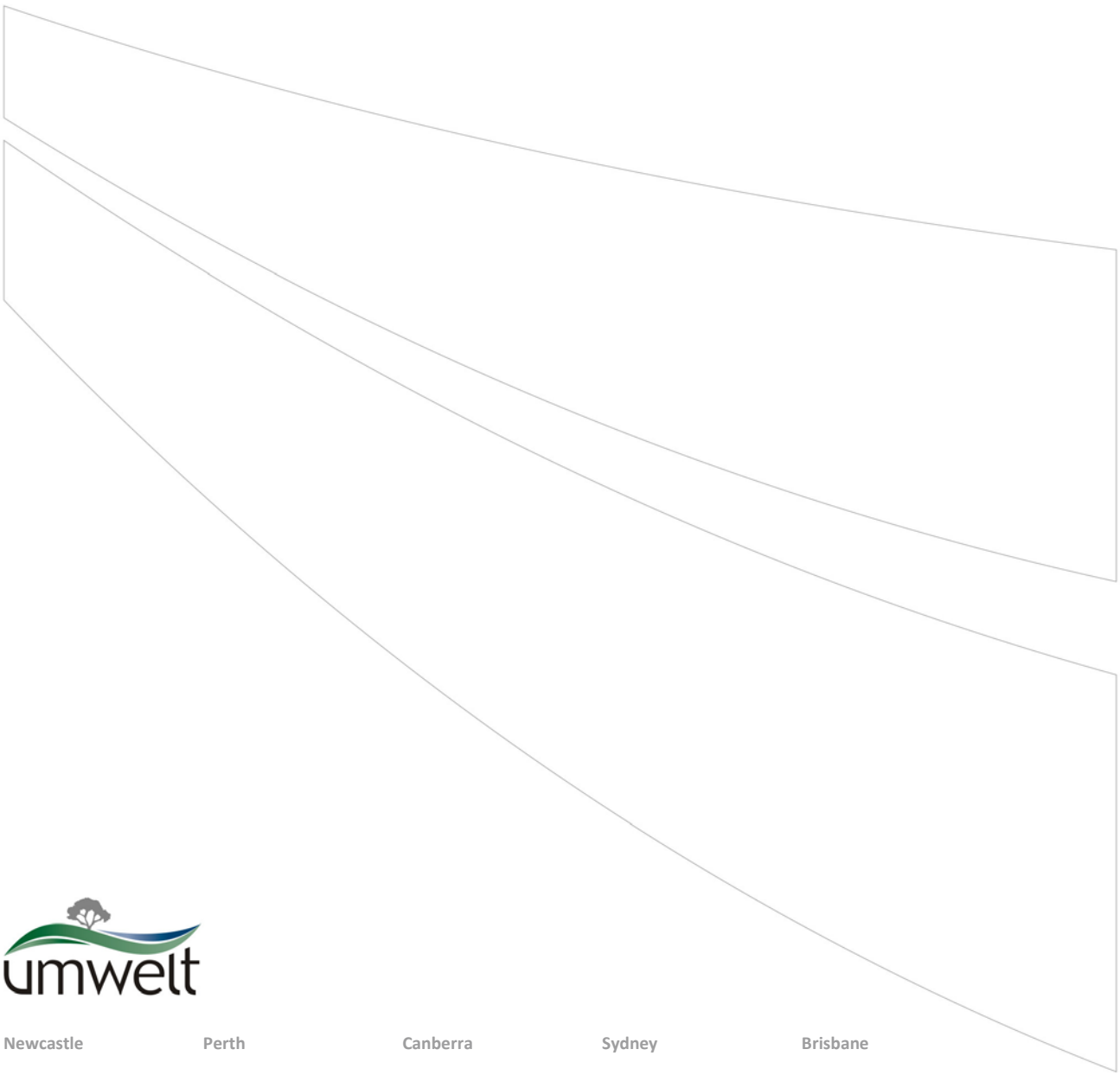
Purchase Order/Reference : 8081

Client Service ID : 186680

Note: This Excel report shows the sites found in AHIMS on the 21/08/2015. If this date is not the same as the original date of the Search Results letter obtained during the Basic Search, then the search results might be different. The PDF version of this report will always coincide with the Basic Search Results letter.

Site ID	Site name	Datum	Zone	Easting	Northing	Context	Site status	Primary contact	Site features	Site types	Recorders	Reports	Permits	Longitude GDA94	Latitude GDA94
58-4-0719	PB 130;	AGD	56	240720	6054620	Open site	Valid		Artefact : -	Open Camp Site	Philip Boot	99058		150.14	-35.62
58-4-0720	PB 131;	AGD	56	241340	6056160	Open site	Valid		Artefact : -	Open Camp Site	Philip Boot,Biosis Pty Lt	99058		150.15	-35.60
58-4-0526	Holmes Lookout A1;	AGD	56	243180	6047420	Open site	Valid		Artefact : -	Open Camp Site	Annie Nicholson			150.16	-35.68
58-4-0238	89/PK/33;	AGD	56	242300	6051300	Open site	Valid		Artefact : -	Open Camp Site	Mr.Peter Kuskie			150.15	-35.65
58-4-0239	89/PK/32;	AGD	56	242350	6051350	Open site	Valid		Artefact : -	Open Camp Site	Mr.Peter Kuskie			150.16	-35.65
58-4-0240	89/PK/29;	AGD	56	242400	6052200	Open site	Valid		Artefact : -	Open Camp Site	Mr.Peter Kuskie			150.16	-35.64
58-4-0241	89/PK/28;	AGD	56	242200	6051400	Open site	Valid		Artefact : -	Open Camp Site	Mr.Peter Kuskie			150.15	-35.65
58-4-0243	89/PK/27;	AGD	56	241700	6051700	Open site	Valid		Artefact : -	Open Camp Site	Mr.Peter Kuskie			150.15	-35.64
58-4-0244	89/PK/26;	AGD	56	241600	6051800	Open site	Valid		Artefact : -	Open Camp Site	Mr.Peter Kuskie			150.15	-35.64
58-4-0245	89/PK/24;	AGD	56	241100	6051800	Open site	Valid		Artefact : -	Open Camp Site	Mr.Peter Kuskie			150.14	-35.64
58-4-0482	River Rod;	AGD	56	240700	6054600	Open site	Valid		Artefact : -	Open Camp Site	P.J Arncliffe			150.14	-35.62
58-4-0280	89/DM/38;Benandarah	AGD	56	243300	6049700	Open site	Valid		Artefact : -	Open Camp Site	D McKeown			150.17	-35.66
58-4-0288	89/DM/20;Boyne State	AGD	56	245200	6052700	Open site	Valid		Artefact : -	Open Camp Site	D McKeown			150.19	-35.63
58-4-0423	No_3;	AGD	56	236400	6051400	Open site	Valid		Artefact : -	Open Camp Site	W.J Hackwell	1997		150.09	-35.64
58-4-0424	No1+2;	AGD	56	236600	6051700	Open site	Valid		Artefact : -	Open Camp Site	W.J Hackwell	1997		150.09	-35.64
58-4-0237	89/PK/35;	AGD	56	242350	6050950	Open site	Valid		Artefact : -	Open Camp Site	Mr.Peter Kuskie			150.16	-35.65
58-4-0692	Liamena 4;	AGD	56	245900	6047300	Open site	Valid		Artefact : -	Open Camp Site	Mr.Peter Kuskie		767	150.19	-35.68
58-4-0693	Liamena 3;	AGD	56	245950	6047130	Open site	Valid		Artefact : -	Open Camp Site	Mr.Peter Kuskie		767	150.19	-35.69
58-4-0694	Liamena 2;	AGD	56	245950	6046730	Open site	Valid		Artefact : -	Isolated Find	Mr.Peter Kuskie		767	150.19	-35.69
58-4-0695	Liamena 1;	AGD	56	246150	6046730	Open site	Valid		Artefact : -	Open Camp Site	Mr.Peter Kuskie		767	150.20	-35.69
58-4-0651	UM 4	AGD	56	243500	6047300	Open site	Valid		Artefact : -	Open Camp Site	Robert Paton	2253		150.17	-35.68
58-4-0659	CR-4	AGD	56	245650	6046700	Open site	Valid		Artefact : 3, Shell : 1	Open Camp Site	Mr.Doug Williams	2319	438,679	150.19	-35.69
58-4-0660	CR-2	AGD	56	245230	6047360	Open site	Valid		Artefact : 15, Shell : 10	Open Camp Site	Mr.Doug Williams	2319	531,549,679	150.19	-35.68
58-4-0661	CR-3	AGD	56	245500	6047000	Open site	Valid		Artefact : 4	Open Camp Site	Mr.Doug Williams	2319	679	150.19	-35.69
58-4-0987	TR 23	AGD	56	241350	6055110	Open site	Valid		Artefact : 1		Philip Boot,Biosis Pty Lt	98358,98359,98360,99058		150.15	-35.61
58-4-0955	KPH2	AGD	56	245260	6046380	Open site	Valid		Artefact : 30		Ms.Trish Saunders	98990	2099,2100	150.19	-35.69
58-4-0242	89/PK/39;	AGD	56	243300	6049700	Open site	Valid		Artefact : -	Open Camp Site	Mr.Peter Kuskie			150.17	-35.66
58-4-0899	surfside 1	AGD	56	245930	6046460	Open site	Valid		Artefact : -	Open Camp Site	Vivienne Wood			150.19	-35.69
58-4-0900	Surfside 2	AGD	56	245960	6046450	Open site	Valid		Shell : -, Artefact : -	Midden	D Wood			150.19	-35.69
58-3-0003	N12	AGD	56	246250	6046700	Open site	Valid		Artefact : -	Open Camp Site	N.K Hall			150.20	-35.69
58-4-1069	PAD 3 (cnr Princes/Kin	AGD	56	245500	6046500	Open site	Partially Destroyed		Potential Archaeological Deposit (PAD) : 1		Ms.Trish Saunders,Doc	98246,98990	1927,1928,2099,2100	150.19	-35.69
58-4-1070	PAD 4 (cnr Princes/Kin	AGD	56	245370	6046730	Open site	Partially Destroyed		Potential Archaeological Deposit (PAD) : 1		Ms.Trish Saunders,Doc	98246,98990	1927,1928,2099,2100	150.19	-35.69
58-4-1071	PAD 5 (cnr Princes/Kin	AGD	56	245335	6047000	Open site	Partially Destroyed		Potential Archaeological Deposit (PAD) : 1		Ms.Trish Saunders,Doc	98246,98990	1927,1928,2099,2100	150.19	-35.69
58-4-1072	PAD 6 (cnr Princes/Kin	AGD	56	245160	6047050	Open site	Partially Destroyed		Potential Archaeological Deposit (PAD) : 1		Ms.Trish Saunders,Doc	98246,98990	1927,1928,2099,2100	150.19	-35.69
58-4-1073	PAD 7 (cnr Princes/Kin	AGD	56	245100	6047340	Open site	Partially Destroyed		Potential Archaeological Deposit (PAD) : 1		Ms.Trish Saunders,Doc	98246,98990	1927,1928	150.18	-35.68
58-4-1109	KPH6 (PAD4)	AGD	56	245345	6046707	Open site	Valid	T Russell	Artefact : 1		Ms.Trish Saunders	98990	2099,2100	150.19	-35.69
58-4-1110	KPH7 (PAD5)	AGD	56	245360	6046985	Open site	Valid	T Russell	Artefact : 3, Shell : 1		Ms.Trish Saunders	98990	2099,2100	150.19	-35.69
58-4-1111	KPH8 (PAD6)	AGD	56	245500	6047045	Open site	Valid	T Russell	Artefact : 1		Ms.Trish Saunders	98990	2099,2100	150.19	-35.69
58-4-1263	KPH3A	AGD	56	245370	6046390	Open site	Valid		Artefact : 1		Ms.Trish Saunders			150.19	-35.69
58-4-1264	CR-1	AGD	56	244860	6047600	Open site	Valid		Artefact : 2		Mr.Doug Williams	2319		150.18	-35.68
58-4-1282	Redgum Camp 1 and 2	GDA	56	242156	6048982	Open site	Valid		Shell : 50		Miss.Kristine Carriage	101392	3131	150.15	-35.67
58-4-1281	Beach Camp Clyde Riv	GDA	56	240317	6046502	Open site	Valid		Shell : -, Artefact : -		Miss.Kristine Carriage	101392	3131	150.13	-35.69
58-4-0236	89/PK/38;	AGD	56	242850	6050400	Open site	Valid		Artefact : -	Open Camp Site	Mr.Peter Kuskie			150.16	-35.66
58-4-1160	232/3	AGD	56	236520	6052590	Open site	Valid	T Russell	Artefact : -		State Forests of NSW - Batemans Bay			150.09	-35.63
58-4-1161	232/2	AGD	56	236530	6053080	Open site	Valid	T Russell	Artefact : -		State Forests of NSW - Batemans Bay			150.09	-35.63
58-4-1166	232/1	AGD	56	236630	6053060	Open site	Valid	T Russell	Artefact : -		State Forests of NSW - Batemans Bay			150.09	-35.63
58-4-1340	Benandarah SU1/L1	GDA	56	241189	6052917	Open site	Valid		Artefact : -		Doctor.Julie Dibden	103024,103025	3700	150.14	-35.63
58-4-1341	Benandarah SU1/L2	GDA	56	241696	6052796	Open site	Valid		Artefact : 2		Doctor.Julie Dibden	103024,103025	3700	150.15	-35.63

Report generated by AHIMS Web Service on 21/08/2015 for Kirwan Williams for the following area at Datum :GDA, Zone : 56, Eastings : 236500 - 246500, Northings : 6046500 - 6056500 with a Buffer of 50 meters. Additional Info : To inform an Archaeological Assessment. Number of Aboriginal sites and Aboriginal objects found is 48



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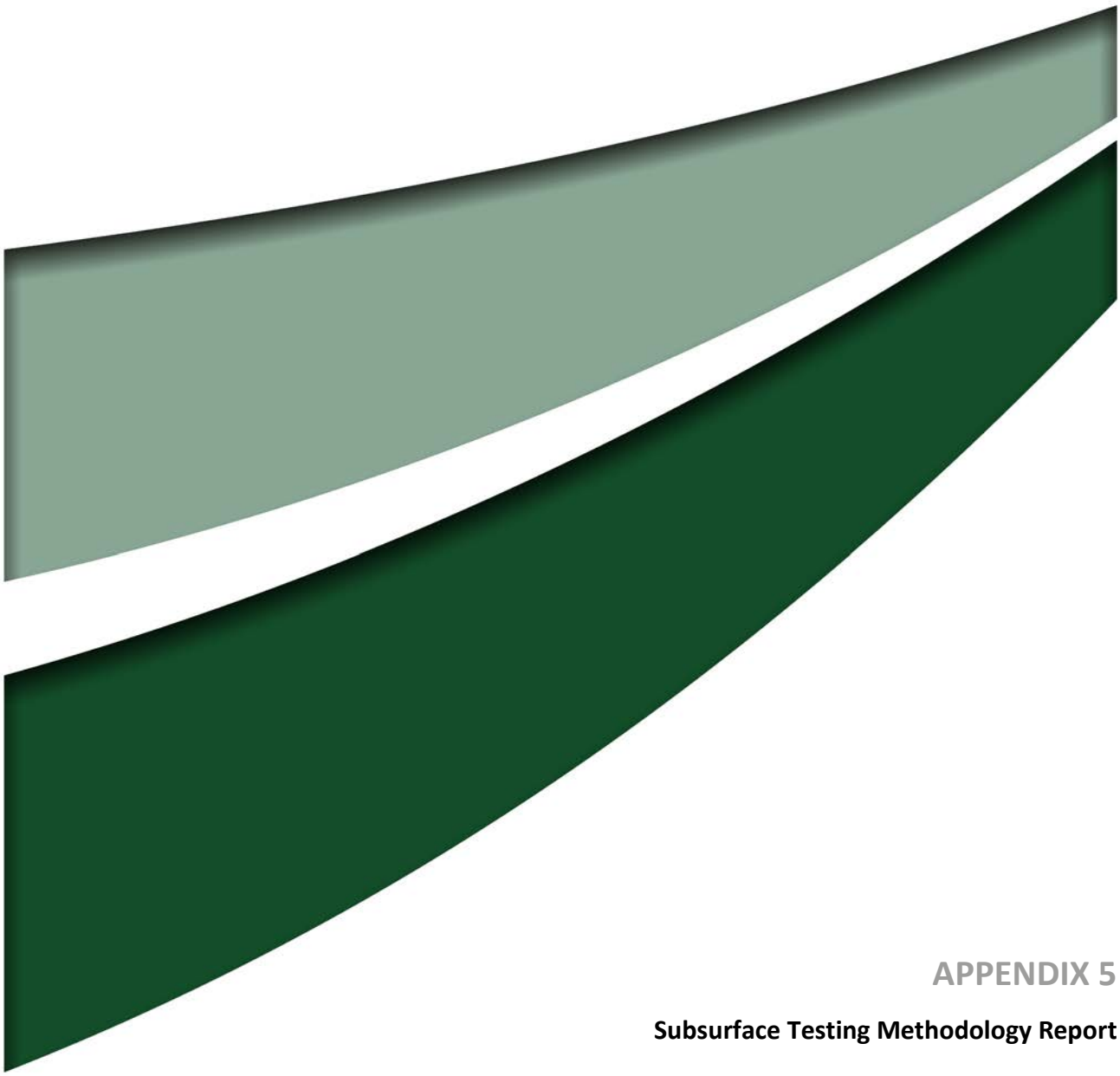

APPENDIX 5

Subsurface Testing Methodology Report

umwelt

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Quality outcomes

Roads & Maritime

TEST EXCAVATION METHODOLOGY AND SUPPORTING INFORMATION FOR THE NELLIGEN BRIDGE REPLACEMENT, NELLIGEN NSW

FINAL

March 2016

TEST EXCAVATION METHODOLOGY AND SUPPORTING INFORMATION FOR THE NELLIGEN BRIDGE REPLACEMENT, NELLIGEN NSW

FINAL

Prepared by
Umwelt (Australia) Pty Limited
on behalf of
Roads and Maritime Services

Project Director: Jan Wilson
Project Manager: Kym McNamara
Technical Director: Jan Wilson
Technical Manager: Kym McNamara

Report No. 8081/R02/V3
Date: March 2016

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Table of Contents

Figures

Tables

Appendices

1.0 Introduction

The Kings Highway crossing of the Clyde River, Nelligen Bridge, is located on the South Coast of New South Wales, about eight kilometres north-west of Batemans Bay. During routine inspections, Roads and Maritime Services identified deterioration of the supporting concrete pillars under Nelligen Bridge. The strength of the bridge has been assessed and is still able to safely carry normal traffic loads. However, the pillars will weaken over time and the bridge will require significant repairs or replacement.

A range of early investigations and consultation about options to repair or replace the bridge have been completed. The outcome of this work is a new bridge should be built to the north of the existing bridge (the Nelligen Bridge Replacement Project) (refer to **Figure 1.1** for the Locality Plan). The approaches to the bridge would also be realigned. After the new bridge is built the existing bridge would be demolished.

Umwelt Australia Pty Limited (Umwelt) has been engaged by Roads and Maritime as part of the *Roads and Maritime Services procedure for Aboriginal Cultural Heritage Consultation and Investigation* (Roads and Maritime 2011 - PACHCI) Stage 2 process, which includes this Aboriginal archaeological survey report. This report is required to inform the concept design and environmental assessment (EA) for the Nelligen Bridge Replacement Project.

This document is used to provide supporting information to the Office of Environment and Heritage (OEH) to allow them to assess whether the proposed testing methodology is appropriate and compliant with the code.

1.1 Background

The Nelligen Bridge Preliminary Environmental Investigation (PEI) (URS Australia Pty Ltd) was completed for the project in September 2014. In relation to Aboriginal heritage the PEI identified seven Aboriginal sites had been previously recorded and registered with the Office of Environment and Heritage (OEH) Aboriginal Heritage Information Management System (AHIMS) within one kilometre of the study area. None of these sites are located within the current study area.

However, even though there are no recorded sites within the study area, its location on the banks of an important and significant river which is of known Aboriginal heritage value is recognised. It was acknowledged the proposed impact may involve construction on previously undisturbed land and/or the removal of remnant vegetation, including mature stand/s of trees. Therefore it was accepted there was potential to impact on undiscovered Aboriginal values within the study area.

Aboriginal heritage was assessed in terms of the following options:

- Do nothing
- Maintenance of the existing bridge
- Development to the north of the existing bridge
- Development to the south of the existing bridge

It was recommended an Aboriginal Heritage Assessment be undertaken in accordance the Roads and Maritime' Procedure for Aboriginal Cultural Heritage Consultation and Investigation 2011 (PACHCI) for any of the proposed options except for the do nothing option.

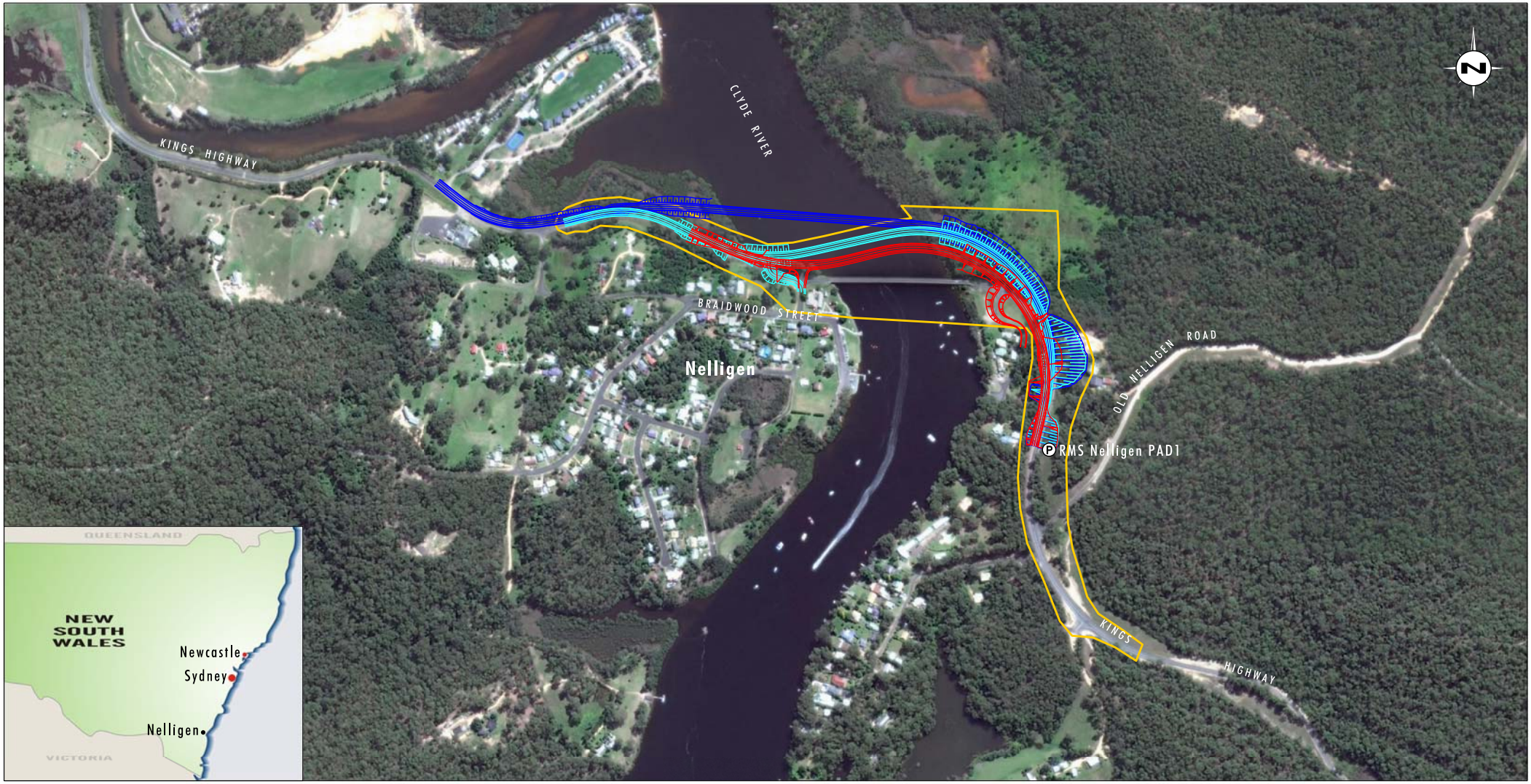

Image Source: Google Earth, DigitalGlobe (2015)
Data Source: NSW Roads and Maritime (2015)

0 100 250 500m
1:10 000

Legend

- Nelligen Bridge - Aboriginal Cultural Heritage Study Area
- Option 1
- Option 2 (preferred option)
- Option 3
- Ⓟ PAD Location

FIGURE 1.1

Locality Plan

File Name (A4): R01/8081_001.dgn
20160210 13.15

1.2 Description of Proposed Development

Roads and Maritime proposes to construct:

- A new Kings Highway crossing of the Clyde River at Nelligen to the north of the existing bridge
- Realign the approaches to the bridge and
- Demolish the existing bridge.

The extent of the required investigation area is from 900 metres east of the existing bridge to 950 metres west of the existing bridge as measured along the Kings Highway.

The work would involve:

- Construction within the Clyde River
- Excavation of cut embankments
- Construction of fill embankments on both sides of the Clyde River
- Temporary stockpile sites
- Temporary compound sites
- Temporary sediment basins
- Operational water quality treatments
- Relocation of utilities
- Clearing of vegetation
- Landscaping/revegetation on completion of the road work.

The exact location of temporary stockpile, compound sites and sediment basins is not known at this stage however potential locations have been identified within the study area and have been inspected accordingly.

2.0 Aboriginal Consultation

Consultation with Aboriginal stakeholders is an integral part of identifying and assessing the significance of Aboriginal objects and/or places, and determining and carrying out appropriate strategies to mitigate the impact upon Aboriginal heritage.

Jeffery Nelson (Roads and Maritime), Tim Webster (Roads and Maritime) and Kym McNamara (Umwelt) undertook the following Aboriginal consultation as part of the project.

2.1 National Native Title Register Search

A search of the NNTTs National Native Title Register to identify any registered native title claimants or native title holders for the study area was conducted on 26 August 2015. The geographic parameters for the search was set to the Eurobodalla LGA (refer to **Appendix 1**). The search returned no relevant entries in the following databases:

- Schedule of Applications (unregistered claimant applications)
- Register of Native Title Claims
- National Native Title Register
- Register of Indigenous Land Use Agreements

2.2 Register of Aboriginal Owners Search

A search of the Register of Aboriginal Owners was conducted on 17 November 2015 by Tim Webster (Roads and Maritime). The results returned on 3 December 2015 outlined the study area did not appear to have Registered Aboriginal Owners pursuant to Division 3 of the *Aboriginal Land Rights ACT 1983* (NSW).

2.3 Batemans Bay Local Aboriginal Land Council

The study area lies within the boundaries of the BBLALC area. BBLALC was identified as the sole key Aboriginal stakeholder for the project as part of the PACHCI Stage 2 process. Initial contact was made by Tim Webster on 24 September 2015 to organise availability for the field survey. Les Simon from BBLALC participated in the field survey for the project. He provided further information on significance of the study area on the 8 January 2016.

3.0 Aboriginal Cultural, Ethnographic and Archaeological Context

This section of the report provides an Aboriginal cultural, ethnographic and archaeological context for the study area. This is then used to formulate the survey methodology and predictive model for site location, site type and site preservation within the study area (refer to **Sections 5.0** and **7.0**).

3.1 Ethnography

Early historic documents relating to Aboriginal people are referred to as ethnohistoric records. Ethnohistoric records from the South Coast area surrounding Nelligen document various elements of Aboriginal society including population, ceremonial and cultural practices, gatherings, material uses and food sources. The study area lies within the tribal country of the Yuin (Djuin) people which was further divided into thirteen sub-tribal groupings. This country extended from the Shoalhaven River in the north, to the Victorian Border in the south and in the west to the eastern edge of the tablelands. The thirteen Yuin sub-tribal groupings are based on the existence of a mythological ancestor "Bundoola" who is said to have had thirteen wives, each representing a different tribal group (Donaldson 2006:7). According to Tindale (1974) the study area lies with the subtribal boundary of the Walbanga people. The Walbanga is a coastal tribe located between the Wandandian and Thaua tribes.

According to oral tradition among South Coast Aboriginal people there were four Yuin tribes. The geographic divisions correspond with the four language groups within the Yuin language family (Eades 1976:1976 1:17). Howitt suggests at contact in the South Coast region the Yuin were divided into two major social divisions, the Kurial-Yuin (North Yuin) and Guyangal-Yuin (South Yuin). There is also a further suggestion there was an inland/coastal division to distinguish tableland and alpine groups from the coast and coastal hinterland (Howitt 1904:82:3).

Within the Yuin area there are two prominent sacred mountains Didthul (Pigeon House Mountain) and Gulaga (Mt. Dromedary) and two rivers Bhundoo (Clyde) and Wadbilliga (Howitt 1904:82:3).

3.1.1 Population

Boot (2002:119) suggests the Yuin people (before European contact) lived a gatherer-hunter lifestyle in semi-permanent camps throughout the now Eurobodalla Local Government Area (LGA). Boot describes the Yuin as a related group of intermarrying clans.

Yuin Culture, as recorded during the eighteenth and nineteenth centuries, was cohesive regardless of hinterland or coastal context. This is evidenced by not only a common subsistence economy throughout the area but also by region wide social, political and religious systems. This is a result of access to an environment characterised by high levels of biodiversity and abundant resources. The high levels of biodiversity and abundant resources allowed frequent large gatherings of people (Boot 2002: 108).

Although the South Coast region was much affected by the introduction of disease after colonisation, with a 95 per cent suggested mortality rate, a healthy population of as many as 25,000 (or a population density of 1.6 persons/sq kilometre) has been indicated from early 19th century census returns. This population is thought to have been evenly distributed across both coastal and hinterland areas (Boot 2002:1).

It has also been possible due to the 19th century census, to reconstruct the size of groups of people observed in both coastal and hinterland communities with the average size of groups being 27 people.

There are, however considerable differences between the size of men's groups with figures given as 18 on the coast and four in the hinterland. Boot asserts fishing with spears on the coast would have greater return with numerous individuals whereas the act of hunting in the hinterland environment would have been more successful in smaller groups (Boot 2002: 112)

Large groups of people were observed congregating for ceremonial purposes in the hinterland during spring when starch foods provided by plants such as Macrozamia sp. were abundant (Boot 2002: 113)

3.1.2 Gathering and Hunting

Ethnographic records reference a wide range of material culture items utilised among the Yuin people. Those most frequently recorded were common in both coastal and hinterland contexts such as bark canoes, single barbed fishing spears, waddies, spear throwers, digging sticks and boomerangs. Among lithic materials the most commonly recorded items included hafted edge-ground hatchet heads. Other commonly recorded items included fish traps , bark shelters/huts, shields, clubs, clap sticks, possum skin rugs and cloaks, possum-fur belts, netted bags, plant fibre string and fibre baskets, body paint, grass tree resin cement and bone or teeth adornments (Boot 2002: 116)

Ethnohistoric literature suggests for the Yuin people fish and possums were particularly important food resources on the coast and these were available all year. Major hinterland resources were marsupials, plants and fish which were also available all year. While these may not have been staples, their availability guaranteed the possibility of occupation of both coastal and hinterland environments all year round. Ethnographic sources suggest seasonally exploited resources would have included marine mammals with observations of feasts occurring when the occasional whale was stranded (Boot 2002: 120)

Plant foods were rarely recorded by European observers, Yuin women (and sometimes men) would use digging sticks (sharpened) to dig for yams, roots and to catch smaller game. Europeans did observe the processing of the seed of Macrozamia sp. (particularly in the hinterland) from which large quantities of paste were carried wrapped in fronds of the cabbage tree palm (Livistona sp.) (Boot 2002: 123).

3.1.3 Corroboree, Ceremonial, Gatherings and Trade

The main Yuin ceremonial and religious events were a range of initiation ceremonies known collectively as Kuringal. Other gatherings included ritual combat and exchange. These have been recorded as being held in a number of different locations throughout the region. Depictions of events recorded near Nelligen and Ulladulla in 1875 portrayed a line of male and female dancers directed by two individuals. The ceremonial areas for Kuringal ceremonies sometimes contained raised earth rings while other ceremonies were conducted without them. The Kuringal ceremonies would promote strong tribal affiliations. Links between Yuin people would be further strengthened during the bartering exchanges of goods such as fish hooks, fishing spears, bark canoes and increase rites which occurred after ceremonies (Howitt 1904: 513, 518-519).

Evidence suggests the South Coast, hinterland, and nearby tablelands and alpine regions shared a social organisation where descent was patrilineal and marriage was exogamous, that is marriages within the moiety were not allowed. Other social practises include polygamous marriage by exchange of sisters, strict avoidance of mothers-in-law, local group leadership by senior men and use of ritual fights to resolve disputes and punish wrong-doers (Howitt 1904: 83, 133, 261-266, 314; Peterson 1976: 52-53; Berndt and Berndt 1974: 44).

3.1.4 Burials

There is limited information about burial customs and burial locations of the Yuin people. In addition to traditional burial places, a reserve cemetery and a burial/massacre site south-west of Kings Chair has been recorded (Boot 2002: 125). Burial practices are shared throughout the South Coast region and include burial in sheets of bark at the location of the birth place of the deceased. Most recorded burial sites occur in sand dunes or on foreshores. Burials have been marked with mounds, earth rings, fences or carved trees. The body was usually buried with the face pointing east and may have been accompanied by fishing tools, animal bones, shell ochre, spears and throwing sticks (Boot 2002:341)

3.1.5 Summary

The ethnographic information suggests the Yuin:

- Led a semi-nomadic, gatherer, hunter lifestyle
- Lived in semi-permanent camps
- Had similar cultural beliefs, shared political and social structure, and common economic strategies in both coastal and hinterland communities
- Utilised huts, canoes, fish traps, single barbed fishing spears, shields, clubs, spear throwers, clap sticks, boomerangs, hatchets, body paint, possum skin cloaks, possum fur belts, grass tree resin cement, netted bags, plant fibre string and fibre baskets in both coastal and hinterland communities
- Were able to inhabit coastal and hinterland areas all year round due to high level biodiversity and abundant resources
- Lived in average sized groups near the coast and in the hinterland however hunting parties were different sizes depending on environment
- Ceremony, corroboree and trade were an important part of traditional life
- Traded and bartered for objects such as such as fish hooks, fishing spears, bark canoes, utensils and weapons
- There is evidence of Aboriginal people being wrapped in bark and buried in dunes or on foreshores usually facing east and in the area where they were born
- Burials have been marked with mounds, earth rings, fences or carved trees

3.2 Site Register Search

A search was conducted of the OEH Aboriginal Heritage Information Management System (AHIMS) database on 21 August 2015 for any sites that had been previously recorded within the study area or within five km of the study area. The AHIMS database listed a total of 48 sites within five km of the study area but none within the study area itself. **Table 3.1** summarises the site types listed on the AHIMS Database. The full database search has been included as **Appendix 2**. The distribution of previously recorded sites is shown in **Figure 3.1**.

Table 3.1 Aboriginal Sites/Places Listed on the AHIMS Site Database within 5km of the study area

Site Type	No.
Artefact scatter	34
Isolated find	5
Potential archaeological deposit (PAD)	5
Midden/artefact scatter	3
Midden	1
Total	48

Distribution of the sites across the landscape has been biased by the lack of archaeological survey and assessment across large portions of the AHIMS search area. It could also be a reflection of the fact works were conducted before it was legally required that Aboriginal cultural and archaeological assessment be undertaken. Therefore, while the presence of sites indicates Aboriginal use of an area, it does not follow that the lack of sites means Aboriginal people did not use an area.

Those sites that are listed on the register within five km of the study area have been identified as a result of surveys conducted for: housing subdivisions; proposed quarries; new transmission lines; academic research; and as a component of a Eurobodalla based heritage study (refer to **Section 3.3**).

The most common site type is artefact scatters. They are all low density artefact scatters with less than 56 artefacts and are most commonly found on ridge crests and ridge slopes.

The five PADs recorded on AHIMS Site Database were all recorded on spur slopes and have been subject to subsurface testing since the initial recording:

- One PAD was determined not to be a site (#58-4-1073)
- One PAD (#58-4-1069) was determined to be a part of a pre-recorded site (#58-4-0955)
- PAD (#58-4-1070) was determined to be an artefact scatter and was re-registered as (#58-4-1109)
- PAD (#58-4-1071) was determined to be an isolated find and was re-registered as (#58-4-1110)
- PAD (#58-4-1072) was determined to be an isolated find and was re-registered as (#58-4-1111)

The five isolated finds were all recorded on slopes and include the two sites that were previously recorded as PAD.

The three midden/artefact scatter sites include only three artefacts each and shell species such as Anadara (saltwater bivalves) and Saccostrea cucullata (natural rock oyster). These sites were recorded on slopes and a creek flat. There is also one midden site recorded about two km south-east of the current study area.

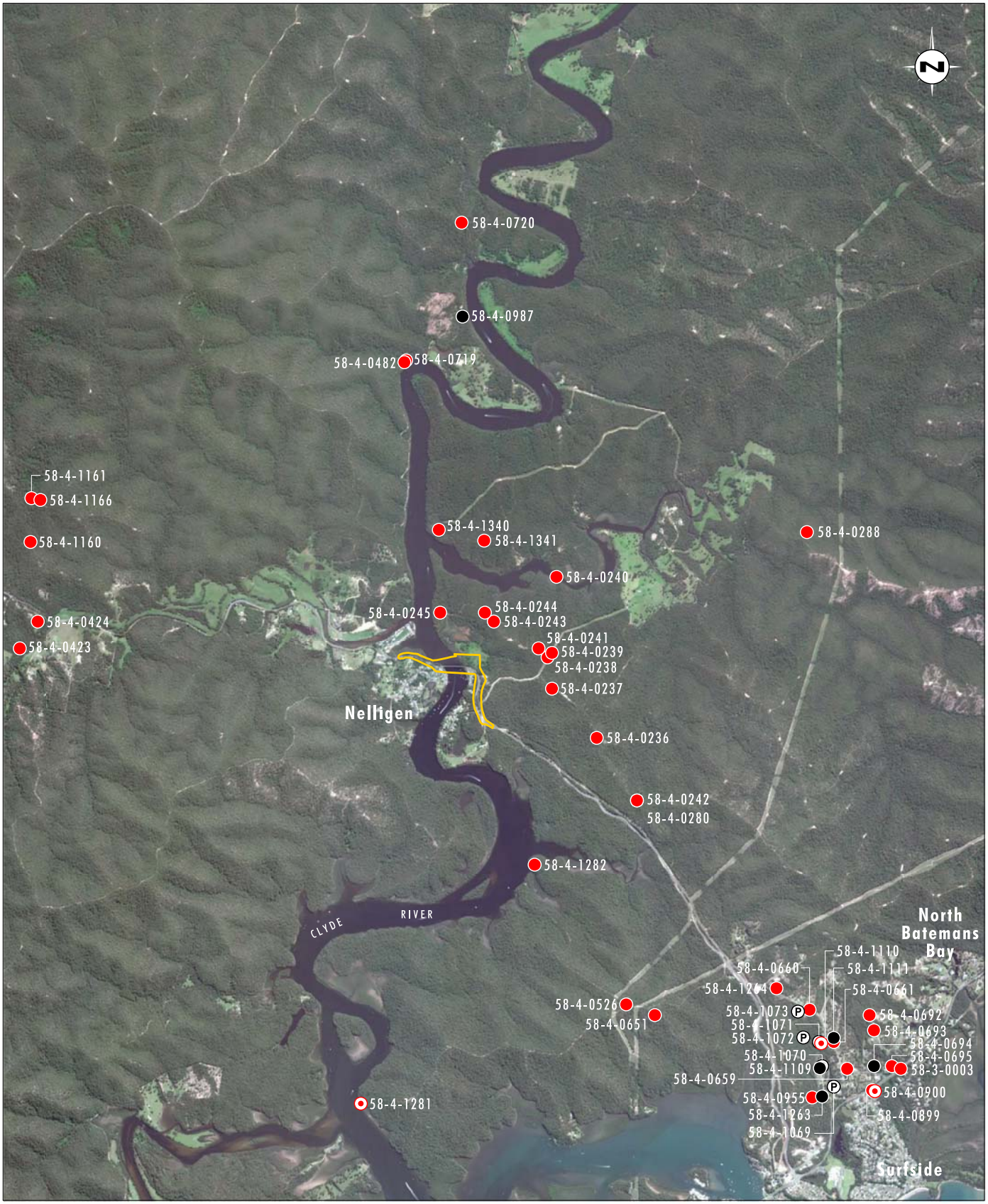

Image Source: Google Earth, DigitalGlobe (2015)
Data Source: OEH (2015)

0 1.0 2.0 3.0km
1:60 000

Legend

- Nelligen Bridge - Aboriginal Cultural Heritage Study Area
- Artefact Scatter
- Isolated Find
- Midden
- Potential Archaeological Deposit

FIGURE 3.1

Aboriginal Sites/Places Listed on the AHIMS Site Database within 5km of the Study Area

3.3 Previous Archaeological Research

As stated in **Section 3.2** the majority of the archaeological survey and assessments conducted within the Nelligen Region have been for housing subdivisions, proposed quarries, new transmission lines, academic research and as a component of a Eurobodalla based heritage study.

Previous archaeological research conducted for the Nelligen region is summarised in **Table 3.2**. Please note not all reports are available through OEH so relevant information has been summarised from other reports and available site cards. It should also be noted relevant information is not always recorded.

Table 3.2 Previous archaeological research conducted for the Nelligen region

Year	Author	Study Area	Site/PAD	Landform	Artefact Type	Raw Material	Distance and Direction From Current Study Area	Distance to water (metres)
Unknown	Nicholson	Unknown	One artefact scatter	Ridge Crest	26 artefacts	Unknown	4.2 km south-east	500
Unknown	Arncliffe	Unknown	One artefact scatter	Silt bank on edge of Clyde River	8 artefacts- Flakes, broken flakes, flaked pieces	Quartz, silcrete, fine-grained volcanic	3.5 km north.	5
Unknown	McKeown	Unknown	Two Artefact scatters	Ridge top	21 artefacts- Flakes and cores	Silcrete, fine-grained volcanic	2.6 to 4.3 km east.	500 - 1000
Unknown	D. Wood	Unknown	One artefact scatter and midden	Creek flat	3 artefacts- 1 core and two silcrete flaked pieces	Silcrete, fine-grained volcanic and shell of Anadara and Saccostrea sp.	6.6 km south-east	50
Unknown	V. Wood	Unknown	One artefact scatter	Hill slope	56 artefacts, 45 chips, 6 flaked pieces, 4 cores and 1 flake	Quartz, fine-grained volcanic and silcrete	6.6 km south-east	50

Year	Author	Study Area	Site/PAD	Landform	Artefact Type	Raw Material	Distance and Direction From Current Study Area	Distance to water (metres)
Unknown	Hall	Unknown	One artefact scatter	Ridge Top	5 artefacts- 3 flaked pieces and 2 cores	Quartz, fine-grained volcanic and silcrete	6.7 km south-east	50 - 100
Unknown	State Forests of NSW	Unknown	Three artefact scatters	Ridge crest	Flakes	Unknown	4.9 km north-west	1000 - 1200
1988	Hackwell	Archaeological survey of a housing subdivision at Nelligen, South Coast, NSW	Two artefact scatters	Ridge	Unknown	Silcrete, fine-grained volcanic	About 4.6 km west	100 -200
1989	Kuskie	Archaeological investigations of the Nelligen Run, Potato Point & Dwyer's Creek Quarries on the South Coast of NSW	10 artefact scatters	Upper ridge slope, ridge crest, creek terrace, saddle, basal slope, simple slope,	33 artefacts- Flakes, broken flakes, flaked pieces, cores and blades	Quartz, silcrete, fine-grained volcanic, porphyry	About 600 metres north to 2.5 km south-east	0 - 220

Year	Author	Study Area	Site/PAD	Landform	Artefact Type	Raw Material	Distance and Direction From Current Study Area	Distance to water (metres)
1992	Paton	An Archaeological investigation of the proposed Ulladulla to Moruya 132Kv Transmission Line	One artefact scatter	Northern slope of ridge	4 artefacts- 3 flakes and 1 core	Quartz and silcrete	4.5 km south-east	300 - 350
1992	Williams	Report on the archaeological survey of a proposed subdivision of Lots 22, 23, 24, DP1068, Clyde Road, Batemans Bay.	Four artefact scatters	Ridge Top	22 artefacts and some shell	Unknown	5.9 km south-east	100 - 150
1995	Kuskie	An Archaeological Assessment of Lot 8 DP 837396 at North Batemans Bay, South Coast NSW	Three artefact scatters, one isolated find	Ridge crest, ridge, basal slope simple slope	19 artefacts- Flakes, broken flakes, flaked pieces, cores and a hammerstone	Quartz, silcrete, fine-grained volcanic, porphyry	6.7 km south-east	15 - 300

Year	Author	Study Area	Site/PAD	Landform	Artefact Type	Raw Material	Distance and Direction From Current Study Area	Distance to water (metres)
2002	Saunders	Lot 1 DP 1015889 and Lot 2 DP 865527, Kings Highway, North Batemans Bay, NSW. Archaeological Survey.	One artefact scatter, one artefact scatter and midden, three isolated finds	Basal slope, basal spur slope, mid spur slope	36 artefacts- Flakes, flaked pieces, cores and blades	Quartz, fine-grained volcanic, silcrete and chert	About 6.5 km south-east	50 - 120
2002	Boot	Didthul, Bhundoo, Gulaga and Wadbilliga: An Archaeological Study of the Aboriginals of the New South Wales South Coast Hinterland.	Two artefact scatters and one isolated find	Slope, low terrace and saddle on north-west/south-east ridge	10 artefacts- Flaked pieces, core, flakes, broken flakes, clay hearths	Porphyry, rhyolite, silcrete	About 3.4 to 5 km north	20 -250

Year	Author	Study Area	Site/PAD	Landform	Artefact Type	Raw Material	Distance and Direction From Current Study Area	Distance to water (metres)
2004	Saunders/ McGregor	Lot 10 DP1015889 & Lot 2 DP865527, Kings Highway, North Batemans Bay: Archaeological Investigation of Six PAD's	Five PAD	lower spur slope, basal spur slope, mid spur slope	8 artefacts including flakes and a hammerstone	Quartz, fine-grained volcanic and silcrete	About 6.6 to 5.2 km south-east	50 - 120
2009	Carriage	Clyde River National PARK: Aboriginal Sites Inspection	One Midden and one midden and artefact scatter	Unknown	Unknown	Unknown	4.9 to 2.4 km to the south	Unknown (near the Clyde River – uncertain distance to fresh water)

Year	Author	Study Area	Site/PAD	Landform	Artefact Type	Raw Material	Distance and Direction From Current Study Area	Distance to water (metres)
2014	Dibden	Lot 6 DP 263081 Windywoppa Road, Benandarah, via Batemans Bay NSW. Aboriginal Cultural Heritage Assessment Report	Two artefact scatters	Spur crest	38 artefacts- Cores, flakes and broken flakes	Silcrete, quartzite, sandstone, chert, quartz and fine-grained volcanic	1.5 km to the north	Unknown (near the Clyde River – uncertain distance to fresh water)

3.4 Summary

A summary is provided below of the archaeological context for the study area.

- The majority of the sites recorded locally are low density artefact scatters
- Isolated finds and PADs are the next most common site type recorded within five km of the study area
- Middens with low density artefact scatters and a midden have also been recorded within five km of the study area
- Sites are more commonly recorded in association with ridges, ridge crests and ridge slopes
- Sites are also recorded on creek flats, creek terraces, spurs, saddles and slopes
- The most common artefact type is flake; but broken flakes, flaked pieces, chips[1], hammerstones, cores (including blade, bipolar and fragments), flaked pieces, manuports and a broken blade have been recorded
- Raw materials recorded include quartz, silcrete, chert, volcanic, quartzite, fine grained volcanic, acid volcanic, porphyry, rhyolite and sandstone
- There is not a single dominant raw material however quartz, volcanic and silcrete are most commonly used.

[1] Although this term is not commonly or widely used today it has been used commonly during site recordings in this area.

4.0 Environmental Context

The decisions people make regarding where they live, the range of resources they use and other aspects of daily life may all be influenced by the environment in which they live. The likelihood of sites being preserved and visible is also affected by environmental factors such as vegetation, past land use and disturbance. A review of the environmental context of the study area is therefore integral to developing a model with which to predict the likelihood of Aboriginal archaeological sites being present and preserved within the study area.

4.1 Geology and Soils

The Eurobodalla Shire occurs primarily within two sub-regions (Bateman and South East Corner Coastal Ranges) as identified in the "*Interim Biogeographic Regionalisation for Australia (IBRA) (version 7)*". Both of these sub-regions contain Palaeozoic (Ordovician and Silurian) metamorphic rocks with intrusions of granite and acid volcanics, particularly in the South East Corner Coastal Ranges. The western margin of Bateman and surrounding areas of South East Corner Coastal Ranges is folded Devonian sandstone, siltstone, and shales with limited areas of Tertiary basalt and quartz sands. The main valley floors and estuaries contain Quaternary alluvium in Bateman and Quaternary coastal sediments with small areas of alluvium in South East Corner Coastal Ranges (Morgan, 2001) (NPWS 2003).

Soils of the South East Corner Coastal Ranges include acid brown earths and acid red duplex soils, while the soils of Bateman are brown friable earths. The soils are mostly texture contrast soils, which are coarser in the South East Corner Coastal Ranges. Subsoils are red and yellow clays with thin topsoil on metamorphic rocks and coarser deeper grained profiles on granite. In Bateman, red brown structured loams occur on basalt. In South East Corner Coastal Ranges, deep coarse sands occur in granite derived alluvium in the flats with peaty sands in lagoons and swamps. In both subregions, deep siliceous sands occur in Tertiary sands and coastal dunes (Morgan, 2001) (NPWS 2003).

4.2 Hydrology and Topography

The South East Corner Bioregion (which contains both Bateman and South East Corner Coastal Ranges subregions) covers the eastern fall of the Great Dividing Ranges to the coast, with the north-south Great Escarpment forming the most prominent feature of it. The topography runs from the plateau above the escarpment across steep hills and gorges towards the coast, where undulating low hills dominate. Differing rates of erosion affect the local topography, forming basins in some areas and outcrops and rounded tors in others. The altitude reaches 750 metres above sea level in South East Corner Coastal Ranges, and is generally less than 250 metres above sea level in Bateman (Morgan, 2001) (NPWS 2003).

Most streams have their headwaters at the escarpment, with the resulting erosion heavily influencing the topography of the coastal side ranges. Some streams have their headwaters on the plateau, running parallel to the coast until they reach a gorge where they cross the escarpment. More detailed patterns of stream direction relate to smaller joints and faults in the bedrock. Both dendritic and rectangular drainage patters are present. The streams are generally short and active. Streams in the deep gorges often contain rapids and waterfalls carrying large volumes of sand to the valley floors and estuaries (Morgan, 2001) (NPWS 2003).

The study area spans the Clyde River at Nelligen and includes part of the river channel, floodplain and the terraces of the Clyde River, as well as part of the adjoining hills, ridges and moderate slopes of the Clyde Valley and Budawang Range (NSW Government 2002). The portion of the study area located in the Clyde River could have been subject to one in 100 year flood events however it is possible the landform could retain evidence of Aboriginal occupation that has been buried by flood events and not been destroyed by flood events or river channel migration

The Clyde River is estuarine at Nelligen and would have provided abundant resources for Aboriginal people camping in the area. There is a minor creek to the east of the Clyde River and north of the Kings Highway which would have supplied freshwater for Aboriginal people.

It is noted elevated alluvial deposits/ridges and floodplains along major waterways have been recorded as favoured by Aboriginal people for burials because it was easier to dig in sand than clay (Hope and Littleton 1995a, 1995b).

4.3 Previous Land Use

The Eurobodalla Shire's main population and commercial centres occur at Batemans Bay, Moruya, and Narooma. The remainder of the Shire is predominantly National Parks, state forests, and community lands, with a little less than a quarter being private rural land (RMCG 2014).

European contact in the area occurred in the early 1800s, with permanent settlement becoming widespread by the 1830s and 1840s marking the advent of the cattle and sheep pastoral industry in the region. After a slow start, the pastoral industry was surpassed by the dairy industry, which continues in many areas, particularly around the Bega plains, to this day. In addition to this, pig farming and maize and sorghum production also form important agricultural industries in the area (NPWS 2003). In recent times, there has been an increase in private forestry, rural lifestyle landholders and horticultural uses in the area (RMCG 2014).

Around the same time as the start of pastoral activity, fishing industries were set up along the coast, and the 1830s also saw the development of a significant whaling industry in Twofold Bay near Eden, which continued until the 1920s (NPWS 2003).

Mining for gold, silver, and arsenic occurred in the wooded areas between Batemans Bay and Eden from 1852. This mining, particularly for gold, occurred up until very recently, and formed the basis for many of the towns in the region. Forestry occurred since the 1800s to support the development of the surrounding industries (NPWS 2003). Today forestry predominantly occurs on public land and is considered to be a primary land use in the Eurobodalla Shire (RMCG, 2014).

Nelligen was first charted in 1821 by Lieutenant Robert Johnston, with mapping continuing throughout the mid 1820s. In 1829 Robert Hoddle laid out 640 acres of land at 'Nellican Creek' for an absentee landowner, and soon after other early settlers became attracted by the good timber and boat access to the area (Giovanelli 2011).

The need for access between the coast and Southern Tablelands for transporting goods was highlighted as early as 1835, however work did not begin on a road until 1853. At this time, a workman's camp was started at Nelligen, with the town formally being established in December of 1854. In 1856 The Clyde Mountain Road between Braidwood and Nelligen was opened (Giovanelli 2011).

Up until this point, timber felling was the primary production occurring at Nelligen, however with the opening of the Clyde Mountain Road, regular steamship services started and supplies to and from Braidwood and the surrounding areas were loaded at Nelligen for transport to Sydney and beyond. The population swelled. A ferry service across the Clyde was started in 1878 allowing a shorter route to Batemans Bay for travellers (Giovanelli 2011).

By the 1870s the goldfields began to wane, despite a small local rush in 1894, and Nelligen's trade and growth dropped and businesses started to close. After this, commerce changed and now centred on sawmilling, oystering, and wattlebark processing. Dairy farming in the region also began to increase, with the Clyde River Dairy Farmer Co-operative cheese factory built in 1905. By 1915 Nelligen's principal local production was timber, butter, cheese, maize, pigs, poultry, wattlebark, and gold. Steamship transport steadily began to wane as Bateman's Bay increasingly became the commercial hub of the region (Giovanelli 2011).

By 1954 the ferry was carrying some 7,500 vehicles per year across the Clyde at Nelligen. This number increased to over 30,000 by 1963, causing extensive queues at peak seasons and signalling the need for a bridge. The ensuing Nelligen Bridge was opened in December 1964 (Giovanelli 2011).

4.4 Flora and Fauna

The vegetation in the Eurobodalla Shire reflects the diversity in topography, rainfall, and temperature.

Coastal heathlands occur on shallow soils with high salt spray and frequent fire and are dominated by *Hakea* spp*.*, *Melaleuca* spp*.*, coastal rosemary (*Westringia fruticosa*), and dwarfed red bloodwood (*Corymbia gummifera*). Coastal dunes are similar to others along the NSW coast with an inland forest of various *Banksia* spp., bangalay (*E. botryoides*) and blackbutt (*E. pilularis*).

Mangrove estuarine forest occurs along the Clyde River in many locations. Mangrove estuarine forest is dominated by River Mangrove (*Aegiceras corniculatus*) and Grey Mangrove (*Avicennia marina*).

Further inland, vegetation is markedly altitudinal. Dwarfed red bloodwood and spotted gum (*Eucalyptus maculata*) forest occupy lower elevations, with yellow stringybark (*E. muellerana*), grey ironbark (*E. paniculata*), and woollybutt (*E. longifolia*) associations with brown barrel (*E. fastigata*), blue-leaved stringybark (*E. agglomerata*), messmate (*E. obliqua*) and monkey gum (*E. cypellocarpa*) occurring between 200 and 900 metres above sea level. Above this, narrow-leaved peppermint (*E. radiata*) and snow gum (*E. pauciflora*) dominate.

Latitudinal differences also occur with Sydney peppermint (*E. piperita*), large-fruited red mahogany (*E. pellita*), Sydney blue gum (*E. saligna*) and spotted gum being found in the northern part of the region. Blue box (*E. bauerana*), bangalay (*E. botryoides*), coastal grey box (*E. bosistoana*) and woollybutt are found further to the south. Granite areas commonly support forest red gum (*E. tereticornis*) and blue gum (*E. globulus*), while black ash (*E. sieberi*) can be found in almost all forest environments.

Further south, in the South East Corner Coastal Ranges, the vegetation of the steep slopes differs greatly, with white box (*E. albens*), black cypress pine (*Callitris endlicheri*), and scattered kurrajong (*Brachychiton populneum*) occurring. The tops of these slopes also support rare Acacia dry scrub communities dominated by *Acacia silvestris* and *Eriostemon trachyphyllus*. Estuaries support small areas of stunted mangrove (*Avicennia marina*) and salt marsh, with a fringe of swamp oak (*Casuarina glauca*).

Small patches of temperate rainforest with sassafras (*Doryphora sassafras*) and lilly pilly (*Acmena smithii*) occur along major streams and in sheltered locations. River oak (*Casuarina cunninghamiana*) is also present along most streams.

The area supports 15 endangered ecological communities, 11 threatened fauna species, and 98 threatened flora species. Key threats to these and all remaining native vegetation include loss and degradation of remnant vegetation, invasive plants and animals, loss and degradation of habitat, climate variability, and urban development (RMCG, 2014).

Given the diversity in vegetation and landforms, fauna in the Eurobodalla is also quite diverse. Of note, there are least 16 frog species, 18 reptile species, 199 bird species, 24 mammal species, and 16 bat species (Crowley, 2005).

Within the study area, the vegetation consists of estuarine and wetland communities such as estuarine saltmarsh, floodplain swamp forest, estuarine fringe forest, estuarine mangrove forest, and seagrass meadows; forest communities such as southeast lowland grassy woodland, south coast river flat forest, and Batemans Bay cycad forest; and shrubland (Data provided by Roads and Maritime in Data Package 20140130).

This includes two *Environment Protection and Biodiversity Conservation Act 1999* (Commonwealth) (EPBC Act) listed threatened ecological communities: 'Subtropical and Temperate Coastal Saltmarsh' (vulnerable) and 'Lowland Grassy Woodland in the South East Corner Bioregion' (critically endangered). Both of these communities are also listed under the NSW *Threatened Species Conservation Act 1995* (TSC Act) as endangered (Data provided by Roads and Maritime in Data Package 20140130).

A number of migratory bird species have also been recorded within and near the study area. White-bellied sea-eagle (*Haliaeetus leucogaster*) was the only record within the study area, however eastern great egret (*Ardea modesta*), black-faced monarch (*Monarcha melanopsis*), and satin flycatcher (*Myiagra cyanoleuca*) have been recorded within five km of the study area (Data provided by Roads and Maritime in Data Package 20140130).

There is one record of koala (*Phascolarctos cinereus*) within the study area (EPBC and TSC vulnerable species) and six nearby records of greater glider (*Petauroides volans*) (TSC endangered population). There is no threatened flora within the study area, however there are three records of chef's cap correa (*Correa baeuerlenii*) (EPBC and TSC vulnerable species) nearby (Data provided by Roads and Maritime in Data Package 20140130).

4.5 Aboriginal Resources

4.5.1 Flora

Table 4.1 provides a list of plants that are likely to have occurred within the broader Eurobodalla region and would have been used for food, medicinal or technological purposes by Aboriginal people before European Settlement.

Table 4.1 Aboriginal Resource Plants Most Likely to have occurred within the study area

Common Name and *Scientific Name*	Purpose	Reference
Apple berries *Billardiera* spp.	Food: The ripe fruits were eaten raw; the unripe fruits were roasted then eaten.	Low 1991: 124 Isaacs 1987: 218
Australian blackthorn *Bursaria spinosa*	Food: Nectar is sucked out of flowers.	Isaacs 1987: 219
Australian bugle *Ajuga australis*	Medicinal: Bruised and soaked leaves used in some areas to bathe sores and boils.	Hiddins 2003: 14 Isaacs 1987: 231
Banksias *Banksia spp.*	Food: Nectar from the blossoms provided sugary food, and was sucked from the flower.	Low 1991: 141 Isaacs 1987: 218
Blackwood *Acacia melanoxylon*	Technology: Bark.	Boot 2002:118
Blady grass *Imperata cylindrica*	Medicinal: Sharp, unfolded leaves used to cause sneezing by tickling the nose. Technology: The leaves were used to thatch huts and weave dillies.	Low 1991: 114 Isaacs 1987: 237
Blushing bindweed *Convolvulus angustissimus*	Food: Roots eaten cooked and kneaded to make dough. Medicinal: Decoction used to treat diarrhoea, indigestion, and stomach pain.	Isaacs 1987: 220, 234
Bottlebrush *Callistemon spp.*	Food: Flowers sucked for nectar.	Isaacs 1987: 219
Bracken *Pteridium esculentum*	Food: The rhizomes were roasted and eaten, sometimes as a paste. Black skin peeled off and eaten with meat. Medicinal: The sap from the stems of young ferns was used to treat insect bites.	Low 1991: 115 Isaacs 1987: 228

Common Name and *Scientific Name*	Purpose	Reference
Bulbine lily *Bulbine bulbosa*	Food: The bland starchy tubers were harvested.	Low 1991: 103 Isaacs 1987: 219
Bulrush *Typha* spp.	Food: Rhizomes roasted and steamed. After skin removed, the fibres were chewed until the starch was gone. Yong shoots were pulled and eaten raw. Technology: Leftover fibres from the rhizomes were spun into a tough string.	Low 1991: 54 Isaacs 1987: 229
Cabbage tree palm *Livistona australis*	Food: Vegetable food, young shoots and leaves eaten raw.	Isaacs 1987: 225
Caustic Weed *Chamaesyce drummondii*	Medicinal: Whole plant boiled and liquid applied for scabies or pains in the chest. Sometimes the latex used to treat sore eyes, and the juice for venereal infection and genital sores.	Isaacs 1987: 236
Chocolate lilies *Dichopogon stictus; D. fimbriatus*	Food: The juicy, slightly bitter tubers were eaten.	Low 1991: 105 Isaacs 1987: 218
Common fringed lily *Thysanotus tuberosus*	Food: The crisp, juicy, almost flavourless tubers and the base of stems were eaten.	Low 1991: 106 Isaacs 1987: 229
Cranberry heath *Astroloma humifusum*	Food: Apple tasting fruits were eaten.	Low 1991: 132 Isaacs 1987: 218
Cycads CYCADACEAE and ZAMIACEAE (families)	Food: Seeds were leached of their toxins by being soaked in water for days or weeks. The starchy kernels were cracked or crushed, sometimes cooked first, the fragments ground to paste, and then cooked. Surplus seeds could be preserved by being ground and fermented in water.	Low 1991: 138-139 Isaacs 1987: 220
Devil's twines *Cassytha* spp.	Food: The small fruits are edible, and used as snack foods. Technology: The stems were sometimes used as twine.	Low 1991: 125 Isaacs 1987: 219

Common Name and *Scientific Name*	Purpose	Reference
Early Nancy *Wurmbea* spp.	Food: The tiny rounded tubers of some species were eaten; however most seem unpalatable, including the common *W. dioica*.	Low 1991: 101 Isaacs 1987: 218
Eucalyptus *Eucalyptus* spp.	Food: Some species roots tapped for water. Medicinal: Leaves burnt and smoke used to treat fevers.	Isaacs 1987: 223, 235
Fig *Ficus coronata; F. obliqua; F. rubiginosa*	Food: The fruit was eaten raw. Technology: The rough leaves were used as sandpaper.	Hiddins 2003: 105 Isaacs 1987: 224
Flax lilies *Dianella* spp.	Food: Berries eaten (except D. tasmanica). Edible species include D. caerulea, D. longifolia, D. revoluta, D. pavopennacea and D. bambusifolia. Roots are also edible. Technology: Tough leaves of flax lilies used to weave dillies and baskets.	Low 1991: 113 Isaacs 1987: 220
Geebungs *Persoonia* spp.	Food: Fruits were eaten raw. Fruits ripen on the ground and are best when soft. The skin is discarded and the soft pulp around the seed is consumed. Medicinal: An infusion of the bark and leaves was used to relieve sore throats and colds. A concoction of inner bark and water used to relieve sore eyes. Technology: Fishing lines made from the bark of E. Agglomerate. They were strengthened by soaking the bark in water.	Low 1991: 134 Hiddins 2003: 77 Isaacs 1987: 226
Golden stars *Hypoxis pratensis; H. hygrometrica; H. nervosa*	Food: The roasted tubers of these species were eaten. The other species are irritants and inedible.	Low 1991: 103 Isaacs 1987: 224
Grasstrees *Xanthorrhoea spp.*	Food: The starch, nectar, shoots, and leaf bases are all edible and all eaten raw. The flower heads were also sometimes soaked in coolamons to make sweet drinks. Technology: The gum served as glue; flower stalks were made into firesticks and spear handles; the resin was used as a fire starter; and the dead trunks served as fire wood, burning hot even when wet.	Low 1991: 140 Hiddins 2003: 80 Isaacs 1987: 229

Common Name and *Scientific Name*	Purpose	Reference
Grevillea *Grevillea* **spp.**	Food: Nectar sucked from flowers.	Isaacs 1987: 224
Ground orchids ORCHIDACEAE (family)	Food: Starchy tubers eaten either roasted or raw. Epiphytic tree orchids such as Dendrobium speciosum have thickened stems, which were chewed or sucked for their starch.	Low 1991: 108 Isaacs 1987: 224, 226
Grey Box *Eucalyptus* bosistoana	Technology: Bark.	Boot 2002:118
Headache vine *Clematis glycinoides*	Medicinal: The odour used to treat headaches.	Isaacs 1987: 234
Hovea *Hovea* **spp.**	Food: Young pods eaten.	Isaacs 1987: 224
Indigo *Indigofera* **spp.**	Medicinal: Roots hammered and placed in fresh or salt water as a fish poison.	Isaacs 1987: 237
Kangaroo apples *Solanum* spp.	Food: The soft sickly sweet berries were eaten either roasted or raw.	Low 1991: 133 Isaacs 1987: 228
Kangaroo grass *Themeda triandra*	Food: Seeds ground and baked.	Isaacs 1987: 229
Kurrajong *Brachychiton populneus*	Technology: Bark.	Boot 2002:118
Lance beard heath *Leucopogon lanceolatus*	Food: Fruits were eaten.	Low 1991: 130

Common Name and *Scientific Name*	Purpose	Reference
Lawyer vine *Smilax australis*	Medicinal: Extract used to treat sore eyes.	Isaacs 1987: 239
Lillypilly *Syzygium smithii*	Food: The fruits were widely eaten.	Isaacs 1987: 217
Long-leaf mat-rush *Lomandra longifolia*	Food: The white inner leaf bases and seeds were eaten raw. Technology: The tough leaves were split into strips and woven into dillies and mats.	Low 1991: 118 Isaacs 1987: 225
Messmate *Eucalyptus* obliqua.	Technology: Bark.	Boot 2002:118
Milkmaids *Burchardia umbellata*	Food: The crisp juicy tubers eaten	Low 1991: 101
Mistletoes Loranthacae and Visaceae (families)	Food: The fruits of many species were eaten as a snack. Mainly Amyema and Lysiana species.	Low 1991: 126 Isaacs 1987: 218
Mountain she-oak *Allocasuarina verticillata*	Food: Leaves and young cones chewed raw when thirsty	Isaacs 1987: 217
Nardoo *Marsilea drummondii*	Food: In some areas, the seeds would be collected and ground into flour.	Hiddins 2003: 2
Native cherry *Exocarpos cupressiformis*	Food: The fruits were eaten. Technology: wood.	Low 1991: 137 Isaacs 1987: 223
Native grape *Cissus hypoglauca*	Food: The grapes eaten raw. Vines used as a water source.	Hiddins 2003: 138 Isaacs 1987: 220

Common Name and *Scientific Name*	Purpose	Reference
Native plantain *Plantago* spp.	Medicinal: After heavy rains the seeds swell into balls of jelly (mucilage) which was used as a cure for constipation	Low 1991: 97
Native sarsaparilla *Smilax glyciphylla*	Medicinal: Leaf infusion used as general tonic and remedy and to treat coughs and chest troubles. Also a good source of vitamin C.	Isaacs 1987: 239
Pale-fruit ballart *Exocarpos strictus*	Food: The fruits were eaten.	Low 1991: 137
Pale grass lily *Caesia calliantha; C. parviflora*	Food: The roots of both species were eaten.	Low 1991: 102
Paperbark *Melaleuca* **spp.**	Medicinal: Leaf oils used in treatment of colds. The flexible bark used as bandages.	Isaacs 1987: 237
Pigface *Carpobrotus* spp.	Food: The fruits were eaten and the salty leaves were sometimes used in place of salt with meat. Medicinal: Juice used to treat sandfly bites, and a poultice of crushed leaves used on burns and scalds.	Low 1991: 30 Hiddins 2003: 16
Pink-flowered native raspberry *Rubus parvifolius*	Food: The fruits were eaten. Medicinal: Decoction of young leaves used to treat 'bad' belly.	Low 1991: 127 Isaacs 1987: 228, 238
Prickly broom heath *Monotoca scoparia*	Food: Fruits were eaten.	Low 1991: 129
Red ash *Alphitonia excelsa*	Medicinal: Young leaf tips chewed for upset stomach and decoction of bark and wood used for muscle pains and toothaches.	Isaacs 1987: 231

Common Name and *Scientific Name*	Purpose	Reference
Rounded noon-flower *Disphyma crassifolium subsp. clavellatum*	Food: Fleshy leaves eaten raw or baked.	Isaacs 1987: 220
Sallee *Eucalyptus* stellulata.	Technology: wood.	Boot 2002:118
Saw-sedge *Gahnia aspera*	Food: The seeds were pounded and ground to form flour that was used to make damper.	Hiddins 2003: 11
Sedge **Carex sp.**	Food: The flower stems were eaten.	Boot 2002:118
Sour currant-bush *Leptomeria acida*	Food: The fruits were eaten.	Low 1991: 135
Stinging nettle *Urtica incisa*	Medicinal: Leaves used to cause a nettle rash in areas suffering from rheumatism. For sprains, an infusion was used to bathe affected part. Boiled leaves also used as a poultice.	Isaacs 1987: 240
Stringybark *Eucalyptus* muellerana.	Technology: Bark and wood.	Boot 2002:118
Tall spike rush *Eleocharis sphacelata*	Food: The starch in the young underground stems eaten.	Low 1991: 53 Isaacs 1987: 220
Tree fern *Cyathea* **spp. and** *Dicksonia* **spp.**	Food: The upper trunk contains a core of white starch which was eaten raw or roasted. The croziers were also eaten.	Low 1991: 86 Isaacs 1987: 220
Twining fringed lily *Thysanotus patersonii*	Food: The watery tubers eaten.	Low 1991: 107

Common Name and *Scientific Name*	Purpose	Reference
Vanilla lilies *Arthropodium minus; A. milleflorum*	Food: The juicy, sweetish or bitter tubers eaten.	Low 1991: 102 Isaacs 1987: 218
Water ribbons *Triglochin* spp.	Food: Bland starchy tubers were roasted, pounded and fed to teething babies and the elderly. The raw or roasted tubers were also eaten by adults, and were probably an important staple food throughout much of Australia.	Low 1991: 49
Wattles *Acacia* spp.	Food: The gum of pale species was eaten and often blended with water or nectar to make drinks. Acacia seeds are exceptionally nutritious and were also eaten. Medicinal: Inner bark soaked or boiled and liquid drunk as a cough medicine.	Low 1991: 152 Isaacs 1987: 217, 231
Wild sorghum *Sorghum leiocladum*	Food: Seeds ground and baked.	Isaacs 1987: 228
Wombat berry *Eustrephus latifolius*	Food: The burst berries contain a small amount of crisp white pulp which was eaten. The tubers were also eaten, though less often and not after dry weather.	Low 1991: 122
Yellow wood sorrel *Oxalis* spp.	Food: Sour, lemony leaves of wood sorrel were sometimes eaten by Aboriginal people. Excellent salad herb. Some tap roots dug as food, resembling a carrot and tasting like coconut.	Low 1991: 99 Isaacs 1987: 226

4.5.2 Fauna

Table 4.2 provides a list of fauna that are likely to have occurred within the broader Eurobodalla region and would have been used for food or technological purposes by Aboriginal people before European Settlement.

Table 4.2 Aboriginal Faunal Resources Most Likely to Have Occurred within the Study Area

Common Name and *Scientific Name*	Purpose	Reference
Eel *Alabes dorsalis*	Given to wife's father, food source	Howitt 1904: 756-758
Echidna *Tachyglossidae*	Hunted for its meat	Howitt 1904: 756-758
Emu *Dromaius novaehollandiae*	Cooked where killed, unless near camp, intestines, liver, gizzard eaten by hunter, rest distributed	Howitt 1904: 756-758
Fish	Part of catch shared	Howitt 1904: 756-758
Freshwater mussel *Mytilis edulis*	Eaten raw or cooked over hot ashes	Hiddins 2003: 165
Gould's goanna *Varanus gouldii*	Cooked whole over ashes or hot coals and the intestines searched for eggs	Hiddins 2003: 158
Kangaroo *Macropus sp.*	Butchered, shared amongst men and cooked before returning to camp	Howitt 1904: 756-758
Koala *Phascolarctos cinereus*	Cooked where caught or carried home raw, depending on distance, before being distributed	Howitt 1904: 756-758
Lace monitor *Varanus varius*	Shared by all in camp	Howitt 1904: 756-758

Common Name and *Scientific Name*	Purpose	Reference
Lerp scale *Psylla* spp. especially *Psylla eucalypti*, and *Glycaspis* spp.	Scraped off the leaves and eaten for a sugary hit. Also used to make drinks by mixing it with water.	Hiddins 2003: 154
Mangrove worm *Teredo spp*	Chopped from the wood and eaten raw	Issacs 1987:175
Native bee sugarbag *Tetragonula carbonaria*	Highly prized and never served with anything else the sugarbag was scooped out with the larvae and bees	Hiddins 2003: 155
Possum *Trichosurus* sp. *Pseudocheirus peregrinus* sp.	Not butchered but given away whole if more than one caught, if only one, is kept by the hunter. Skin rugs made from dried pelts.	Howitt 1904: 756-758
Shellfish	Shared food source	Howitt 1904: 756-758
Stingrays *Dasyatis* spp., *Himantura* spp	Speared and either roasted or skinned and grilled. The barb from the tail was also used as a knife or spear point	Hiddins 2003: 151
Swan *Cygnus olor*	One kept by the hunters, others distributed. Food source	Howitt 1904: 756-758
Wombat *Vombatidae*	Intestines removed, animal skewered and taken to camp for distribution	Howitt 1904: 756-758
Yabby *Cherax destructor*	Eaten cooked	Hiddins 2003: 175

4.6 Implications for the study area

- Portions of the top soil layer within the study area would have been previously disturbed/removed during the developmental history and through associated erosion
- It is likely the ridge slopes and crests could still retain spatial integrity but it is unlikely there is still stratigraphic integrity due to the previous disturbance
- It is likely the alluvial landforms within the study area would still retain spatial integrity but not stratigraphic integrity due to the sandy nature of the deposit
- The portion of the study area located on Clyde River could have been subject to one in 100 year flood events however it is possible the landform could retain evidence of Aboriginal occupation that has been buried by flood events and not been destroyed by flood events or river channel migration
- The study area is located close to the estuarine Clyde River which would have provided a diverse array of floral and faunal resources for Aboriginal people before disturbance
- There is a minor creek to the east of the Clyde River and north of the Kings Highway which would have supplied freshwater for Aboriginal people
- These resources would have enabled Aboriginal people to camp in the area in small groups for a relatively long period of time
- The alluvial landforms near the Clyde River would also have supported larger groups for shorter occupation periods
- It is likely the ridges and associated slopes with the study area would show evidence (low density artefact scatters) of travel by Aboriginal people.

5.0 Predictive Model

This section of the report provides a predictive model for site type, site location and site preservation within the study area. The predictive model is based on the Aboriginal cultural, ethnographic and archaeological context (refer to **Section 3.0**) and the environmental context (refer to **Section 4.0**) of the study area. This information is used to inform the survey methodology and significance assessment process. Please note (for the purpose of this predictive model, survey and assessment) a potential archaeological deposit (PAD) is defined as deposits that have the potential to retain either stratigraphic or spatial integrity. They are not simply areas that can be predicted to have subsurface artefacts (though the term is often used in this manner).

The following is predicted:

- Low density and complexity artefact assemblages may occur within the subsurface context on the ridge and ridge slopes
- PADs are most likely to be recorded on spur slopes
- Isolated finds would most likely be found on the slopes throughout the study area
- Stone artefacts are most likely to be flakes manufactured from silcrete and volcanic material but may include; cores (including bipolar), broken flakes, flaked pieces, hammerstones, blades and broken blades; produced from quartz, chert, quartzite, sandstone or porphyry
- Middens could be found in close proximity of the Clyde River on slopes and flats
- Burial sites could occur in the foreshore of the Clyde River
- Previous disturbance and development of the study area is most likely to have disturbed the top layers of the natural ground surface and resulted in erosion but deposits below this disturbance/erosion could potentially contain sites retaining some archaeological integrity.

6.0 Sampling Strategy

All areas of proposed impact including those designated as possible locations for temporary stockpiles, compound sites and sediment basins have been inspected wherever feasible. A survey has been undertaken of all landforms including:

- Ridge Crest
- Ridge Slope
- Alluvial landform
- Riverbank
- Previously modified areas

The survey coverage has been limited by:

- Workplace Health and Safety (close proximity to existing roads and existing cuts)
- The ability to transverse the landscape due to existing cuts.

For example the southern side of the Kings Highway to the west of the Clyde River within the study area will not be surveyed due to the existing cut, limited road reserve to traverse and high levels of previous disturbance.

7.0 Survey Methodology

The inspection of the study area was conducted on foot. Photographs were taken of the study area with location data recorded using a hand-held GPS and compass. Information recorded during the survey included:

- Landform
- Vegetation
- Aboriginal resources
- Aspect
- Gradient
- Outlook
- Soil description
- Soils aggrading/degrading/stable
- Geology
- Extent of exposures
- Visibility
- Distance to nearest watercourse/permanence of watercourse
- The effects of previous land use and disturbance
- Any sites or PAD within the study area and
- Any information provided by the key Aboriginal stakeholder about the cultural significance or values of the area.

8.0 Survey Results

The inspection was undertaken with a representative from the BBLALC on 7 October 2015 (refer to **Section 1.3**). The inspection was conducted in warm overcast conditions.

The survey results are summarised by transect in **Table 8.1** and in **Sections 8.1 to 8.13**. Refer to **Figure 8.1** for the location of each transect within the study area.

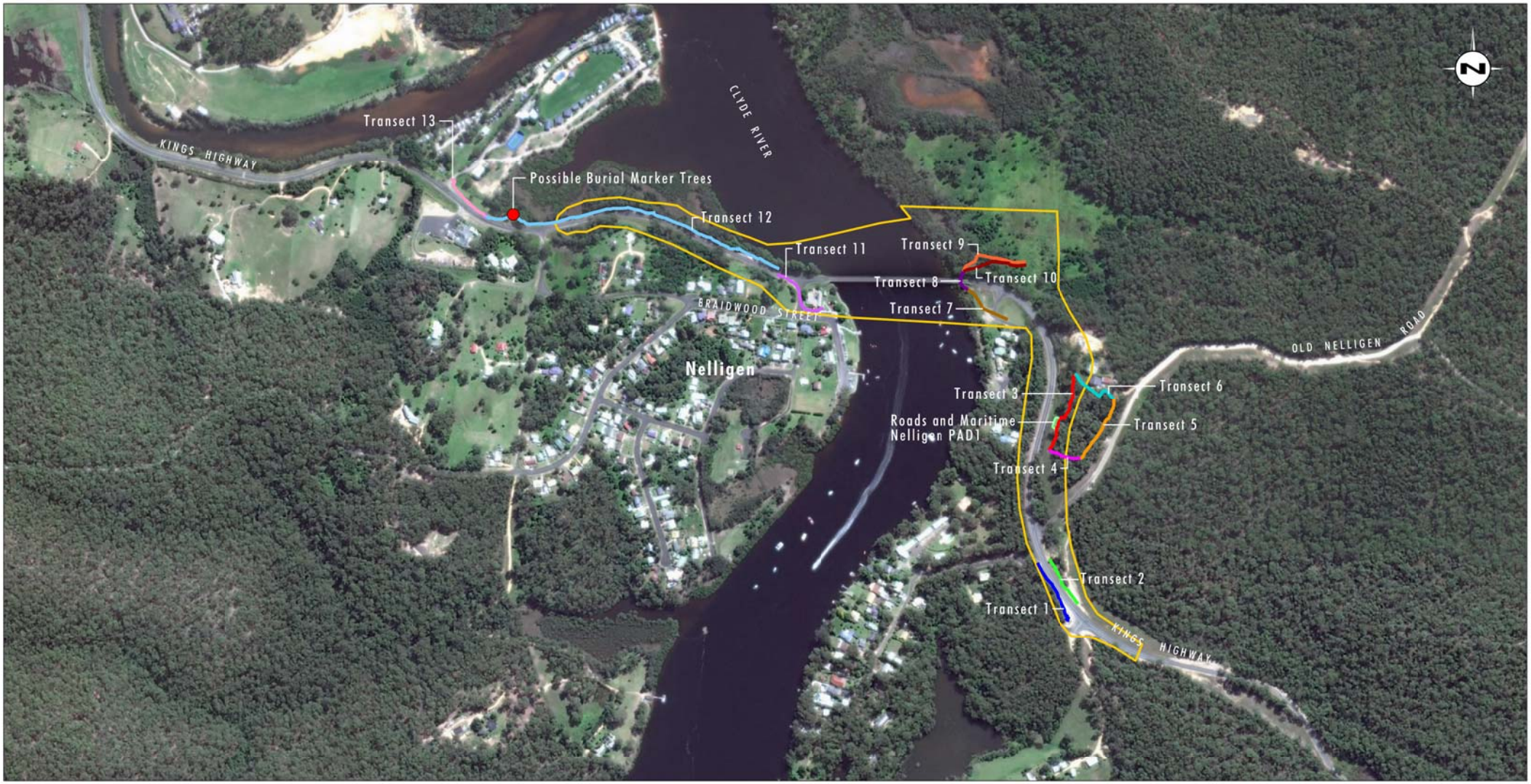

Image Source: Google Earth, DigitalGlobe (2015)
Data Source: NSW Roads and Maritime (2015)

0 100 250 500m
1:10 000

Legend

- Nelligen Bridge - Aboriginal Cultural Heritage Study Area
- Roads and Maritime Nelligen PAD1
- Transect 1
- Transect 2
- Transect 3
- Transect 4
- Transect 5
- Transect 6
- Transect 7
- Transect 8
- Transect 9
- Transect 10
- Transect 11
- Transect 12
- Transect 13
- Possible Burial Marker Trees

FIGURE 8.1

Survey Coverage and Results

File Name (A4): R01/8081_001.dgn
20160210 13.18

Table 8.1 Summary of Survey Transect Results

Transect	Landform	Aspect	Gradient	Outlook	Soil Description	Geology	Area of Exposure (m2)	Visibility	Hydrology (Distance to Water metres)	Sites/and or PAD
1	Ridge Crest	WSW	Ten degrees	Heavily vegetated	Degrading Light brown sandy loam	Quartz shale	35.27	15%	305	N/A
2	Ridge Crest	NNW	Five degrees	Heavily vegetated Partially cleared	Degrading Light brown sandy loam	Quartz shale	25.31	15%	313	N/A
3	Ridge Slope	W	Three degrees	River 180 degrees	Degrading Yellow red sandy loam	Quartz shale	64.40	10%	143	Roads and Maritime Nelligen PAD1
4	Ridge Crest	W	Three degrees	River 180 degrees	Degrading Yellow red sandy loam	Quartz shale	19.22	1%	142	N/A
5	Ridge Slope	E	Four degrees	Heavily vegetated Track	Degrading Yellow red sandy loam	Quartz shale	132.63	3%	209	N/A
6	Modified	N/A	N/A	N/A	N/A	N/A	0.00	0%	157	N/A
7	Modified	N/A	N/A	N/A	N/A	N/A	0.00	0%	10	N/A
8	Riverbank	W	One degree	River 180 degrees	Degrading Grey sandy loam	Not evident	24.76	75%	6	N/A

Transect	Landform	Aspect	Gradient	Outlook	Soil Description	Geology	Area of Exposure (m2)	Visibility	Hydrology (Distance to Water metres)	Sites/and or PAD
9	Alluvial Landform	SW	Two degrees	River, ridge 270 degrees	Aggrading Creamy grey sandy loam	Quaternary Alluvium	157.36	5%	30	N/A
10	Alluvial Landform	SW	Two degrees	River, ridge 270 degrees	Aggrading Creamy grey sandy loam	Quaternary Alluvium	193.22	5%	30	N/A
11	Modified	N/A	N/A	N/A	N/A	N/A	0.00	0%	24	N/A
12	Alluvial Landform	NE	One degree	Heavily vegetated	Aggrading Creamy grey sandy loam	Quaternary Alluvium	60.04	3%	10	Possible burial marker trees
13	Modified	N/A	N/A	N/A	N/A	N/A	0.00	0%	97	N/A

8.1 Transect 1

Vegetation community:

- Batemans Bay cycad forest

Aboriginal Resources include:

- Native cherry (refer to **Table 4.1**)
- Eucalyptus (refer to **Table 4.1**)
- No raw material sources were recorded
- No sites or PAD recorded

Previous land use and disturbance includes:

- Tree clearance
- Road construction
- Road reserve

Aboriginal Stakeholder Cultural Significance or values:

- Most likely to have been a travel route from the mountains through to the coast
- Due to the previous disturbance the transect area was not considered to be of significance to the Aboriginal stakeholder

8.2 Transect 2

Vegetation community:

- Batemans Bay cycad forest
- Area has also been partially cleared

Aboriginal Resources include:

- No raw material sources were recorded
- No sites or PAD recorded

Previous land use and disturbance includes:

- Tree clearance
- Road construction
- Current laydown area

Aboriginal Stakeholder Cultural Significance or values:

- Most likely to have been a travel route from the mountains through to the coast
- Due to the previous disturbance the transect area was not considered to be of significance to the Aboriginal stakeholder

8.3 Transect 3

Vegetation community:

- Batemans Bay cycad forest

Aboriginal Resources include:

- Eucalyptus (refer to **Table 4.1**)
- Geebung (refer to **Table 4.1**)
- Long-leaf mat-rush (refer to **Table 4.1**)
- Although quartz was identified in the area it was not considered to be of suitable knapping quality
- No sites were recorded
- Roads and Maritime Nelligen PAD1 was recorded during this transect.

Previous land use and disturbance includes:

- Road cut
- Tree clearance
- Electricity easement

Aboriginal Stakeholder Cultural Significance or values:

The ridge slope landform was identified as significant to the Aboriginal stakeholder. Roads and Maritime Nelligen PAD1 was recorded in this area and was identified as having moderate Aboriginal cultural significance by the Aboriginal stakeholder. The PAD area is about 10 by 20 metres. The ridge slope landform is considered moderately significant by the Aboriginal stakeholder because:

- It is located along an identified travel route with an outlook over the Clyde River
- There are known but unrecorded artefact scatters to the east on the ridge crest
- Aboriginal resource plants were recorded in the area.

It is understood the landform has been impacted by the establishment and maintenance of an electricity easement. However, it is considered likely the soil profile would still retain integrity below this disturbance.

8.4 Transect 4

Vegetation community:

- Batemans Bay cycad forest

Aboriginal Resources include:

- Eucalyptus (refer to **Table 4.1**)
- Geebung (refer to **Table 4.1**)
- No raw material sources were recorded
- No sites or PAD recorded

Previous land use and disturbance includes:

- Tree clearance
- Road construction

Aboriginal Stakeholder Cultural Significance or values:

It is located along an identified travel route with an outlook over the Clyde River and is considered a sensitive landform. Information was provided about known but unrecorded artefact scatters to the east on the ridge crest. Aboriginal resource plants were recorded in the area. The area was not considered to be a PAD although it is within the vicinity of Roads and Maritime PAD1 because it is it is a steeper landform and different outlook. As such it was not identified as PAD from either an Aboriginal or archaeological perspective.

8.5 Transect 5

Vegetation community:

- Batemans Bay cycad forest

Aboriginal Resources include:

- No raw material sources were recorded
- No sites or PAD recorded

Previous land use and disturbance includes:

- Tree clearance
- Road construction

Aboriginal Stakeholder Cultural Significance or values:

It is located along an identified travel route and is considered a sensitive landform. The area was not considered to be a PAD although it is within the vicinity of Roads and Maritime PAD1 because of the extensive previous disturbance and different outlook. As such it was not identified as PAD from either an Aboriginal or archaeological perspective.

8.6 Transect 6

Vegetation community:

- The area has been modified and cleared for dwelling construction

Aboriginal Resources include:

- No raw material sources were recorded
- No sites or PAD recorded

Previous land use and disturbance includes:

- Tree clearance
- Dwelling construction

Aboriginal Stakeholder Cultural Significance or values:

There is no identified significance or values identified for this transect.

8.7 Transect 7

Vegetation community:

- The area has been modified and cleared
- It is now a recreation area

Aboriginal Resources include:

- No raw material sources were recorded
- No sites or PAD recorded

Previous land use and disturbance includes:

- Tree clearance
- Modified recreation area
- Road construction

Aboriginal Stakeholder Cultural Significance or values:

There is no identified significance or values identified for this transect.

8.8 Transect 8

Vegetation community:

- Partially cleared
- Estuarine mangrove forest

Aboriginal Resources include:

- No raw material sources were recorded
- No sites or PAD recorded

Previous land use and disturbance includes:

- Tree clearance
- Road construction

Aboriginal Stakeholder Cultural Significance or values:

There is no identified significance or values identified for this transect.

8.9 Transect 9

Vegetation community:

- South coast river flat forest

Aboriginal Resources include:

- Bracken (refer to **Table 4.1**)
- No raw material sources were recorded
- No sites were recorded

Previous land use and disturbance includes:

- Tree clearance
- Agriculture
- Road construction

Aboriginal Stakeholder Cultural Significance or values:

There is no identified significance or values identified for this transect.

8.10 Transect 10

Vegetation community:

- South coast river flat forest

Aboriginal Resources include:

- Bracken (refer to **Table 4.1**)
- No raw material sources were recorded
- No sites were recorded

Previous land use and disturbance includes:

- Tree clearance
- Agriculture
- Road construction

Aboriginal Stakeholder Cultural Significance or values:

There is no identified significance or values identified for this transect.

8.11 Transect 11

Vegetation community:

- This area has been modified and is now a manicured lawn and park area

Aboriginal Resources include:

- No raw material sources were recorded
- No sites or PAD recorded

Previous land use and disturbance includes:

- Tree clearance
- Road construction
- Road reserve
- Park area

Aboriginal Stakeholder Cultural Significance or values:

Due to the previous disturbance the transect area was not considered to be of significance to the Aboriginal stakeholder.

8.12 Transect 12

Vegetation community (west to east):

- Floodplain swamp forest
- Estuarine mangrove forest
- Shrubland
- Estuarine fringe forest
- Southeast lowland grassy woodland (including EPBC and TSC lowland grassy woodland)
- Estuarine saltmarsh
- River mangrove

Aboriginal Resources include:

- Mountain she-oak
- River mangrove
- Bulrush
- No raw material sources were recorded
- No sites or PAD recorded

Previous land use and disturbance includes:

- Tree clearance
- Road construction
- Road reserve

Aboriginal Stakeholder Cultural Significance or values:

Two large trees were identified as possible headstones by the BBLALC representative (Easting 240658 Northing 6051511). The Roads and Maritime representatives indicated they were not going to be impacted. The trees and any possible burial locations would be outside the project impact area and would be protected during construction.

8.13 Transect 13

Vegetation community:

- This area has been modified and is now a manicured lawn and roadside drainage

Aboriginal Resources include:

- No raw material sources were recorded
- No sites or PAD recorded

Previous land use and disturbance includes:

- Tree clearance
- Road construction
- Road reserve
- Roadside drainage

Aboriginal Stakeholder Cultural Significance or values:

Due to the previous disturbance the transect area was not considered to be of significance to the Aboriginal stakeholder

8.14 Effective Coverage

There are numerous environmental conditions that affect the detection of sites within the landscape. These have been divided into three categories defined as ground surface visibility, exposure and the background effect. Briefly, these factors relate to the amount of vegetation cover (or in this case buildings and infrastructure) that may conceal artefacts; the amount of erosion uncovering artefacts from subsurface deposits; and the presence of natural rocks and gravel which tend to obscure stone artefacts. Quantification of the extent of the influence of these factors on site detection provides an index of the survey effectiveness and hence the accuracy of the results. Effective survey coverage is determined using the total area of the landform surveyed taking into account the visibility and exposure.

The effective coverage for each transect is shown in **Table 8.2.** The visibility within the riverbank landform was very high but only a very small proportion of this landform was included in this survey. The ridge crest and ridge slope landforms generally had high visibility but low levels of exposure. The extent of the vegetation cover within the alluvial landform areas meant there weren't many areas of exposure and low levels of visibility.

Visibility was higher in those areas of ground surface disturbance associated with existing infrastructure, easements and tracks.

The total effective cover for the survey was estimated to be 0.42 per cent (refer to **Table 8.3**). An overall effective cover result of 0.42 per cent, although low, is considered to be acceptable. The total effective cover was heavily influenced by the high proportion of modified landforms within the study area which meant there were no areas of exposure or visibility recorded within those transects.

Table 8.2 Survey Coverage

Survey Unit	Landform	Survey unit area (sq m)	Exposure %	Area of Exposure (m2)	Visibility %	Effective coverage area (sq m)	Effective coverage %
Transect 1	Ridge Crest	705	5.00	35.27	15	5.29	0.75
Transect 2	Ridge Crest	506	5.00	25.31	15	3.80	0.75
Transect 3	Ridge Slope	1610	4.00	64.40	10	6.44	0.40
Transect 4	Ridge Crest	641	3.00	19.22	1	0.19	0.03
Transect 5	Ridge Slope	1326	10.00	132.63	3	3.98	0.30
Transect 6	Modified	1004	0.00	0.00	0	0.00	0.00
Transect 7	Modified	939	0.00	0.00	0	0.00	0.00
Transect 8	Riverbank	210	11.80	24.76	75	18.57	8.85
Transect 9	Alluvial Landform	1192	13.20	157.36	5	7.87	0.66
Transect 10	Alluvial Landform	1323	14.60	193.22	5	9.66	0.73
Transect 11	Modified	628	0.00	0.00	0	0.00	0.00
Transect 12	Alluvial Landform	3002	2.00	60.04	3	1.80	0.06
Transect 13	Modified	524	0.00	0.00	0	0.00	0.00
Total		**13610.53**		**712.20**		**57.60**	**0.42**

Table 8.3 Landform Summary – sampled areas

Landform	Landform area (sq m)	Area effectively surveyed (sq m)	% of landform effectively surveyed	Number of sites/PADs	Number of artefacts or features
Ridge Crest	1852.17	9.28	0.50	0	0
Ridge Slope	2936.22	10.42	0.35	1 PAD	0
Riverbank	209.81	18.57	8.85	0	0
Alluvial landform	5517.64	19.33	0.35	0	0
Modified	3094.70	0.00	0.00	0	0
Total	**13610.53**	**57.60**	**0.42**	**1 PAD**	**0**

8.15 Summary of Results

- Ground surface visibility was relatively low throughout the project except for within the riverbank landform
- The level of exposure throughout the study area was low except within the riverbank landform
- Roads and Maritime Nelligen PAD1 (refer to **Figure 8.2)** was identified within the ridge slope landform on the eastern side of the Clyde River to the east of the Kings Highway. The PAD is about 10 by 20 metres in area
- Two trees identified by the Aboriginal stakeholder as having the potential to be burial markers were identified north of the Kings Highway and west of Clyde River not within the Roads and Maritime Nelligen PAD1 area
- No sites were identified through the survey
- Aboriginal resources were found throughout the study area
- No fauna was observed throughout the survey
- No suitable raw material sources were identified during the survey.

Image Source: Google Earth, DigitalGlobe (2015)
Data Source: NSW Roads and Maritime (2015)

0 10 25 50m
1:1 000

Legend

- Nelligen Bridge - Aboriginal Cultural Heritage Study Area
- Roads and Maritime Nelligen PAD1
- Transect 3
- Transect 4
- Transect 5
- Transect 6

FIGURE 8.2

Roads and Maritime Nelligen PAD1

9.0 Test Excavation Recommendations

Section 3.1 of the *Code of Practice for Archaeological Investigation for Aboriginal Objects in New South Wales* (DECCW 2010a) (hereafter the Code of Practice) requires archaeological test excavation to be undertaken (regardless of whether there are objects present on the ground surface) if it can be demonstrated that 'sub-surface Aboriginal objects with potential conservation value have a high probability of being present in the area, and the area cannot be substantially avoided by the proposed activity' (DECCW 2010a: 24). The Code of Practice specifies that a review of the landscape context, previous archaeological work, the known local and regional character of Aboriginal land use, the predicted nature and distribution of archaeological evidence and the results of archaeological survey can be used to demonstrate this potential.

In consultation with the key Aboriginal stakeholder it is proposed to complete test excavations under the Code of Practice. The purpose of completing test excavations is to determine if there is Aboriginal archaeological material in a subsurface context within RMS Nelligen PAD1. The PAD area will be tested to determine if there are any further mitigation/salvage requirements for the project area.

10.0 Test Excavation Methodology

10.1 Project Area Impacts

The following information will outline the proposed impacts (harm) on Roads and Maritime Nelligen PAD1.

10.2 RMS Nelligen PAD1

Type of harm:

- Excavation of cut embankments
- Relocation of utilities
- Clearing of vegetation
- Landscaping/revegetation on completion of the road works.

Degree of harm:

- Total removal of PAD

Consequence of harm:

- Total loss of any archaeological material it may contain

10.3 Unknown impacts

Please note that the locations of the following impacts are not known:

- Temporary stockpile sites
- Temporary compound sites
- Temporary sediment basins

10.4 Methodology for Test Excavations

The following methodology for conducting test excavations has been developed to provide clear procedures to ensure that any archaeological material identified within the project area is appropriately documented and managed. The subsurface testing will be undertaken by two appropriately qualified archaeologists and two registered Aboriginal party representatives. It is estimated that the subsurface testing of RMS Nelligen PAD1 will take one day.

10.4.1 Selection of Test Excavation Locations

Test excavation locations will be chosen in consultation with the participating Aboriginal stakeholders and archaeologist. Test excavations will be placed in areas less likely to have been impacted by previous development (refer to **Section 4.3** for information relating to previous land use of the project area).

When choosing test excavation locations the following must be taken into account:

- Test excavation units must be placed on a systematic grid appropriate to the scale of the area being investigated
- Any test excavation point must be separated by at least 5 metres
- Test excavations must be excavated in 50 cm x 50 cm units
- Test excavations units may be combined and excavated as necessary to understand the site characteristics, however:
    - The maximum continuous surface area of a combination of test excavation units at any single excavation point conducted in accordance with point 1 (above) must be no greater than 3 m^2
    - The maximum surface area of all test excavation units must be no greater than 0.5 per cent of the area being investigated.

The following test excavations area proposed for RMS Nelligen PAD1:

- Any combination of 50 cm x 50 cm units up to 1 m^2.

10.4.2 General Excavation Methodology

Test excavations will be undertaken manually and in accordance with the Code of Practice (DECCW 2010a) and adhere to the methodology provided below.

- The test excavation area will be marked out as a series of 50 centimetre by 50 centimetre (test pits).
- Each test pit will be excavated using 5 centimetre spits.
- Each test pit will be excavated to clay or up to a depth of 1.25 metres.
- A soil sample will be collected from each spit of one test pit within each of the broader excavation areas for geomorphic analysis as required.
- Photographic and to scale hand drawn records of the stratigraphy/soil profile will be completed for each test pit with artefacts.
- Excavated materials (with the exception of sediments from a hearth or heat treatment pit) will be dry sieved through nested 2 and 5 millimetre gauge sieves in order to ensure that all artefactual material is retained.
- Should any features (such as a hearth or heat treatment pit or an accumulation of animal bone or shell likely to relate to Aboriginal cultural activities) be identified, they will be excavated in accordance with the methodology provided in **Section 10.4.3**.

- Should any human, or potential human skeletal material (single bones or an intact burial) be located within any excavated area, it will be managed in accordance with the methodology provided in **Section 10.6**.

- At the completion of the excavation the test excavations will be backfilled.

10.4.3 Excavation of Features

The following methodology will be used for excavation of a feature such as a hearth, heat treatment pit, ground oven or dense artefact concentration:

- The surface of the exposed feature will be cleaned by hand (using trowels, hand shovels and brushes as required) to allow the edges of the feature within the test pits and across the broader test excavation area to be identified

- The surface extent of the feature within the test excavation area/test pits will be planned and photographed

- The area of the feature within the test excavation area will then be excavated using the 50 centimetre test pits to cross-section (half-sectioned) the feature. The excavation will be undertaken using trowels to investigate the dimensions and orientation of the feature. The excavation will proceed according to the stratigraphy (if any) of the in-filling materials or in 5 centimetre spits if there is no clearly defined stratigraphy

- The feature will be photographed in cross-section and a stratigraphic profile of the cross-section will be recorded

- The area of the feature within the test excavation area will then be excavated in its entirety. Any part of the feature remaining outside the excavation area will be left in situ. All excavated materials (including those from the original cross-section excavation) will be retained for analysis and samples of relevant materials may then be sent for additional analysis, including radio-carbon dating

- Deposits from around the feature from within the test excavation area will be sieved using nested 2 and 5 millimetre sieves

- At a minimum soil samples from around the feature will be collected for each stratigraphic unit and

- Following removal of the feature subsurface testing will resume using the methodology in **Section 10.4.2.**

10.5 Human Skeletal Material or Suspected Human Skeletal Material

If human skeletal material or skeletal material assessed as likely to be human is uncovered during the test excavations all excavation will cease. Contact will be made with the NSW Police, the OEH Regional Operations Archaeologist and all Aboriginal stakeholders. An appropriate course of action will be determined in consultation with all parties prior to the recommencement of work in the project area.

10.6 Methodology for the Stone Artefact Recording and Analysis

Following the completion of each test excavation and prior to reburial, any salvaged stone artefacts (if any) will have the following attributes recorded for analysis. These attributes have been chosen as they will not only provide the data required to understand the nature and significance of the project area locally, but they will also allow for comparative analysis with other assemblages in the Nelligen area.

All Stone Artefacts

All of the artefacts will be bagged and tagged in accordance with Museum standards. Thus they will be identified to the location from which they were recovered, the type of salvage methodology (e.g. manual excavation and spit number). This information will be recorded in the database for all artefacts.

Artefact Class will be recorded for all artefacts (e.g. flake, broken flake, retouched flake, flaked piece, core, axe, grindstone, hammerstone, anvil, manuport, heat shatter etc.).

Raw Material Type will be recorded for all artefacts.

For all whole flakes the following attributes will ALSO be recorded:

- Length
- Width
- Thickness
- % Cortex
- Cortex Type
- Platform Preparation (will also be recorded on proximal flake portions)
- Dorsal Scar Count and Rotation
- Visible Use-Wear (yes/no)
- Visible Residue (yes/no)
- Comments – description, does it conjoin with another artefact, if used which margin was used, if it has residues where are the residues on the flake etc.)
- Individual Photo (yes/no as identified by RAPs and archaeologists during the test excavations and the archaeologists during the attribute recording process)

For all retouched flakes the following attributes will ALSO be recorded:

- Retouched Flake Class and Broken Retouched Flake Class (e.g. backed blade, backed point, backed flake, flake used as a core)
- Retouch type (acute, steep, unifacial, bifacial, tranchet etc. - can be more than one of these)
- Length

- Width
- Thickness
- % Cortex
- Cortex Type
- Visible Use-Wear (yes/no)
- Visible Residue (yes/no)
- Comments – description, does it conjoin with another artefact, if used which margin was used, if it has residues where are the residues on the flake)
- Individual Photo (yes/no as identified by RAPs and archaeologists during the test excavations and the archaeologists during the attribute recording process)

For all cores the following attributes will ALSO be recorded:

- Length
- Width
- Thickness
- % cortex
- Cortex Type
- Platform Preparation
- Rotation (count)
- Exhaustion (exhausted, almost exhausted, not exhausted)
- Visible Use-Wear (yes/no)
- Comments – description, does it conjoin with another artefact, if used which margin was used, if it has residues where are the residues on the core)
- Individual Photo (yes/no as identified by RAPs and archaeologists during the test excavations and the archaeologists during the attribute recording process)

For any axes, grindstones, anvils, manuports, hammerstones, etc the following attributes will ALSO be recorded:

- Length
- Width
- Thickness

- % cortex
- Cortex Type
- Visible Use-Wear (yes/no)
- Visible residue (yes/no)
- Comments
- Individual Photo (yes/no as identified by RAPs and archaeologists during the test excavations and the archaeologists during the attribute recording process)

Following the artefact attribute recording, the results will be subject to comparative analysis (subsurface) within the project area assemblage (intra-site comparative analysis) and with other assemblages (inter-assemblage analysis) which have been recorded in a similar manner and for which this data is available from around the Nelligen area.

Shell and Non-Human Bone

Any shell or non-human bone recovered will be subject to identification to species where possible. Minimum number of individuals (MNI) and number of individual specimens (NISP) will be identified. The material will be measured and weighed and bagged and tagged to museum standards.

10.7 Reporting

In accordance with the Code of Practice (DECCW 2010a) the information obtained during the test excavations will be used to assist with assessing the cultural significance of the project area, to inform the Aboriginal cultural heritage assessment and to identify any requirement for an application for an OEH AHIP.

10.8 Care and Control

At the completion of the test excavations and prior to backfilling any artefactual material recovered will be recorded on-site prior to reburial. The artefacts will be reburied in a secure temporary storage location in accordance with Requirement 26 of the Code of Practice (DECCW 2010a) pending any agreement reached as to the long-term management of the Aboriginal artefactual material. A site card will then be prepared for OEH that identifies the status of the project area/part project area as a site and identifies the nature and location of the reburied artefactual material.

BBLALC will subsequently apply to OEH for a Care and Control Permit to allow the LALC to recover and retain the artefacts for teaching and display purposes.

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