

**UPGRADING THE PACIFIC HIGHWAY**

**Woolgoolga to Ballina Upgrade**

**Working Paper**

**Aboriginal Cultural Heritage Assessment**

**Iluka Road to Woodburn Section**

**November 2012**

**Authors: Joseph Brooke, Robyn Jenkins, Andrew Costello,  
Vanessa Edmonds, and Amanda Goldfarb**

PUBLIC

## Preface

The purpose and scope of this working paper is to describe and assess Aboriginal cultural heritage impacts that would occur as a result of the upgrade of the Pacific Highway between Woolgoolga and Ballina (the project).

This working paper comprises four parts based on geography (from south to north):

- Woolgoolga to Wells Crossing
- Wells Crossing to Iluka Road
- Iluka Road to Woodburn
- Woodburn to Ballina.

The four parts reflect the previous development projects that now make up the project (Figure 1). These divisions have been retained for this Aboriginal heritage assessment primarily to maintain continuity in the Aboriginal community consultation and participation process from the previous development projects.

Each of the four parts is made up of two volumes:

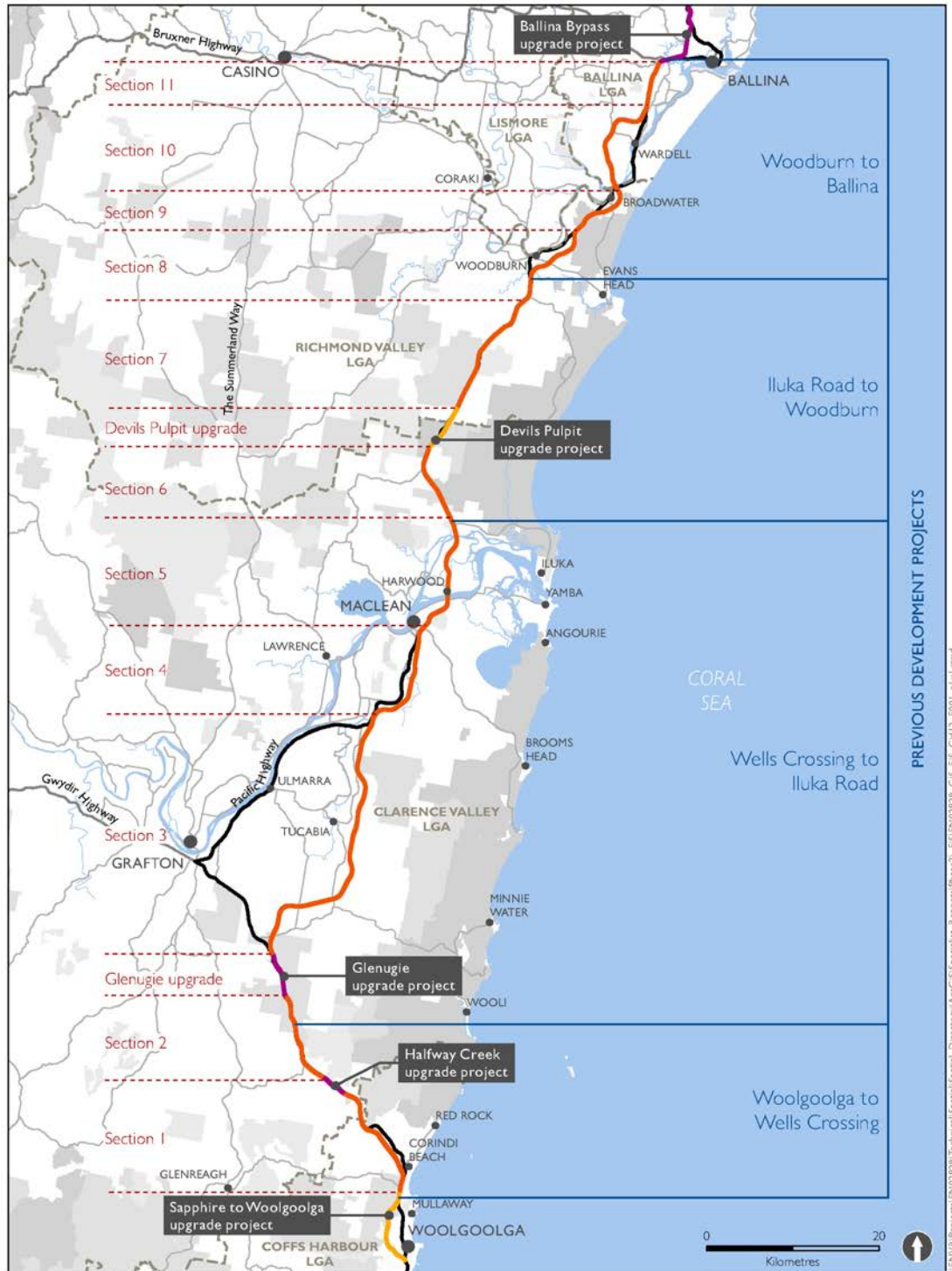
- Volume 1 – Aboriginal cultural heritage assessment report (CHAR)
- Volume 2 – Appendices.
  - Appendix A: Archaeological assessment for the relevant section.
  - Appendix B: Glossary of terms used in the Cultural Heritage Assessment Reports.
  - Appendix C: The Director-General's environmental assessment requirements.
  - Appendix D and E: Records of past and previous consultation.
  - Appendix F: The matrix of the ancillary works area assessment.
  - Appendix G: Predictive model maps produced by the Office of Environment and Heritage.
  - Appendix H: Maps showing the location of survey coverage and areas highlighted for survey priority in the Office of Environment and Heritage's predictive modelling.
  - Appendix I: Details the coverage of survey undertaken.
  - Appendix J: Tabulated sub-surface test-excavation results.
  - Appendix K: Summary of all sub-surface testing undertaken.
  - Appendix L: Stratigraphic drawings of soil profiles encountered during sub-surface testing.
  - Appendix M: Photos of the sites investigated.
  - Appendix N: Analysis of artefact / material discovered during investigations.
  - Appendix O: Results of radiocarbon dating (Woodburn to Ballina only).
  - Appendix P: Results of the ground-penetrating radar investigation (Woodburn to Ballina only).

Together the volumes for these four parts make up the working paper on Aboriginal cultural heritage for the entire project.

Each cultural heritage assessment report (Volume 1) has the following structure:

- Introduction (Chapter 1) - provides a broad overview of the project and a general description of the study area. It also identifies the purpose and structure of this report.
- Legislative context (Chapter 2) - outlines the statutory requirements and context of the project with regard to the Aboriginal heritage investigations.
- Consultation (Chapter 3) - describes the consultation process undertaken and summarises the outcomes.
- Existing environment (Chapter 4) – outlines the desktop assessment undertaken to determine the existing heritage conditions prior to undertaking investigations within the Alliance, including geology, geomorphology, vegetation, natural resources and recorded Aboriginal archaeological sites.
- Aboriginal cultural assessment (Chapter 5) – provides the Aboriginal cultural assessment undertaken to identify Aboriginal cultural values within the region of the project, with a particular focus on the intangible and historic Aboriginal cultural places that are not necessarily identified during the archaeological assessment, which focuses on material and pre-contact archaeological sites.
- Summary of archaeological assessment (Chapter 6) – provides a summary of the archaeological field investigations undertaken for the project, including field survey and sample sub-surface test-excavation, and the archaeological sites identified through this process. The full archaeological assessment is presented in Volume 2, Appendix A.
- Significance assessment (Chapter 7) – describes the process and results of assessing the significance of all identified Aboriginal cultural heritage values identified within or adjacent to the project.
- Impact assessment (Chapter 8) – describes the process and results of assessing how the project will avoid or impact on Aboriginal heritage values.
- Management recommendations (Chapter 9) – describes the general and specific management recommendations proposed for the project to protect, minimise and mitigate impact to Aboriginal heritage values. Management recommendations are appropriate to the assessed significance of the sites and places and the proposed impact from the project, and were developed with input from registered Aboriginal stakeholders.
- References (Chapter 10) – all references for each cultural heritage assessment report and archaeological assessment are presented in this chapter.

## Upgrading the Pacific Highway – Woolgoolga to Ballina Upgrade



- The project
- Upgrade completed to dual carriageway
- Upgrade under construction
- Existing Pacific Highway

**Figure 1 Previous project sections compared with current project alignment**

PUBLIC

## Contents

### Volume 1: Cultural heritage assessment report

#### Executive summary

<b>1. Introduction</b>	<b>11</b>
1.1. Overview	11
1.2. Study objectives and scope	11
1.2.1. Objectives	11
1.2.2. Scope of assessment	11
1.2.3. Study requirements	12
1.2.4. Definitions	13
1.2.5. Study area	14
1.3. The project	17
1.3.1. Project description	17
1.3.2. Project route development	18
1.3.3. Previous Aboriginal heritage assessment	18
1.3.4. Project sections	19
<b>2. Legislative context</b>	<b>23</b>
<b>3. Consultation</b>	<b>27</b>
3.1. Consultation and assessment process	27
3.1.1. Overview of consultation	27
3.2. Consultation and assessment requirements	28
3.2.1. Roads and Maritime Services consultation procedure	28
3.2.1.1. Consultation requirements for proponents	28
3.3. Previous Aboriginal community consultation	29
3.3.1. Aboriginal focus groups 2005 - 2006	29
3.4. Current consultation activities	29
3.4.1. Methodology	29
3.4.2. Aboriginal focus groups 2010 - 2012	30
3.4.3. Notification, identification and registration of stakeholders	32
3.4.3.1. Summary of issues raised at Aboriginal focus group meetings	33
3.4.4. Participation in fieldwork	33
3.4.5. Aboriginal stakeholder comment on cultural heritage assessment report	35
3.5. Consultation with government agencies	36
<b>4. Existing environment</b>	<b>37</b>
4.1. Regional context	37
4.1.1. Land systems	38
4.1.2. Geology and geomorphology	38

4.1.3.	Vegetation	39
4.2.	Ethnographic record	39
4.2.1.	Aboriginal tribal boundaries	39
4.2.2.	Social organisation	40
4.2.3.	Settlement patterns	41
4.2.4.	Material culture	41
4.2.5.	Resources	41
4.2.6.	Spiritual locations and culture	42
4.2.7.	European and Aboriginal interaction	42
4.3.	Historical land use and current site condition	43
4.4.	AHIMS register search	46
<b>5.</b>	<b>Aboriginal cultural assessment</b>	<b>48</b>
5.1.	Introduction	48
5.2.	Methodology	48
5.3.	Cultural landscape	48
5.4.	Identified Aboriginal cultural heritage values	49
5.5.	Aboriginal cultural places within or adjacent to boundary of the project	50
5.6.	Aboriginal cultural places near the boundary of the project	50
<b>6.</b>	<b>Summary of archaeological assessment</b>	<b>52</b>
6.1.	Assessment methodology	52
6.2.	Ancillary works assessment	53
6.3.	Results of the archaeological assessment	56
<b>7.</b>	<b>Significance assessment</b>	<b>59</b>
7.1.	Methodology	59
7.1.1.	Basis for assessment	59
7.1.2.	Social significance	59
7.1.3.	Scientific significance	59
7.1.4.	Aesthetic significance	60
7.1.5.	Historic significance	60
7.1.6.	Scale of significance	60
7.2.	Statements of significance	61
7.2.1.	IR2W1 (AHIMS ID 13-1-0114)	61
7.2.2.	Scarred/engraved Tree (AHIMS ID 13-1-0111)	61
7.2.3.	IR2W2 (AHIMS ID 13-01-0112)	62
7.2.4.	C3/2/2 (AHIMS ID 13-01-0110)	63
7.2.5.	IR2W3 (AHIMS ID 13-1-0113)	64
7.2.6.	Saw Pit Creek (AHIMS ID 13-1-0059)	64
7.2.7.	IR2W4 (AHIMS ID 13-01-0115)	65
7.3.	Summary	66
<b>8.</b>	<b>Impact assessment</b>	<b>67</b>



8.1.	Impact avoidance	67
8.2.	Impacts	68
8.3.	Cumulative impact	69
8.3.1.	Introduction	69
8.3.2.	Assessment	70
8.3.3.	Assay of the Pacific Highway upgrade program	71
<b>9.</b>	<b>Management recommendations</b>	<b>72</b>
9.1.	General project management requirements	73
9.2.	Effectiveness of mitigation	74
9.3.	Specific management requirements	74
9.3.1.	Archaeological sites	75
9.3.2.	Aboriginal cultural places	77
9.3.3.	Ancillary areas	77
9.4.	Management Procedures	77
9.4.1.	Unexpected discovery of archaeological finds	77
9.4.2.	Notification and reporting of incidents that breach this management plan	78
<b>10.</b>	<b>References</b>	<b>80</b>

## **Volume 2: Appendices**

<b>Appendix A</b>	<b>Aboriginal Archaeological Assessment Report</b>	<b>1</b>
<b>Appendix B</b>	<b>Glossary</b>	<b>60</b>
<b>Appendix C</b>	<b>Director-General requirements</b>	<b>69</b>
<b>Appendix D</b>	<b>Previous Aboriginal community consultation</b>	<b>87</b>
<b>Appendix E</b>	<b>Current Aboriginal community consultation</b>	<b>106</b>
<b>Appendix H</b>	<b>Survey coverage and priority</b>	<b>172</b>
<b>Appendix I</b>	<b>Survey coverage</b>	<b>174</b>
<b>Appendix J</b>	<b>Summary of subsurface testing results</b>	<b>187</b>
<b>Appendix K</b>	<b>Summary of all excavations</b>	<b>203</b>
<b>Appendix L</b>	<b>Stratigraphic drawings</b>	<b>227</b>
<b>Appendix M</b>	<b>Site photos</b>	<b>248</b>
<b>Appendix N</b>	<b>Artefact analysis</b>	<b>253</b>

## List of Tables

Table 1-1 Summary of recommendations for archaeological sites	8
Table 1-1 Director-General's environmental assessment requirements for key issue Aboriginal heritage	13
Table 1-2 Summary of project sections in relation to the CHAR assessments (bold type indicates the Iluka Road to Woodburn project section assessed in this report)	14
Table 1-3 Project sections (bold type indicates the Iluka Road to Woodburn project section assessed in this report)	19
Table 2-1 Legislative framework	23
Table 3-1 AFG meetings held for Iluka Road to Woodburn route options investigations	29
Table 3-2 Aboriginal focus group meetings held for Iluka Road to Woodburn 2010 - 2012	30
Table 3-3 Native Title claimants relevant to Iluka Road to Woodburn; no Native Title holders exist for the project Sections 6 to 8	32
Table 3-4 Site officers participating in field assessments	34
Table 3-5 Comments received from Aboriginal stakeholders	36
Table 4-1 Summary of land systems within the project	37
Table 4-2 Listings on AHIMS located within 200 metres of the boundary of the project	46
Table 5-1 Cultural heritage values identified by registered Aboriginal parties	49
Table 5-2 Aboriginal cultural places within or adjacent to the boundary of the project	50
Table 5-3 Aboriginal cultural places near the boundary of the project	50
Table 6-1 Status of areas or sites investigated by survey and sub-surface testing in the boundary of the project between Iluka Road and Woodburn	58
Table 8-1 Impacts to archaeological sites and Aboriginal cultural places within and/immediately adjacent to the boundary of the project between Iluka Road and Woodburn	68
Table 9-1 Summary of management recommendations for archaeological sites near or within the boundary of the project	72
Table 9-2 Management requirements for archaeological sites within the boundary of the project between Iluka Road and Woodburn	75

## Table of Figures

Figure 1-1 The project alignment - Iluka Road to Woodburn	16
Figure 1-2 Section 6 – Iluka Road to Devil’s Pulpit upgrade	20
Figure 1-3 Section 7 – Devils Pulpit upgrade to Trustums Hill	21
Figure 1-4 Section 8 – Trustums Hill to Broadwater National Park	22
Figure 4-1 Accumulated impact within the boundary of the project from post-colonial land-use	45
Figure 4-2 Iluka Road to Woodburn – Aboriginal heritage sites (registered on AHIMS)	47
Figure 6-1 Management process to apply to construction ancillary sites	54
Figure 7-1 Summary of significance assessment of sites/places near or within the boundary of the project between Iluka Road and Woodburn	66

## Executive summary

This report is the Aboriginal cultural heritage assessment report (CHAR) for the Woolgoolga to Ballina Pacific Highway Upgrade Project (the project), from Iluka Road and Woodburn. The purpose of this CHAR is to describe and assess potential Aboriginal cultural heritage impacts created by the proposed upgrade of the Pacific Highway between Iluka Road and Woodburn. This report has been prepared to inform the Environmental Impact Statement (EIS) and is generally consistent with the Draft Guidelines for Aboriginal Cultural Heritage Impact Assessment and Community Consultation (Department of Environment and Conservation [DEC] 2005).

This CHAR considers work undertaken during both the route option phase and the detailed assessment phase, and includes discussions on all aspects relating to consultation, environmental background, the archaeology and cultural heritage values present, significance and impact assessments, and management recommendations. The archaeological assessment component of this report is included as Appendix A in Volume 2, while a summary of this assessment is included in this report.

The Woolgoolga to Ballina upgrade of the Pacific Highway is described in 11 sections. This CHAR reports on Sections 6, 7 and 8 between Iluka Road and Woodburn.

### Consultation

Aboriginal stakeholders have been involved throughout the project between Iluka Road and Woodburn to date and consultation has been undertaken in accordance with the Roads and Maritimes Services' (RMS) Procedure for Aboriginal Cultural Heritage Consultation and Investigation 2011 (PACHCI), and the Office of Environment and Heritage's (OEH) Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010, (as well as the now redundant Draft Guidelines for Aboriginal Cultural Heritage Impact Assessment and Community Consultation [DEC 2005], and Interim Community Consultation Requirements for Applicants [Department of Environment and Climate Change 2005]). This included Aboriginal community involvement at Aboriginal focus group (AFG) meetings during the route development and concept design phases; reviewing and commenting on draft reports; and undertaking fieldwork activities.

### Assessment findings

The full archaeological assessment for Iluka Road to Woodburn can be found in Volume 2, which accompanies this document.

A total of 2,699,753 square metres (84 per cent) of the boundary of the project was subject to field survey. The remaining area was assessed as not requiring survey due to limited potential as a result of prior disturbance in those areas.

Following survey, one stand-alone potential archaeological deposit (PAD), two stone artefact sites with PAD components, and two isolated stone artefact sites were identified near or within the boundary of the project between Iluka Road and Woodburn. A further three sites were located during heritage register searches adjacent to the boundary of the project. Sub-surface testing was carried out on all of the PADs (either standalone PADs or associated with sites); two of which contained sub-surface Aboriginal deposits. As a result of the sub-surface testing, the status of PADs were either confirmed to be sites, or reassessed as not having archaeological potential if no archaeological material was found.

One Aboriginal cultural place was identified adjacent to the boundary of the project between Iluka Road and Woodburn, and is not likely to be impacted by the project. A total of four archaeological sites are near or within the boundary of the project and will be impacted by the project between Iluka Road and Woodburn. Three known sites adjacent to but outside the boundary of the project are not likely to be directly or indirectly impacted.

## Management recommendations

A number of management recommendations were developed for Aboriginal cultural places and archaeological sites within the boundary of the project between Iluka Road and Woodburn. A summary of the recommendations for archaeological sites is included below, while Chapter 9 includes full recommendations for both archaeological sites and Aboriginal cultural places.

**Table 1-1 Summary of recommendations for archaeological sites**

Project sections	Management recommendations	Number of sites	Name of site
8	Collection and salvage excavations (mechanical). Detailed analysis and reporting of cultural material. Dating of cultural material where applicable.	1	IR2W4
7, 8	Collection of artefacts. Detailed analysis and reporting of cultural material. No salvage excavation required.	3	IR2W1 IR2W2 IR2W3

## Abbreviations

ACHCRP	Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010
AFG/s	Aboriginal focus group/s
AHIMS	Aboriginal heritage information management system
AHIP	Aboriginal heritage impact permits
ASIRF	Aboriginal site impact recording form
CHAR	Cultural heritage assessment report
DEC	NSW Department of Environment and Conservation (now the Office of Environment and Heritage)
DECC	NSW Department of Environment and Climate Change (now the Office of Environment and Heritage)
DECCW	NSW Department of Environment, Climate Change and Water (Now the Office of Environment and Heritage)
DPI	Department of Primary Industries
DP&I	NSW Department of Planning & Infrastructure
EIS	Environmental impact statement
EPA	Environmental protection agency
EPBC Act	Environment Protection and Biodiversity Conservation Act 1999
g	Gram/s
GIS	Geographic information system
GPS	Global positioning system
H	High
ha	Hectare/s
ICOMOS	International Council of Monuments and Sites
km	Kilometre/s
L	Low
LALC	Local Aboriginal land council

# PUBLIC

Woolgoolga to Ballina Pacific Highway Upgrade  
Aboriginal Heritage Assessment – Iluka Road to Woodburn  
Volume 1: Cultural Heritage Assessment Report

LEP	Local environmental plans
LGA	Local government areas
m	Metre/s
M	Moderate
mm	Millimetre/s
MPC	Multiplatform core
n	Number
N/A	Not applicable
NPWS	NSW National Parks and Wildlife Service (part of the OEH)
NSW	New South Wales
OEH	Office of Environment and Heritage
PACHCI	Procedure for Aboriginal cultural heritage consultation and investigation
PAD	Potential archaeological deposit
RTA	Roads and Traffic Authority of NSW
RMS	NSW Roads and Maritime Services
SKM	Sinclair Knight Merz Pty Ltd
SPC	Single platform core
STP	Shovel test pits
TBA	To be announced
TBC	To be confirmed
UNESCO	United Nations educational, scientific and cultural organisation

## 1. Introduction

### 1.1. Overview

The RMS is seeking approval under Part 5.1 of the *Environmental Planning and Assessment Act 1979* to upgrade around 155 kilometres of the Pacific Highway from Woolgoolga to Ballina.

The purpose of this CHAR is to describe and assess Aboriginal cultural heritage impacts that would occur as a result of the proposed upgrade of the Pacific Highway between the Iluka Road and Woodburn sections of the project. This CHAR has been prepared to inform the EIS, which accompanies the project approval application.

This CHAR covers the project from Iluka Road to Woodburn; three other reports have been prepared that cover sections from Woolgoolga to Wells Crossing, Wells Crossing to Iluka Road, and Woodburn to Ballina, respectively.

### 1.2. Study objectives and scope

#### 1.2.1. Objectives

The purpose of this study is to undertake a detailed assessment of Aboriginal heritage within the boundary of the project between Iluka Road and Woodburn to determine the level of impacts from the project.

The objectives of this Aboriginal cultural heritage assessment report are to:

- Undertake an Aboriginal cultural heritage assessment, including an archaeological assessment, in accordance with relevant guidelines.
- Prepare a technical paper which addresses the Department of Planning and Infrastructure (DP&I) Director-General's requirements.
- Summarise and present the cultural heritage assessment to ensure that potential impacts have been assessed and issues finalised, to allow an informed decision to be made by all stakeholders.

The Aboriginal heritage assessment is presented in two volumes:

- Volume 1: Cultural heritage assessment report.
- Volume 2: Archaeological assessment (Appendix A) and supporting information (Appendices B-N).

#### 1.2.2. Scope of assessment

Broadly, the scope of the Aboriginal cultural heritage assessment was as follows:



- Meet the Department of Planning and Infrastructure Director-General's environmental assessment requirements.
- Identify gaps in previous Aboriginal heritage assessment (Collins 2008) and address these through further desktop assessment.
- Undertake comprehensive Aboriginal stakeholder consultation (both through meetings and field investigations).
- Undertake field investigations (survey and test excavation) with registered Aboriginal party site officers to investigate known sites and identify and test PADs to better define the Aboriginal cultural heritage values within the boundary of the project.
- Undertake a significance assessment of the sites and places identified. This includes both scientific (archaeological) and cultural (determined by Aboriginal stakeholders).
- Provide an assessment of the potential impact/harm to Aboriginal cultural heritage sites and places.
- Develop management recommendations in consultation with registered Aboriginal parties in order to ensure that prior to, during and after construction Aboriginal cultural heritage sites and places are effectively managed. The level of management required would be based on the identified impacts and the significance of the site or place.
- Provide a completed CHAR for the project.

### 1.2.3. Study requirements

The investigations and assessments were undertaken with regard to the OEH Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales (NSW) 2010, Guide to Investigating, Assessing and Reporting on Aboriginal Cultural Heritage in NSW (OEH 2011) and the Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010 (which replace the now obsolete Draft Guidelines for Aboriginal Cultural Heritage Impact Assessment and Community Consultation [DEC 2005]).

This assessment has been undertaken in compliance with RMS' PACHCI.

Additionally, this assessment was based upon the DP&I Director-General's environmental assessment requirements, issued on the 23 November 2011 for the project relating to Aboriginal heritage.

Table 1-1 details the Director General's environmental assessment requirements relating to Aboriginal heritage and where these are addressed within this report. These requirements require assessment of the impacts to sites and places 'within or near' the boundary of the project. However, it should be noted that areas near but outside the boundary of the project have not been able to be comprehensively investigated or surveyed, and no sub-surface investigation was undertaken, as this is beyond the scope and authority of this assessment.

**Table 1-1 Director-General’s environmental assessment requirements for key issue  
Aboriginal heritage**

Requirements	Where addressed in report?
Investigation of impacts to Aboriginal heritage (including cultural and archaeological significance), in particular impacts to Aboriginal heritage sites identified within or near the project should be assessed.	Chapter 5, 6, 7 and 8
Where impacts are identified, the assessment shall: <ul style="list-style-type: none"> <li>Outline the proposed mitigation and management measures (including measures to avoid significant impacts and an evaluation of the effectiveness of these measures), generally consistent with the Draft Guidelines for Aboriginal Cultural Heritage Impact Assessment and Community Consultation (DEC 2005).<sup>1</sup></li> </ul>	Chapter 3 and 9
<ul style="list-style-type: none"> <li>The assessment shall be undertaken by a suitably qualified heritage consultant.</li> </ul>	Chapter 6 Chapter 2
<ul style="list-style-type: none"> <li>The assessment shall demonstrate effective consultation with Aboriginal communities in determining and assessing impacts and developing and selecting options and mitigation measures (including the final proposed measures).</li> </ul>	Chapters 3 and 9 Volume 2
<ul style="list-style-type: none"> <li>The assessment shall develop an appropriate archaeological assessment methodology, including research design, to guide physical archaeological test excavations of the areas of PAD identified in a manner that establishes the full spatial extent and significance of any archaeological evidence across each area of PAD, and include the results of these excavations.</li> </ul>	Chapter 6 Volume 2

This Aboriginal cultural heritage assessment report was undertaken by fully qualified and experienced archaeologists and heritage consultants, primarily Joseph Brooke (Bachelor of Archaeology (Honours), 6 years experience), Robyn Jenkins (Bachelor of Arts, Bachelor of Social Science (Honours), and 5 years experience), and Vanessa Edmonds (Bachelor of Arts, Master of Letters, 25 years experience).

#### 1.2.4. Definitions

In this report, the term ‘site’ and ‘place’ are used to refer to Aboriginal archaeological sites (the same as *objects* in the *National Parks and Wildlife Act 1974*), and intangible or non-archaeological

<sup>1</sup> These guidelines have been superseded by Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010 (OEH). Both the 2010 requirements and the 2005 guidelines are followed in this CHAR.

Aboriginal cultural places (not necessarily declared *Aboriginal places* as per *National Parks and Wildlife Act 1974*), respectively.

The term ‘project’ is used to refer to, and includes, the construction and operational footprints of the Woolgoolga to Ballina upgrade of the Pacific Highway.

The capitalised term ‘Section’ has been used to generally describe the sections of this report. Lower case use of the word ‘section’ is generally used to describe the project sections (eg section 7, in the boundary of the project between Iluka Road and Woodburn).

## 1.2.5. Study area

The area subject to this assessment includes the section of the project between Iluka Road and Woodburn. The alignment of the project within the context of the region is shown in Figure 1-1.

The boundary of the project is generally 100 metres wide with interchanges and areas of large cutting and earth embankments typically being wider. The operational footprint of the project includes ancillary elements, such as local access roads and permanent water quality basins, all of which are located within the project design boundary – referred to as the boundary of the project. The study area encompasses the boundary of the project and any peripheral land areas where indirect impacts may occur. Finally, the study region is discussed in terms of the general landscape in which the project is located, which in the broader context is the NSW North Coast region.

The future delivery of the project would be staged in sections based on upgrade need and availability of funding. For the purposes of planning this future staging, the project has been divided into 11 indicative sections as listed in Table 1-2.

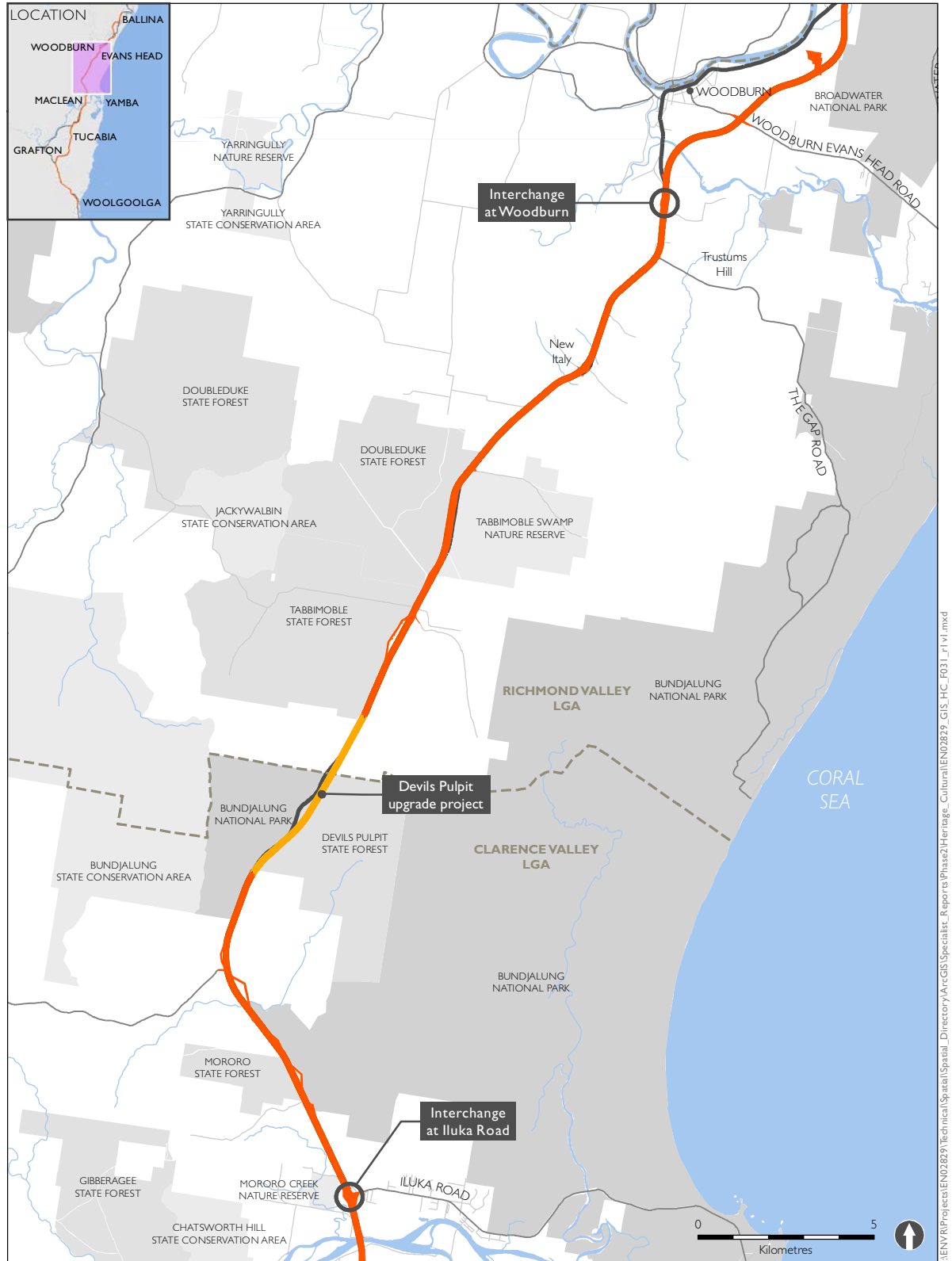
For the purposes of this report, only the project between Iluka Road and Woodburn is examined, specifically project section 6, section 7, and section 8 (in Table 1-2).

**Table 1-2 Summary of project sections in relation to the CHAR assessments (bold type indicates the Iluka Road to Woodburn project section assessed in this report)**

Project section	Location	Relevant section and Aboriginal focus group
1	Woolgoolga to Halfway Creek	Woolgoolga to Wells Crossing
2	Halfway Creek to Glenugie upgrade	Woolgoolga to Wells Crossing
3	Glenugie upgrade to Tyndale	Wells Crossing to Iluka Road
4	Tyndale to Maclean	Wells Crossing to Iluka Road
5	Maclean to Iluka Road, Mororo	Wells Crossing to Iluka Road
<b>6</b>	<b>Iluka Road to Devil’s Pulpit upgrade</b>	<b>Iluka Road to Woodburn</b>
<b>7</b>	<b>Devil’s Pulpit upgrade to Trustums Hill</b>	<b>Iluka Road to Woodburn</b>
<b>8</b>	<b>Trustums Hill to Broadwater National Park</b>	<b>Iluka Road to Woodburn</b> and Woodburn to Ballina
9	Broadwater National Park to Richmond River	Woodburn to Ballina
10	Richmond River to Coolgardie Road	Woodburn to Ballina
11	Coolgardie Road to Ballina bypass	Woodburn to Ballina

## Upgrading the Pacific Highway - Woolgoolga to Ballina Upgrade

Figure 1-1 The project Alignment - Iluka Road to Woodburn



## 1.3. The project

### 1.3.1. Project description

The Iluka Road to Woodburn section of this project would achieve four lanes of divided highway from about five kilometres north of Woolgoolga to about six kilometres south of Ballina. The general location of the project is shown in Figure 1-1.

Key features of the project would include:

- A class M (motorway standard) highway, comprising a four-lane dual carriageway (two lanes in each direction) that can be upgraded to a six-lane dual carriageway in the future, if required.
- Ten grade-separated interchanges to provide access to and from the upgraded highway.
- Bridges for waterway crossings, including major bridges for the crossings of the Clarence River and Richmond River.
- Overbridges and underpasses to maintain access along local roads crossed by the upgraded highway.
- Viaduct structures in places where the upgraded highway would traverse low-lying or flood-prone areas.
- Service roads and access roads to maintain connections to existing local roads and properties.
- Rest areas located at 50 kilometre intervals for both northbound and southbound traffic.
- Structures to facilitate fauna passage over and under the upgraded highway.

In addition to the construction footprint, ancillary areas are required adjacent to the boundary of the project for construction. The impact of these ancillary areas would vary due to the different levels of ground disturbances required for each of the works. Ancillary areas would include:

- Main and satellite compound areas.
- Stockpile areas.
- Plant and workshops.
- Vehicle parking.
- Bridge construction areas.
- RMS site office.
- Materials processing areas.

The approval sought is for a class M upgrade standard, however, staging of the project would result in some sections being initially constructed to a class A (arterial) upgrade standard.

The project does not include the upgrades at Glenugie and Devils Pulpit, which are located between Woolgoolga and Ballina, as these two projects have already been approved.

### 1.3.2. Project route development

Planning for the project commenced in 2004 and has involved ongoing community consultation and environmental investigations. Route selection and concept design development was completed in four sections, which are referred to throughout this document as the 'previous development projects'. The four previous development projects were:

- Woolgoolga to Wells Crossing.
- Wells Crossing to Iluka Road.
- **Iluka Road to Woodburn (this CHAR).**
- Woodburn to Ballina.

The route development process for the previous development projects between Iluka Road and Woodburn typically involved the following steps:

- Assessing preliminary information on engineering, environmental, social and economic constraints.
- Identifying and developing potential route options.
- Short-listing and refining feasible route options for further investigation.
- Comparing short-listed options in terms of functional, environmental, social and economic criteria, with input from the community and stakeholders.
- Selecting the preferred route and developing the concept design for the preferred route.

Additional documentation supporting the development of the preferred route and concept design for the project, including methodology, working papers and outcomes of community and stakeholder involvement, is available on the RMS website [www.pacifichighwayupgrade.com.au](http://www.pacifichighwayupgrade.com.au) (click on Woolgoolga to Ballina).

### 1.3.3. Previous Aboriginal heritage assessment

Preliminary Aboriginal heritage assessment has previously been undertaken for this project between Iluka Road and Woodburn during an earlier phase of the project (Collins 2008). Collins' (2008) assessment commenced in 2007 and considered a study area similar to the current boundary of the project. Collins (2008) aimed to identify the Aboriginal heritage constraints within her study area, so that they could be considered in the concept design. Collins (2008) undertook:

- Consultation with relevant (at the time) Aboriginal stakeholders via an Aboriginal focus group (AFG) for the Iluka Road to Woodburn section to identify known Aboriginal cultural places within the relevant route options. Collins' consultation was in accordance with the NSW DECC Interim Community Consultation Requirements for Applicants (2005).
- Field survey across the study area, targeting areas that had previously not been surveyed for Aboriginal heritage, which are mostly located within the current boundary of the project.

## 1.3.4. Project sections

The Woolgoolga to Ballina project is described in 11 sections as identified in Table 1-3. Each of these sections has a start and end point which ties in to the existing highway, therefore assisting identification of project stages. Project stages may comprise one (or more than one) of those sections identified in Table 1-3. The sections relevant for this CHAR are sections 6, 7 and 8, as highlighted in the table, and shown in Figure 1-2, Figure 1-3 and Figure 1-4.

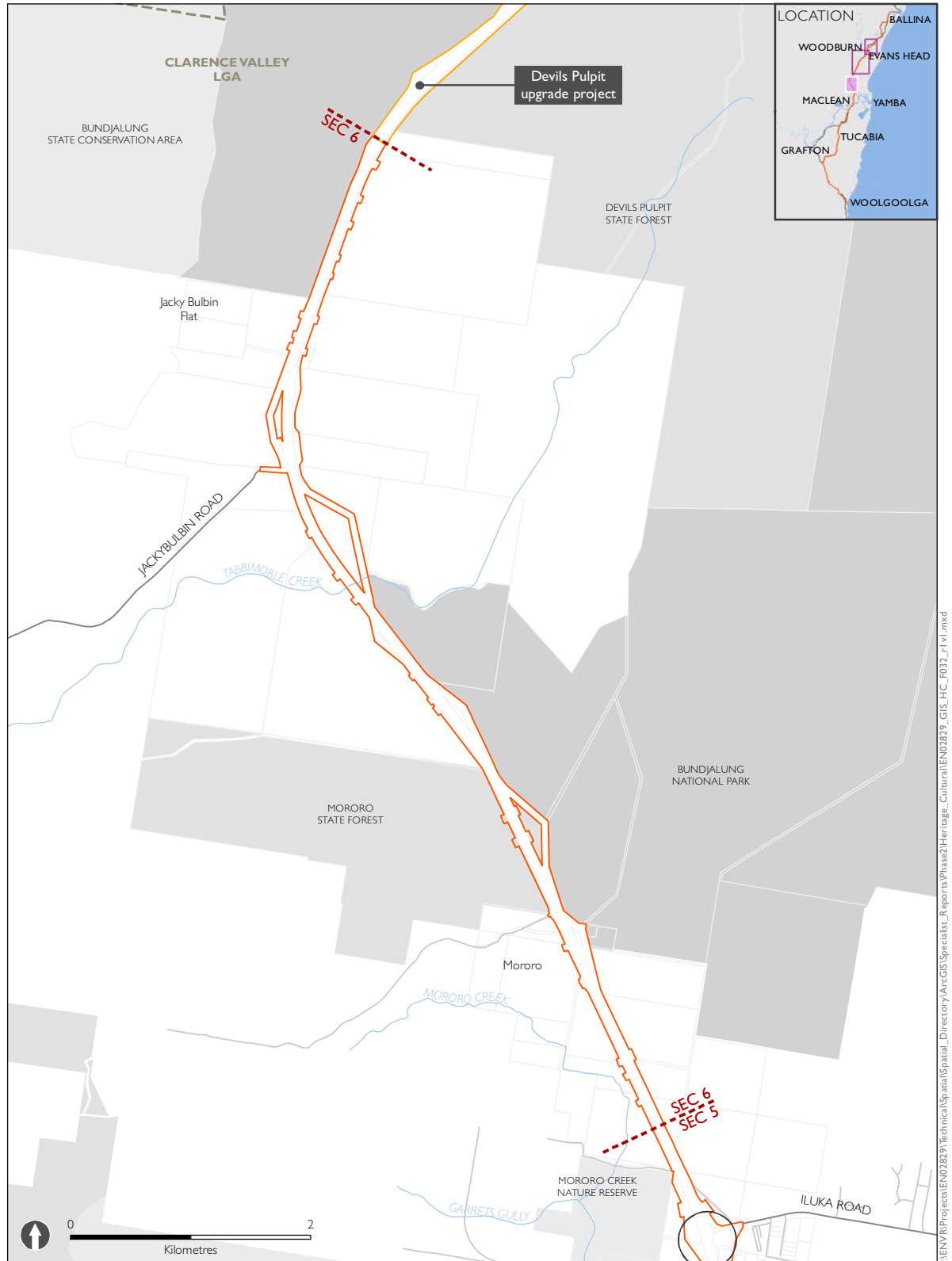
**Table 1-3 Project sections (bold type indicates the Iluka Road to Woodburn project section assessed in this report)**

Section	Location	Approximate chainage (m)		Length (km)	Initial upgrade standard
		Start	Finish		
1	Woolgoolga to Halfway Creek <i>1a: Woolgoolga to Range Road</i> <i>1b: Range Road to Halfway Creek</i>	0	9650	9.6	Class M
		9650	17,000	7.4	Class A
2	Halfway Creek to Glenugie upgrade	17,000	28,700	11.7	Class A
3	Glenugie upgrade to Tyndale	33,800	68,800	35.0	Class M
4	Tyndale to Maclean	68,800	82,000	13.2	Class M
5	Maclean to Iluka Road, Mororo <i>5a: Maclean to Watts Lane</i> <i>5b: Watts Lane to Iluka Road</i>	82,000	96,400	14.4	Class M
					Class A
<b>6</b>	<b>Iluka Road to Devil's Pulpit upgrade</b>	<b>96,400</b>	<b>105,600</b>	<b>9.2</b>	<b>Class A</b>
<b>7</b>	<b>Devil's Pulpit upgrade to Trustums Hill</b>	<b>111,100</b>	<b>126,400</b>	<b>15.3</b>	<b>Class A</b>
<b>8</b>	<b>Trustums Hill to Broadwater National Park</b>	<b>126,400</b>	<b>137,600</b>	<b>11.2</b>	<b>Class M</b>
9	Broadwater National Park to Richmond River	137,600	145,100	7.5	Class M
10	Richmond River to Coolgardie Road	145,100	158,600	13.5	Class M
11	Coolgardie Road to Ballina bypass	158,600	164,000	5.4	Class M

# PUBLIC

Upgrading the Pacific Highway - Woolgoolga to Ballina Upgrade

Figure 1-2 Section 6 - Iluka Road to Devils Pulpit upgrade

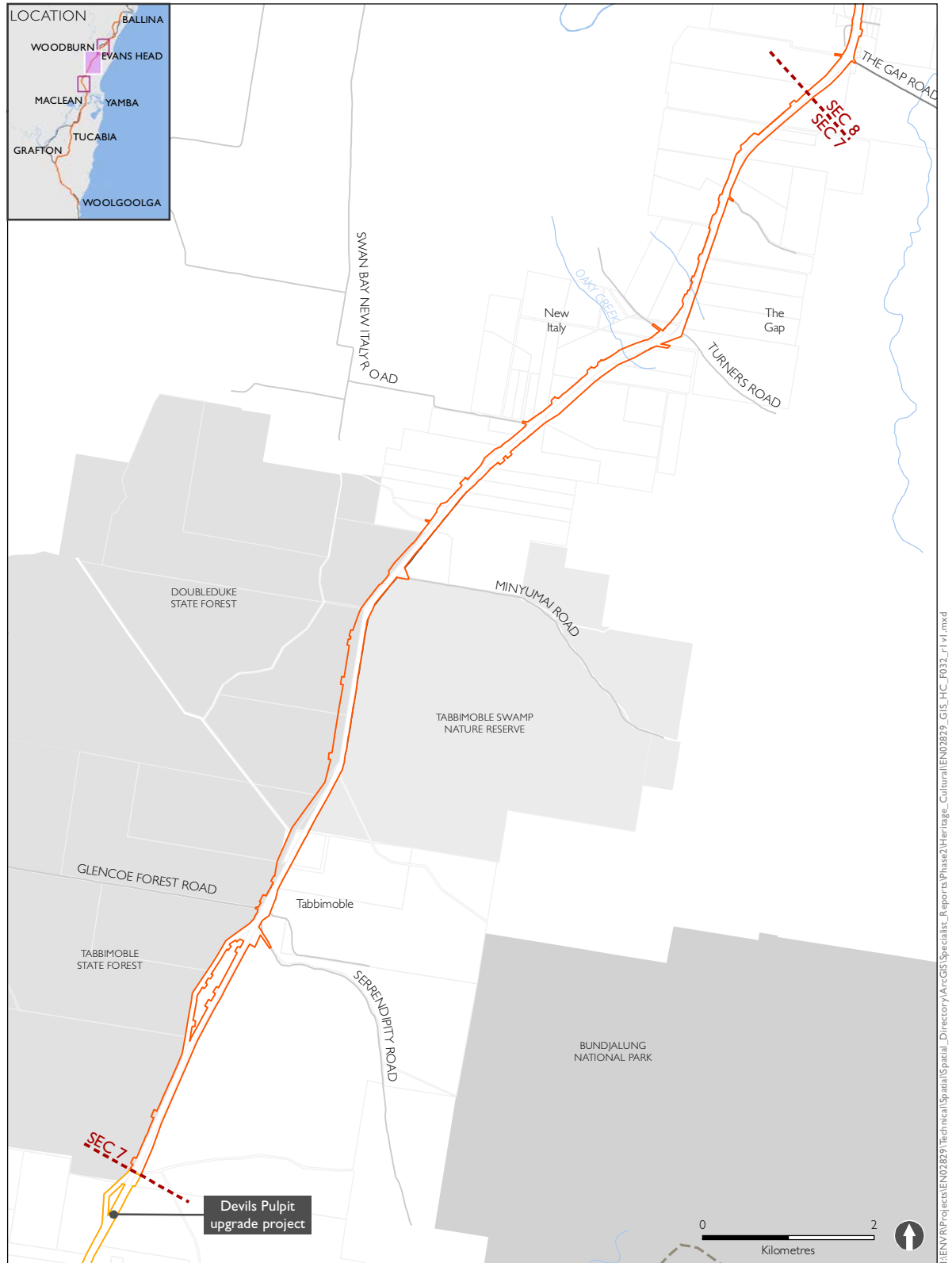


- The project
- Upgrade under construction
- Existing Pacific Highway



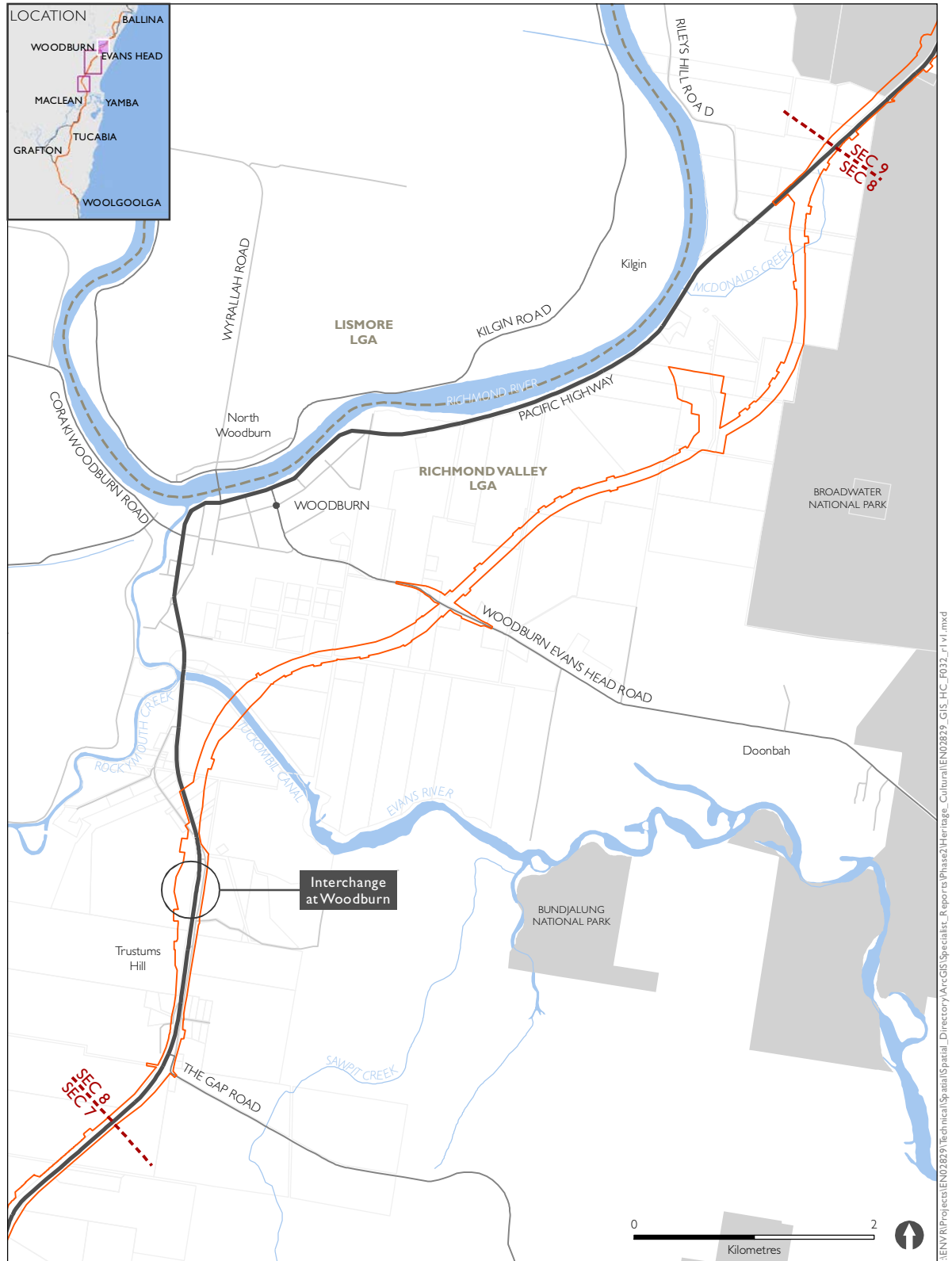
## Upgrading the Pacific Highway - Woolgoolga to Ballina Upgrade

Figure I-3 Section 7 - Devils Pulpit upgrade to Trustums Hill



## Upgrading the Pacific Highway - Woolgoolga to Ballina Upgrade

Figure 1-4 Section 8 - Trustums Hill to Broadwater National Park



- The project
- Upgrade under construction
- Existing Pacific Highway

## 2. Legislative context

The following legislation is relevant to this investigation:

### New South Wales

- *Environmental Planning and Assessment Act 1979.*
- *National Parks and Wildlife Act 1974.*
- *National Parks and Wildlife Amendment Act 2010.*
- *Native Title Act (NSW) 1994.*
- *Aboriginal Land Rights Act (NSW) 1983.*

### Commonwealth

- *Aboriginal and Torres Strait Islander Heritage Protection Act 1984.*
- *Environment Protection and Biodiversity Conservation Act 1999.*
- *Native Title Act 1993.*

Additionally, the United Nations' *Declaration on the Rights of Indigenous Peoples*, to which Australia is a signatory, also provides further legislative context.

These Acts and how their relevant sections and associated regulatory documents (eg codes of practice, guidelines, etc) govern the project are described in Table 2-1. It is important to note from Table 2-1 that this project has been assessed as 'state significant infrastructure' under Part 5.1 of the *Environmental Planning and Assessment Act 1979*. As such, an Aboriginal heritage impact permit (AHIP) under s.90 of the *National Parks and Wildlife Act 1974* would not be required to investigate Aboriginal objects within the project, provided that the investigations would address the DP&I Director-General's requirements (see Table 1-1).

**Table 2-1 Legislative framework**

Reference	Requirements
<b><i>Environmental Planning and Assessment Act 1979</i></b>	<ul style="list-style-type: none"> <li>▪ Framework for environmental planning and assessment in New South Wales. Including the requirement for environmental impacts to be considered prior to development approval.</li> <li>▪ Includes requirements for Aboriginal cultural heritage items and places.</li> <li>▪ Local government areas (LGAs) prepare local environmental plans (LEPs) and development control plans in accordance with the Act to provide guidance on the level of environmental assessment required.</li> <li>▪ Part 5.1 of the Act applies to state significant infrastructure.</li> <li>▪ Under Part 5.1 section 115ZG, a range of approvals are not required, including Section 90 AHIP. Once environmental assessment requirements are issued by the Director-General of Planning and Infrastructure for a Part 5.1 project, any investigative or other activities complying with the requirements are also taken to be part of the project approval.</li> </ul>

Reference	Requirements
<p><b><i>National Parks and Wildlife Act 1974</i></b></p>	<ul style="list-style-type: none"> <li>■ Administered by the OEH.</li> <li>■ Serves to protect Aboriginal objects and Aboriginal places in NSW.</li> <li>■ Under the terms of the <i>National Parks and Wildlife Act 1974</i>, any person who harms an Aboriginal object is guilty of an offence.</li> <li>■ An Aboriginal object (s5) is defined as: ‘any deposit, object or material evidence (not being a handicraft for sale) relating to Aboriginal and non-European habitation of the area that comprises New South Wales, being habitation both prior to and concurrent with the occupation of that area by persons of European extraction, and includes Aboriginal remains.’</li> <li>■ An Aboriginal place is an area that has been declared by the Minister as a place of special significance for Aboriginal culture. It may or may not contain physical Aboriginal objects.</li> <li>■ Aboriginal heritage information system (AHIMS) – Register for identified Aboriginal objects or places.</li> <li>■ An AHIP is needed to undertake a number of activities, relevant to development are those issued under section 90 of the Act (though the project is exempt from applying for AHIPs under Part 5.1 section 115ZG of the <i>Environmental Planning and Assessment Act 1979</i>).</li> <li>■ AHIP applications must be submitted and approved by the OEH.</li> <li>■ New procedures that accompany the <i>National Parks and Wildlife Amendment Act 2010</i> include, the Due Diligence Code of Practice for the Protection of Aboriginal Objects in New South Wales 2010, the Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010, and the Code of Practice for Archaeological Investigation of Aboriginal Objects in NSW 2010.</li> </ul>
<p><b><i>Due Diligence Code of Practice for the Protection of Aboriginal Objects in New South Wales 2010</i></b></p>	<ul style="list-style-type: none"> <li>■ The <i>National Parks and Wildlife Act 1974</i> provides that a person who exercises due diligence in determining that their actions will not harm Aboriginal objects has a defence against prosecution for the strict liability offence if they later unknowingly harm an object without an AHIP. A due diligence code of practice has been developed to guide proponents on how to take due diligence and whether or not they should apply for an AHIP.</li> <li>■ Provisions relating to the due diligence system are effective from 1 October 2010.</li> </ul>
<p><b><i>Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010 (ACHCRP)</i></b></p>	<ul style="list-style-type: none"> <li>■ Establishes the requirements for consultation (under part 6 of the <i>National Parks and Wildlife Act 1974</i>) with Aboriginal stakeholders as part of the heritage assessment process to determine potential impacts of proposed activities on Aboriginal objects and places and to inform decision making for any application for an AHIP.</li> <li>■ The ACHCRP comprises 4 stages with associated timeframes which must be adhered to:             <ul style="list-style-type: none"> <li>- <b>Stage 1</b> – Notification of project proposal and registration of interest (14 days from date letter sent to register as a registered Aboriginal party).</li> <li>- <b>Stage 2</b> – Presentation of information about the proposed project (set up Aboriginal focus group [AFG] meetings, prepare info, etc).</li> <li>- <b>Stage 3</b> – Gathering information about cultural significance (28 days for registered Aboriginal parties to provide a review and feedback to consultants’ methodology).</li> <li>- <b>Stage 4</b> – Review of draft cultural heritage assessment report (registered Aboriginal parties have 28 days from sending of the report to make a submissions).</li> </ul> </li> </ul>

Reference	Requirements
<p><b><i>Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales 2010</i></b></p>	<ul style="list-style-type: none"> <li>■ The Code sets out the detailed requirements for archaeological investigations of Aboriginal objects in NSW for activities that require assessment under Part 4 or Part 5 of the <i>Environmental Planning and Assessment Act 1979</i>. An AHIP to undertake test excavation is not required if complying with this Code, as test excavations complying with this Code are excluded from the definition of harm to an Aboriginal object.</li> <li>■ The Code sets out in detail:               <ul style="list-style-type: none"> <li>- Minimum qualifications for anyone undertaking archaeological investigation under the Code in NSW.</li> <li>- Assessment steps required to be undertaken for all archaeological investigation.</li> <li>- Assessment steps that may be required to be undertaken to adequately characterise the Aboriginal objects being investigated.</li> </ul> </li> </ul> <p>The Code must be used for investigation that is likely to result in an AHIP application. However, once the DP&amp;I Director-General's environmental assessment requirements are issued, the project is exempt from the requirement to obtain an AHIP and hence also this code.</p>
<p><b><i>Native Title Act (NSW) 1994</i></b></p>	<ul style="list-style-type: none"> <li>■ The NSW <i>Native Title Act 1994</i> was introduced to ensure that the laws of NSW are consistent with the Commonwealth <i>Native Title Act 1994</i>. It validates past and intermediate acts which may have been invalidated because of the existence of native title.</li> </ul>
<p><b><i>Aboriginal Land Rights Act (NSW) 1983</i></b></p>	<p>The <i>Aboriginal Land Rights Act</i> recognises the rights of Aboriginal people in New South Wales and provides a vehicle for the expression of self-determination and self-governance.</p> <p>The <u>purposes</u> of the Act are:</p> <ul style="list-style-type: none"> <li>■ To provide land rights for Aboriginal persons in New South Wales,</li> <li>■ To provide for representative LALCs in New South Wales,</li> <li>■ To vest land in those LALCs,</li> <li>■ To provide for the acquisition of land, and the management of land and other assets and investments, by or for those LALCs and the allocation of funds to and by those LALCs,</li> <li>■ To provide for the provision of community benefit schemes by or on behalf of those LALCs.</li> </ul>
<p><b><i>Aboriginal and Torres Strait Islander Heritage Protection Act 1984</i></b></p>	<ul style="list-style-type: none"> <li>■ Protects Aboriginal cultural property in a wider sense and includes any places, objects and folklore that “are of particular significance to Aboriginals in accordance with Aboriginal tradition”.</li> <li>■ The Act may apply to contemporary Aboriginal cultural property as well as ancient sites.</li> <li>■ The responsible Minister may make a declaration under Section 10 of the Act in situations where state or territory laws do not provide adequate protection of heritage places.</li> </ul>
<p><b><i>Environment Protection and Biodiversity Conservation (EPBC) Act 1999</i></b></p>	<ul style="list-style-type: none"> <li>■ The EPBC Act includes provisions to protect matters of national environmental significance and Commonwealth land. Lists and registers made under the Act include:               <ul style="list-style-type: none"> <li>- A National Heritage List of places of national heritage significance.</li> <li>- A Commonwealth Heritage List of heritage places owned or managed by the Commonwealth.</li> <li>- Management of the Register of the National Estate.</li> </ul> </li> </ul> <p>An independent expert body, the Australian Heritage Council, advises the Minister on the listing and protection of heritage places.</p>

# PUBLIC

Woolgoolga to Ballina Pacific Highway Upgrade  
Aboriginal Heritage Assessment – Iluka Road to Woodburn  
Volume 1: Cultural Heritage Assessment Report

Reference	Requirements
<b><i>Native Title Act 1993</i></b>	<ul style="list-style-type: none"><li>■ Recognises and protects native title, and provides that native title cannot be extinguished contrary to the Act.</li><li>■ National Native Title Tribunal is a Commonwealth Government agency set up under this Act and mediates native title claims under the direction of the Federal Court of Australia.</li><li>■ The National Native Title Tribunal maintains the following registers:<ul style="list-style-type: none"><li>- National Native Title Register.</li><li>- Register of Native Title Claim.</li><li>- Unregistered claimant applications.</li><li>- Register of Aboriginal land use agreements.</li></ul></li></ul>
<b><i>Declaration on the Rights of Indigenous Peoples</i></b>	<ul style="list-style-type: none"><li>■ The Declaration makes statements regarding the rights of Indigenous peoples, and expectations of States' roles in this. This includes, in Article 11, that Indigenous peoples have the right to 'maintain, protect and develop past present and future manifestations of their cultures', including archaeological sites. The Declaration is a non-binding instrument, but there is some discussion that it may be a reflection of customary international law, which would bind States to the provisions.</li></ul>

## 3. Consultation

### 3.1. Consultation and assessment process

Aboriginal stakeholder engagement and involvement has been important for the identification of Aboriginal cultural values of the project. This chapter details the consultation process used for the project between Iluka Road and Woodburn. This includes the identification of registered Aboriginal parties and the nature of Aboriginal stakeholder consultation and involvement in the assessment process.

#### 3.1.1. Overview of consultation

In summary, the consultation undertaken to date has followed relevant government and RMS consultation guidelines. However, consultation for this project has been undertaken over a long period and consequently has occurred under several consultation frameworks.

The relevant frameworks are:

- Initial consultation began in 2005, with key stakeholders as part of the route options investigation to select a preferred route for Iluka Road and Woodburn (Collins 2008).
- Following the introduction of the Interim Community Consultation Requirements for Applicants (DECC 2005), updates to the consultation process (namely advertising for interested stakeholders) were undertaken to generally comply with these requirements. This occurred part way through the options assessment (Collins 2008).
- In 2010 when the environmental impact assessment for the project commenced, the Roads and Traffic Authority (now RMS) proceeded to bring the consultation process up to date with the Aboriginal Cultural Heritage Consultation Requirements for Proponents (Department of Environment, Climate Change and Water [DECCW] 2010), including re-advertising and notifying potential interested parties.

In the intervening period from 2010, the PACHCI 2011 was revised and this required some further updates so that the consultation complied with PACHCI.

The Director-General of the Department of Planning and Infrastructure has issued environmental assessment requirements for the project Table 1-1, which include assessment of impacts to Aboriginal heritage, and mitigation and management measures to be generally consistent with the Draft Guidelines for Aboriginal Cultural Heritage Impact Assessment and Community Consultation (DEC 2005). These guidelines have now been superseded by the Aboriginal Cultural Heritage Consultation Requirements for Proponents (ACHCRP) (DECCW 2010), which are followed in this assessment. As the 2010 and 2005 consultation requirements are broadly similar (with the 2010 requirements being generally more rigorous), this assessment remains consistent with the Draft Guidelines for Aboriginal Cultural Heritage Impact Assessment and Community Consultation (DEC 2005), and consequently the Director-General requirements. The Director-General requirements also require consultation with local Aboriginal land councils and Aboriginal stakeholders relevant to the project; the project also complies with this requirement.

It should be noted that there are no Native Title holders within the boundary of the project, as Native Title holders have specific rights in relation to cultural heritage. Several claimants exist for the project, see below for more discussion on this.

Relevant guidelines and the consultation process are detailed below.

## 3.2. Consultation and assessment requirements

### 3.2.1. Roads and Maritime Services consultation procedure

Consultation with registered Aboriginal parties followed the process described in the RMS PACHCI (RMS 2011). This aimed to ensure that registered Aboriginal parties had the opportunity to contribute to the assessment:

- The development and design of the cultural heritage assessment methodologies.
- The identification of Aboriginal heritage constraints to be considered within the design.
- The development of recommendations for the management of archaeological sites within the boundary of the project.

Consultation for the project between Iluka Road and Woodburn is being undertaken up to and including Stage 3 of the 2011 PACHCI procedure for projects assessed under Part 5.1 of the *Environmental Planning and Assessment Act 1979*. The stages of PACHCI are:

- Stage 1 – Internal RMS assessment to identify key environmental issues.
- Stage 2 – Further assessment and site survey, with an archaeologist and specific Aboriginal stakeholders to assess the project's potential cultural heritage impacts.
- Stage 3 – Where Stages 1 and 2 lead to the preliminary view that harm to Aboriginal objects or places is likely to occur, then formal consultation must be undertaken and a cultural heritage assessment report prepared. This may also include sub-surface testing where required.
- Stage 4 – Implement project mitigation measures (eg salvage) in accordance with project approval.

#### 3.2.1.1. Consultation requirements for proponents

The ACHCRP replace the Interim Community Consultation Requirements for Applicants (DEC 2005) and Guidelines for Aboriginal Cultural Heritage Impact Assessment and Community Consultation. These requirements apply to all AHIP applications submitted after 12 April 2010. This project does not require any AHIPs, as it is being assessed under Part 5.1 of the *Environmental Planning and Assessment Act 1979*; consequently, these requirements do not strictly need to be applied. The consultation and assessment process for this project was commenced prior to ACHCRP (DECCW 2010). Therefore, a number of updates were undertaken to ensure all relevant Aboriginal stakeholders were included in the consultation process and also to transition the consultation process from the obsolete requirements to the new and current requirements.



The ACHCRP includes a process for the notification and registration of interested stakeholders, preparation for the Aboriginal cultural heritage assessment and the drafting, review and finalisation of an Aboriginal cultural heritage assessment report.

## 3.3. Previous Aboriginal community consultation

### 3.3.1. Aboriginal focus groups 2005 - 2006

The project between Iluka Road and Woodburn of the Pacific Highway Woolgoolga to Ballina upgrade project has been subject to numerous investigations at various stages, such as during route selection and previous development projects. During the route selection stages, Aboriginal stakeholders were consulted at AFGs with regard to potential Aboriginal cultural heritage issues.

The studies for the Iluka Road to Woodburn development project commenced in 2007, with an AFG held in June 2007 as detailed in Table 3-1.

**Table 3-1 AFG meetings held for Iluka Road to Woodburn route options investigations**

Aboriginal focus group meetings	Dates
Iluka Road to Woodburn	13 June 2007

Site officers nominated to represent the AFG were invited to attend fieldwork activities and accompanied the archaeologists during the survey period. AFG stakeholders were provided with a draft of the cultural heritage assessment for review and comment.

Details of the consultation record are provided in Volume 2. The following Aboriginal stakeholder organisations were invited to attend the Iluka Road to Woodburn AFGs for the route options investigations prior to 2010:

- Birrigan Gargle Local Aboriginal Land Council (LALC).
- Bandjalang People (2) Native Title Group.
- Bogal LALC.
- Jali LALC.
- Ngulingah LALC.
- Burra:way Wa:jad Traditional Owners Group.
- NSW Aboriginal Land Council.
- Yaegl LALC and Native Title Claimants.

## 3.4. Current consultation activities

### 3.4.1. Methodology

The consultation strategy adopted in 2010 was to ensure continuity from previous consultation. The primary aims of the current consultation strategy were to:

- Re-engage stakeholders who had not been contacted since the route options investigation AFGs in 2007.
- Transition to the ACHCRP process.
- Inform registered Aboriginal parties that RMS has now selected a route and that assessment is now in concept design phase, rather than route options assessment.

Where possible, the RMS Aboriginal Cultural Heritage Advisor with knowledge of the consultation from Iluka Road to Woodburn attended AFGs. The current phase of consultation involved:

- Notification (including advertisement) for stakeholder registration for the AFG.
- Registration of registered Aboriginal parties for the AFG.
- Holding AFG meetings.
- Undertaking archaeological survey and sub-surface test excavations with the Aboriginal site officers nominated in AFG meetings.
- Providing assessment methodologies and statements of findings to the AFG and requesting comments.
- Providing stakeholders with a draft CHAR for comment (*Pending*).
- Incorporating comments received on the CHAR into the final report (*Pending*).

In addition to the AFG meetings, consultation with nominated Aboriginal site officers was incorporated as part of the archaeological survey. Typical items discussed were:

- Options for mitigation of impact to Aboriginal sites and PADs.
- Potential significance of Aboriginal sites.
- Information pertaining to any Aboriginal cultural sites.
- Previous survey coverage and findings.

### 3.4.2. Aboriginal focus groups 2010 - 2012

Over the course of undertaking this Aboriginal cultural heritage assessment, a series of AFG meetings were held to ensure stakeholders were meaningfully engaged and had an opportunity to provide input and comment on the process.

Table 3-2 provides dates for AFG meetings held under this round of consultation. The minutes of these AFG meetings are provided in Appendix E.

**Table 3-2 Aboriginal focus group meetings held for Iluka Road to Woodburn 2010 - 2012**

Aboriginal focus group meetings	Dates
AFG 1	20 August 2010
AFG 2	14 September 2010
AFG 3	21 October 2010
AFG 4	6 October 2011
AFG 5	14 December 2011

Aboriginal focus group meetings	Dates
AFG 6	26 June 2012

For AFG 1, a background to the project was presented to the group. Discussions were held over large-scale plans showing the project design boundaries, previously surveyed areas and registered Aboriginal sites and PADs. A separate plan for each AFG relevant only to their area was provided at the meetings. The primary aims of the first round of AFG meetings were to:

- Explain the concept design phase of project.
- Inform the Registered Aboriginal parties that further targeted archaeological survey was proposed along the boundary of the project (following identification of gaps in survey coverage) and present the methodology for this survey.
- Request Aboriginal site officer assistance with that survey (following the RMS procedures for engagement).
- Discuss any issues arising from the presentation and discussion.

Two AFG meetings were held after completion of the field survey. The primary aims of these were to:

- Present the results of the archaeological survey.
- Discuss the significance of any new Aboriginal cultural heritage sites recorded within the boundary of the project.
- Discuss potential mitigation strategies for sites recorded in the boundary of the project.
- Present the archaeological and cultural methodologies for assessment of PADs in the boundary of the project.

AFG 4 was held prior to sub-surface testing. The primary aims of this meeting were to:

- Discuss the sub-surface testing methodology.
- Inform interested stakeholders on the site officer nomination process.

After the majority of the sub-surface testing program had been completed AFG 5 was held. The primary aims of this AFG meeting were to:

- Present the results of the sub-surface testing program.
- Discuss the significance of the Aboriginal cultural heritage sites recorded within the boundary of the project.
- Discuss management recommendations, including the development of salvage and protection requirements.

Following completion of the draft CHAR and to commence the review period of the CHAR, AFG 6 was held. In this AFG:

- The summary results and recommendations of the CHAR were presented to stakeholders.

- Comments on the CHAR and recommendations were also provided by stakeholders.

### 3.4.3. Notification, identification and registration of stakeholders

Letters were sent to a number of agencies on 19 October 2010 with a closing date of 3 November 2010, seeking names of Aboriginal people who may have an interest in the project and who hold knowledge relevant to determining the cultural significance Aboriginal objects and/or places. These agencies were

- The Office of the Registrar of the *Aboriginal Land Rights Act 1983*.
- OEH.
- Relevant LALCs.
- Relevant local councils.
- The National Native Title Tribunal.
- Native Title Services Corporation Limited.
- Northern Rivers Catchment Management Authority.

The OEH nominated 11 potential stakeholders. Letters were sent on the 11 November 2010 to those nominated stakeholders seeking registration of interest. The closing date for registration was 2 December 2010 with an AFG scheduled for 8 December 2010. Stakeholders were made aware of this meeting date as they registered, and were followed by a formal invitation two weeks prior to the meeting (approximately 25 November 2010).

Advertisements appeared in November 2010 in the following publications:

- *The Northern Star* (November issue).
- *Ballina Shire Advocate* (11 and 25 November).
- *National Indigenous Times* (11 and 25 November).
- *Deadly Vibe Magazine* (November issue).
- *In Vibe Magazine* (November issues).
- *The Koori Mail* (3 and 17 November).

During the first round of AFG meetings, it was noted that additional Native Title claimants may exist within the boundary of the project. A Native Title search was conducted in September 2010 (refer to Table 3-3) and new Native Title claimants identified as stakeholders were included in any subsequent consultation. Native Title searches were also conducted in February and April 2012 to check for any new groups; no new groups were identified.

**Table 3-3 Native Title claimants relevant to Iluka Road to Woodburn; no Native Title holders exist for the project Sections 6 to 8**

Aboriginal focus group	Project sections	Native Title group
Wells Crossing to Iluka Road Iluka Road to Woodburn Woodburn to Ballina	8 – 11	Bandjalang People (2)

Aboriginal focus group	Project sections	Native Title group
Iluka Road to Woodburn Woodburn to Ballina	8 – 11	Bandjalang People (1)

### 3.4.3.1. Summary of issues raised at Aboriginal focus group meetings

The following issues were raised at the first round of AFG meetings:

- Concerns over the restrictions placed on pay rates by the RMS PACHCI document.

The following issues were raised at the post-survey AFG meetings:

- At the Iluka Road to Woodburn AFG, Lois Cook (Burabi Aboriginal Corporation) raised concerns regarding the route north of Woodburn which passes through the Cooks Hill area and will directly impact on a massacre site; and the lack of consultation with Aboriginal stakeholders during the design phase. Kate Wiggins (RMS) stated that there would be an opportunity for Aboriginal stakeholders to voice their concerns after the formal registration of stakeholders for this section of the project.
- Rosemarie Vesper (Birrigan-Gargle LALC) raised concerns regarding the removal of artefacts from sites, rather than reburial. Graham Purcell (RMS) replied that a consensus on this between stakeholders would have to be achieved and that if not they would be reburied on site.
- Groups expressed a desire to survey ancillary areas outside the corridor and Marcus Ferguson (Jali LALC) said that some mythological sites may be impacted, but further discussion would be required to determine if this was the case. Graham Purcell stated that all ancillary areas outside the current boundary of the project would be inspected and/or surveyed with Aboriginal site officers.
- Lance Manton (Bogal LALC) expressed frustration with the planning process and stated that cultural heritage legislation does little to assist with this.
- Lance Manton (Bogal LALC) expressed a desire for monitoring to take place during the works along the corridor and asked for cultural heritage awareness signage.

### 3.4.4. Participation in fieldwork

During fieldwork, nominated Aboriginal site officers were engaged to assist with the identification and investigation of sites and PADs during survey and sub-surface test excavations, as well as to identify any cultural places. Site officers in attendance during those surveys are detailed in Table 3-4.

Notable comments from site officers during that fieldwork included:

- From Jali and Yaegl site officers, details regarding nature, locations and story of Derrangan spirit and connections in landscape, between tangible and intangible cultural heritage sites and

important landscape features, and potential cultural significance of this (incorporated into Chapter 5)

- From site officers, details of importance and sensitivity of landforms in the respective areas (incorporated into Chapter 5) and discussion of type, scope and methodology for potential further investigation (eg survey, sub-surface test excavation, etc) (incorporated into Volume 2).
- From Jali and Burabi site officers, discussion of potential significance of archaeological sites and sensitivity of PADs recorded during the field survey.

The above described sites and places are detailed further in section 5.5.

**Table 3-4 Site officers participating in field assessments**

Organisation	Name	Role	Dates of participation
Yaegl LALC (also Yaegl People Native Title claim)	Mark Laurie	Trainee Aboriginal Site Officer	25-27 August 2010
Yaegl LALC (also Yaegl People Native Title claim)	Ferlin (Lee) Laurie	Senior Aboriginal Site Officer	24-27 August 2010 4-6 October 2011
Yaegl LALC (also Yaegl People Native Title claim)	Gilbert Laurie	Aboriginal Site Officer	12–18 December 2011
Yaegl LALC (also Yaegl People Native Title claim)	Dale Mercy	Senior Aboriginal Sites Officer	4-6 October 2011
Yaegl LALC (also Yaegl People Native Title claim)	Shane McLeay	Aboriginal Site Officer	4-6 October 2011
Birrigan Gargle LALC (also Yaegl People native title claim)	Fox Laurie	Senior Aboriginal Site Officer	24-27 August 2010 4 October 2011
Birrigan Gargle LALC (also Yaegl People Native Title claim)	Ronald Williams	Trainee Aboriginal Site Officer	25-27 August 2010
Birrigan Gargle LALC (also Yaegl People native title claim)	Malcolm Brown	Aboriginal Site Officer	4-6 October 2011
Birrigan Gargle LALC (also Yaegl People native title claim)	Kurtis Laurie	Aboriginal Site Officer	4-6 October 2011

Organisation	Name	Role	Dates of participation
Jali LALC	Dean Bolt	Senior Aboriginal Site Officer	24-25 August 2010 2-4 August 2011 4 October 2011 19–23 December 2011 7 March 2012
Jali LALC	Marcus Ferguson	Senior Aboriginal Site Officer	23-24 August 2010 2-4 August 2011 4 October 2011 12–23 December 2011 7 March 2012
Bogal LALC	Steven Williams	Senior Aboriginal Site Officer	27 August 2010
Bogal LALC	Daryl Knight	Senior Site Officer	4 October 2011 12–18 December 2011
Bogal LALC	Grant Wilson	Aboriginal Site Officer	12–18 December 2011
Burabi Aboriginal Corporation	Lois Cook	Senior Aboriginal Site Officer	2-4 August 2011 7 March 2012
Burabi Aboriginal Corporation	Dwaine Cook	Trainee Aboriginal Site Officer	2-4 August 2011 12–18 December 2011 7 March 2012
Burabi Aboriginal Corporation	Anthony Cook	Aboriginal Site Officer	12–18 December 2011
Bandjalang Native Title Group	Doug Wilson	Aboriginal Site Officer	12–18 December 2011
Bandjalang Native Title Group	Daniel Wilson	Aboriginal Site Officer	12–18 December 2011

### 3.4.5. Aboriginal stakeholder comment on cultural heritage assessment report

The final draft of this CHAR and associated archaeological assessment and appendices were provided to stakeholders for comment on 26 June 2012. Comments and recommendations made within 8 weeks of this date by Aboriginal stakeholders are summarised in Table 3-5 and included in full in Appendix E. Changes requested and based on comments were considered and were incorporated into this CHAR where possible.

**Table 3-5 Comments received from Aboriginal stakeholders**

Registered stakeholder group	Received comments?	Comments
Birrigan Gargle LALC	Yes	No concerns with the current recommendations and they are very happy with the CHAR. It has been presented to the Board and they were satisfied with CHAR. Norma (CEO) has been to most of the AFGs and the site officers had participated in the fieldwork; the Board were satisfied with the outcomes.
Jali LALC	Yes	No concerns with the current recommendations.
Yaegl Native Title Claimants Group	Yes	Have provided comments through other channels, solicitor said this was through the Land Councils. <sup>2</sup>
Burra:way Wa:jad Traditional Owners Group	No (did not view CHAR)	CHARs were returned ('not at this address') and the phone number was not connected.
Ngulingah LALC	Yes	Agree with the recommendations provided by the other groups in the area.
Yaegl LALC	Yes	No concerns with the current recommendations. They acknowledge that they participated in the fieldwork and the recommendations for the Wells Crossing to Iluka Road section.
Bogal LALC	No	No comments received.
Bandjalang Native Title Claimants	Yes	The Bandjalang NT claimants have ratified the recommendations for IR2W2, IR2W3 and IR2W4.

## 3.5. Consultation with government agencies

Consultation was undertaken with government agencies throughout the project, including with the DP&I to gain Director-General's requirements.

Regular consultation was undertaken with OEH/Environmental Protection Agency (EPA) to ensure alignment of values, approach and methodologies. Regular meetings were held to discuss the approach proposed, and requesting comments, particularly in regards to transitioning from previous requirements to current requirements (eg ACHCRP, and the Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales [OEH 2010]). The methodologies and research design for proposed investigations were discussed with OEH during these meetings, prior to their implementation. Meetings also discussed impacts to sites and places and appropriate ways to manage these.

<sup>2</sup> The solicitor from NTSCORP Limited was referring to Yaegl LALC and Birrigan Gargle LALC.



## 4. Existing environment

This chapter provides an overview of the land use, cultural, geological conditions that characterise the sections of the project between Iluka Road and Woodburn.

The information provided relates specifically to those factors which affect archaeological site distribution and preservation. Interpretation relating to landforms, geology, soils, and vegetation are made from an archaeological perspective and may not necessarily accord to scientific reports on these subjects. For example, descriptions may be different than that standard to geology and geography.

Land systems are mutually exclusive complexes that contain similar environmental components such as climate, geology, landform, soil and indigenous vegetation (Rowan 1990). Land systems form useful discrete units for describing and analysing the landscape.

### 4.1. Regional context

This review of the existing environment is arranged into land systems in order to build a context for the archaeological assessment. Several land systems occur within the boundary of the project and are summarised in Table 4-1.

**Table 4-1 Summary of land systems within the project**

Project section	Land system	Location within/near the boundary of the project	Specific landscape characteristics
2, 3, 4, 5 and 6	Clarence River Valley	Grafton, Tyndale, Harwood, Iluka and Yamba	The Clarence River flows roughly parallel to the boundary of the project north-easterly direction on the western side, and divides into the subsidiary streams of the North and South Arms south of Grafton. The Boundary of the project intersects the main arm of the Clarence River at Harwood, while the North Arm is crossed at Woombah. The Clarence River floodplain is an undulating plain consisting of low rises, levees, terraces and depressed flood channels, and is made up of Quaternary gravel, silt, alluvium, sand and clay deposits. The Quaternary alluvium may retain archaeological deposits in aggrading landform contexts.

Project section	Land system	Location within/near the boundary of the project	Specific landscape characteristics
6, 7 and 8	Tabbimoble rises	Iluka Road, Evans Head and Trustums Hill	This system occurs between the Richmond Range and the dunes and swamps of the coastal plains (Collins 2008). The topography in the region is comprised of low hills and undulating rises of up to 40 m above sea level, while the lowland areas with elevations of less than 10 m above sea level are made up of alluvial floodplains, including back swamps and drainage channels flowing west to east (Collins 2008).
8, 9, 10, 11	Richmond alluvial plain	Woodburn to Ballina: Richmond River	The coastal ramp forms the eastern edge of the Blackwell Range which extends southwards from the Alstonville Plateau. It also separates the smaller drainage basins lining the western edge of the alluvial plain, and forms the outlying hills around Broadwater (Collins 2005: 8).

#### 4.1.1. Land systems

The Clarence River valley is an expansive, generally flat to undulating valley, and includes many tributaries (such as Shark Creek), meanders and arms of the Clarence River. The Clarence River floodplain consists of soft alluvium of depths between 14 metres and 22 metres, overlying bedrock. sections 3, 4, 5 and part of 6 cross the Clarence River floodplain.

Between the southern end of section 6 and the southern end of section 8, the boundary of the project traverses the Tabbimoble Rises. The Tabbimoble Rises are a system of low hills situated between the Richmond Range and the coastal plains, dunes and swamps. They generally have a relief of between 10 metres and 40 metres above sea level. Natural surface stone is limited to ironstone nodules, fragments of sandstone and siltstone, and occasional quartz pebbles. Potential for quarries and rockshelters in the Tabbimoble Rises is nil, as no such landforms occur (Collins 2008).

Just south of Woodburn in project section 8, the rolling hills grade into Richmond River estuarine alluvial plain deposits, made up of mud overlain by clay, gravel, sand and silt. The estuarine nature of this area is reflected in the dominance of alluvial soils, with less stable, waterlogged soils occurring on the alluvial plains and low-lying areas, while more stable soils and clays occur on higher and undulating ground, and are characterised by drainage depressions and broad crests. Much of the area to the south of Woodburn consists of quartz, sandstone and shale, with thin beds of finer sediments (Collins 2005: 9). The Richmond River alluvial plain intersects the boundary of the project in the northern part of section 8.

#### 4.1.2. Geology and geomorphology

South of the Richmond River the surface sediments consist of the Pleistocene coastal plain, a Quaternary sand, silt and clay unit in barrier dune formations trending east–west. The Pleistocene coastal plain with its sand, silt and clay sediments underlies the Broadwater National Park, south of the Clarence River.

The Beenleigh Block bedrock is the basement unit in the region. This consists of grey-green coarse grained sandstone and slate, which has been slightly metamorphosed. Local quartz veins have also been altered by pressure and temperature. The bedrock can exhibit turbidite facies, a layering of sediments consistent with deep marine deposition in the Carboniferous period, approx 350 million years ago. Basement rocks of the Beenleigh Block outcrop in several small areas south of the Richmond River. These resources have been identified and utilised at local quarries such as Cooks Hill.

North of the Richmond River, the boundary of the project follows the eastern boundary of the Blackwell Ranges, which are determined by the outcropping bedrock. The boundary of the project then traverses a series of Holocene alluvial deposits on the floodplain from Saltwater Creek to Ballina. The more successful farming areas south of Woodburn are underlain by mud, silt and clay of the Holocene estuarine plain, a younger landscape deposited onto the Pleistocene landscape.

The stone most frequently quarried in NSW by Aboriginal people was silcrete, with chert, quartz and quartzite extraction also being relatively common (Department of Primary Industries [DPI] 2007). In the Woodburn region, it is likely that the most frequently occurring raw material types will be chert, chalcedony and quartz (either cloudy or crystalline).

Chert is a fine-grained silica-rich microcrystalline sedimentary rock. Chert usually forms as a nodule in a sedimentary rock such as a limestone, which has been subject to pressure or temperature change after its initial deposition. Chalcedony is similar to chert in composition. However, in microscopic view it will have a more fibrous growth habit.

Stone was mined from boulders, exposed veins or blocks, conglomerates and from deposits of pebbles or cobbles and gravel. Mining was by extraction from surface deposits and by excavation below the surface (DPI 2007).

### 4.1.3. Vegetation

Before European colonisation, the native vegetation of the project largely comprised dense gallery rainforest stands, which covered the Clarence and Richmond River floodplains (Collins 2005: 9). Much of this vegetation has been cleared for timber milling, cattle grazing and agriculture, particularly for sugar cane plantations. Some areas have been more heavily cleared than others. The rainforest of the Clarence and Richmond River Valley floodplains, for example, has been heavily disturbed due to these activities more than other areas. The timber milling industry also led to the clearing of natural vegetation.

At present, tall, open hardwood forests occur mainly within the State Forests and National Parks and Nature Reserves along the coast, such as the Tabbimoble State Forest. These forests are dominated by species such as grey gum, spotted gum and red mahogany, with acacia shrubs forming a dense understorey. These forests also occur on areas of Crown land and private land that have not been subject to clearing (Collins 2008). The drainage depressions and alluvial plains also support tall swamp vegetation with broad-leaved paperbark (Collins 2008: 5).

## 4.2. Ethnographic record

### 4.2.1. Aboriginal tribal boundaries

A total of three Aboriginal language groups are represented along the Iluka Road to Woodburn sections of the project:

- Yaegl (Yaygir).
- Nyangbal.
- Bundjalung.

According to Crowley (1978), Yaygir (Yaegl) and Gumbaynggir (Yaegl's southern neighbours) originated from the same proto-language to become distinct sub-groups on their own. As this tribal group covered such a large, environmentally diverse area it is probable that the language contained three or four dialects and supported a population of between 1200 and 1500 people (Hoddinott 1978).

The lower Clarence River was occupied by Yaegl (Yaygir) Aboriginal people, who were the southern neighbours of the Bundjalung. The Clarence River separated these two Aboriginal groups who were associated with distinctly different languages (Tindale 1940; Crowley 1978). According to Crowley (1997) this type of sharp linguistic discontinuity could have arisen as a result of different populations moving from the initial river mouth concentrations north and south along the coast and eventually meeting in the middle between the major rivers. On Friday 12 August 1799, Mathew Flinders recorded an Aboriginal settlement at the mouth of the Clarence River (Piper 1982). Flinders described large dome shaped bark huts, baskets, nets and other evidence that suggested that the occupants of the Iluka area pursued a hunting/fishing economy supplemented with vegetable foods.

The Bundjalung inhabited the region north of the Clarence River to the Logan River in south-east Queensland. Speakers of the Nyangbal language group occupied the region east of Bundjalung along the coastal plain and encompassing Ballina.

Prior to European colonisation, about 20 different dialects of the Bundjalung language were spoken north of the Clarence River to the Logan River in southeast Queensland (Collins 2005). The ethnohistoric record suggests that the lower Richmond supported one of the densest Aboriginal populations in Australia (Collins 2005). The Aboriginal population appears to have been concentrated along the coast however densities of up to one person per 2.5 square kilometres have been proposed for the riverine corridor. Gollan (nd cited in Collins 2005) reported that 200 to 300 Aboriginal people would gather at Woodburn for a tribal fight and corroboree. In the foothills of the coastal ramp, which lacked resources, populations were smaller approximately one person per five square kilometres (Pierce 1971).

#### **4.2.2. Social organisation**

Peterson (1976) described Aboriginal society as being comprised of a hierarchy of organisational levels and groups with fluid boundaries between them. The smallest group in the hierarchy is the family comprised of a man with one or more wives, their children and some of their parents. The second level of the hierarchy consisted of bands, small groups consisting of members of several nuclear families who conduct hunting and gathering tasks together for most of the year. The third level of the hierarchy consists of regional networks which comprise a number of bands. Members of these regional networks usually have beliefs in a common language dialect and assemble for specific ceremonies. The 'tribe' is the next highest unit which is recognised as a linguistic unit with flexible territorial boundaries. The highest level of the hierarchy is the 'cultural area', which consists of groups who share certain cultural characteristics, such as initiation ceremonies and closely related languages.

### 4.2.3. Settlement patterns

Although Aboriginal groups remained within their own territories, long distance travel was often undertaken to attend social and ceremonial events and to exchange goods between the north coast river systems (Collins 2005). Further inland, shifting camp seems to have been frequent, occurring as often as monthly. Camps were usually constructed in dense sheltered scrub and consisted of bark shelters sufficient to accommodate a few occupants from the rigours of the weather. At Woodburn, there were certain places where large camps were established near good fishing localities or areas of abundant resources (Gollan nd cited in Collins 2005). However, according to Coleman (1982), Aboriginal occupation along the coastal zone was largely sedentary, with people limiting their movements to small territories that could support their subsistence needs.

At the time of European settlement, both the Yaegl and Bundjalung peoples comprised a number of separate, but interrelated groupings, each associated with a specific geographic area (Collins 2008). These groups shared economic resources and ceremonial occasions, traded with one another, intermarried, and spoke a mutually intelligible language. According to Belshaw (1966), the Aboriginal population density ranged from one person per square kilometre on the Richmond coastline, to one person per approximately 50 square kilometres in the escarpment ranges. Early European accounts indicate that no land system was completely abandoned by Aboriginal people at any time of the year.

### 4.2.4. Material culture

The majority of the region's material culture (shields, spears, boomerangs, clubs, digging sticks, canoes, containers and woven nets and bags) were made from wood or other vegetative material that is rarely recognisable in the archaeological record. A limited assemblage of artefacts more conducive to presentation has been recorded, including hafted stone hatchets used to cut possums and bees nests from trees, stone knives used in scarification and to cut women's hair, slivers of sharpened shell for sundry cutting tasks, bone tools to soften and engrave designs on skin rugs and bone needles used when sewing skins together (Bundock 1898; Dawson 1935; Flick 1934).

### 4.2.5. Resources

Ainsworth (1922, cited in Collins 2005) partially reconstructed the traditional Aboriginal resource base and environmental context from which the principal resources originated. Although shellfish and rainforest resources such as yams and flying foxes were regularly consumed, Ainsworth's (1922) description primarily concerns fishing methods. Nets were reportedly used in the narrow and shallow waters of the estuary. In addition, fern and rush roots, birds, marsupials, reptiles, wattle seed, blue flax lily fruit, roots and fibre, grubs, eels, tortoises, and pine rafting resin would also have been utilised (Maiden 1889; Bundock 1898; Bray 1901; Petrie 1904; Flick 1934; Simpson 1956; McBryde 1982; Byrne 1986).

Goods and resources would have been exchanged between Aboriginal groups in the Clarence and Richmond River Valleys. Axes manufactured from greywacke pebbles collected from the mid Clarence River gravels have been recovered at both Woombah and Woodburn, east and north of the study area respectively (Binns and McBryde 1972). Resource exploitation appears to have been undertaken by family groups and often several families would co-operate to form a highly flexible 'band' that would gather and then separate as conditions demanded (Godwin 1990).

A wide variety of mammals, birds, fish and vegetable foods contributed to the Aboriginal diet and all the available habitat types were exploited (Collins 2008). Resources mentioned in early

ethnohistoric sources include koalas, possums, kangaroos, wallabies, echidna, bandicoots, goannas, snakes and various birds, all available in the sub-coastal forests of the Clarence-Richmond divide. Faunal remains recovered at Woombah reveal that Aboriginal people were largely reliant on estuarine foods, such as oysters (McBryde 1982). Although no vegetable products were represented archaeologically, McBryde (1982) suggested that these would have been regularly exploited.

The environment differed greatly before the arrival of non-Aboriginal people to the region. Broad rivers flowed through thickly forested plains with occasional grasslands and densely treed mountain ranges (Hoff 2010). Much of the region from the Logan River to the mouth of the Clarence River was thickly forested particularly along the fertile lowland flats that bordered the winding rivers as they flowed to the sea (Hoff 2010). The rainforests "...teemed with animal and bird species..." while networks of paddymelon and wallaby tracks were evident in the undergrowth, and pigeons and other edible birds swarmed the trees (McKenzie-Kelly family cited in Hoff 2010).

#### 4.2.6. Spiritual locations and culture

Initiation ceremonies of the north coast reportedly involved the gradual revelation of sacred information and a corresponding growth in social and economic status (Collins 2005). Bundjalung males passed through at least two degrees of initiation before becoming full members and were permitted to marry. The major initiation ceremonies were undertaken at Bora grounds. Women also reportedly had their own initiation grounds and associated rites (Winterbotham 1983).

Radcliffe-Brown (1929) reported that sacred spots known as 'Djurebil' (also more generically called 'increase sites') were located throughout Bundjalung country. These spots were often marked by a natural feature such as a water-hole or a significant rock or group of trees. Initiated people performed rites at each djurebil within their territory to ensure the maintenance and well-being of the associated species or resource. According to Oakes (1979), Djurebils were 'rogation spots' where the sacred being was ceremonially asked to make a certain natural resource more plentiful.

#### 4.2.7. European and Aboriginal interaction

Rich (1989) identified several stages and themes in the history of contact between Aboriginal people and non-Aboriginal settlers. Initially interaction was reportedly amicable, though degenerated into violent clashes. Aboriginal people were employed as cedar spotters and labourers; however, when cedar supplies diminished, widespread land clearance was conducted along river valleys and further upstream within mountainous localities. Cedar getters travelled by boat up the Clarence River in 1837 and met with friendly Aboriginal locals, whose only previous and amicable interaction had been with convicts and ships crews (Hoff 2010). Initially, Aboriginal people shared the location of large trees with the cedar getters, possibly oblivious to actual intent of the foresters. Interaction between the cedar getters and Aboriginal people reportedly became tense, *The Monitor* claiming that "...these 'drunken sawyers' travelled the river well armed, [and] provoked the Aborigines to reprisals and shot them when the situation became out of hand" (Hoff 2010).

Following the *Robertson Land Act* in 1861, contact between Aboriginal and non-Aboriginal people intensified, which resulted in the systematic dispossession of Aboriginal people from their land. Following the spread of disease and violent resistance, Aboriginal people became reliant on European settlers and were often employed as stockmen, shepherds and servants on grazing properties (Rich 1989). This marked the beginning of the fringe-dwelling period which continued well into the 20th century.

In the latter part of the 19th century, there was a growing concern for Aboriginal people in NSW which resulted in the forming of the Aborigines Protection Association in 1881 (Kuskie 2008). In 1883, the Government established a Board of Protection of Aborigines to achieve a “more systematic and enlightened treatment of Aborigines”. Rural stations were created so that Aboriginal people could remain on tribal territory. In north-eastern NSW, 126 reserves were established between 1883 and 1971 including at Coffs Harbour and Grafton (Burke 1997). Amendments to the *Aborigines Protection Act 1869*, however, allowed the board to forcibly move Aboriginal people onto reserves well away from tribal areas and control all aspects of their lives. Further amendments enabled the board to forcibly remove Aboriginal children from their parents, a practice which was conducted throughout the first half of the 20th century.

### 4.3. Historical land use and current site condition

The north coast of NSW was first explored by Oxley in 1820, with settlement by non-Aboriginal (European) people continuing during the following decades (Byrne 1981). Past and present land use activities within the study area include sand quarrying, flood mitigation schemes, sugar cane production, cattle grazing, agriculture, timber milling and the construction of roads and dwellings. Sand quarrying was previously undertaken within the Broadwater area and the Bundjalung National Park in the north of the project, which has led to the extensive disturbance of the coastal barriers in these areas.

The poor drainage of the alluvial plain has been largely overcome by the implementation of flood mitigation schemes, such as the construction of canals to drain the Tuckean Swamp north-east of Broadwater, and the construction of the Tuckombil Canal between Rocky Mouth Creek and the Evans River in the north of the boundary of the project (Collins 2005: 8). Extensive systems of small drainage channels have also been used to drain areas of the Richmond and Clarence floodplains for sugar cane farming.

The introduction of sugar cane production, cattle grazing and general agricultural practices led to the extensive clearing of much of the original rainforest and eucalypt forests in the boundary of the project. Re-growth areas exist in State Forest and reserves, such as south and west of Woodburn and Iluka, have been largely owned by the State for much of the post-contact period.

The first European settlers in the Richmond River area quickly discovered the fertile alluvial soils were suitable for growing sugar cane and maize. These crops could also be conveniently transported along the Richmond River to processing plants and markets, with the transport of sugar by river only ending in the 1970s. Cane was first introduced to the Wardell area to the north of the boundary of the project in the 1860s, and proved to be a more successful and lucrative crop than others which had been tried in the area, such as wheat and tobacco. The presence of the coast and the warmer climate to the east aided the growth of sugar cane and reduced the incidence of frost, making farming more successful here than in other areas further inland and to the south (Ballina Shire Council 2004). Sugar cane is now grown from Ballina south to Wells Crossing, with a mill at Broadwater.

Cattle have been grazed over parts of the project in both historical and modern times. The opening up of land for free selection in the 1860s and the passing of Land Acts by the NSW Government in the 19th century resulted in the expansion of farming lands. Many of the first farmers were actually timber cutters, who were required to improve their land by constructing buildings and cultivating their land after first clearing it (Ballina Shire Council 2004). Land clearances and general agricultural practices, such as ploughing, have resulted in the modification of large tracts of land throughout the study area.

Cattle farming was preceded in many areas by timber cutters, with cedar being a particularly desirable wood. Cedar-cutters had established themselves near Meerschaum Vale to the north of the boundary of the project, by the 1850s, in order to access cedar stands. The introduction of free selection removed many of the restrictions imposed on timber cutters, and allowed selectors to cut timber on their own land. Timber cutting and milling in the 19th century led to the logging of much of the original vegetation along the floodplains of the Clarence and Richmond Rivers.

The arrival of the cedar cutters and dairy farmers led to the expansion of settlements and other services required to supply the growing populations. Roads were often initially cut by early settlers, such as the timber cutters, and were then expanded by dairy farmers and other settlers who needed to transport goods to and from their homes. Road construction and maintenance later became the responsibility of local councils, with funding for major roads supplied by the New South Wales Government (Ballina Shire Council 2004). The subsequent construction of roads and other forms of transport, as well as residential dwellings and commercial buildings, have disturbed the landscape throughout the study area.

The Pacific Highway has had several alignments around the current highway, and as such, much of the area immediately surrounding the current highway has been disturbed by previous alignments.

The major land use activities associated with the boundary of the project presently are farming and agriculture including beef, wool, sugar cane, soybean and tea production. Other land uses include timber logging, conservation areas such as the State Parks and Forests, and urban land encompassing the larger townships and settlements and their associated commercial activities, such as service stations and caravan and holiday parks.

Figure 4-1 shows a modelled estimate of the accumulated impact on the landscape from post colonisation land-use. This mapping is derived from a DECCW online regional predictive model mapping tool (the Aboriginal Site Decision Support Tool).<sup>3</sup> Areas with high impact (shown in red/orange) are less likely to retain archaeological remains. Areas used for sugar cane farming such as many properties between Woodburn and Ballina around the Richmond River show up on this map in orange. These land uses are subject to relatively high degree of accumulated impact due to more than 100 years of clearing, followed by deep ripping for cane farming. Areas of much lower accumulated impact such as south-west of Woodburn (shown green to blue), include State Forests and National Parks. As can be seen in Figure 4-1, much of the project traverses areas that have been subject to a high degree of accumulated impact. This suggests that less robust site types, such as human remains, shell deposits and scarred trees, are less likely to occur in the areas subject to higher levels of accumulated impact than areas subject to lower levels of impact. It also suggests that more robust site types, such as artefact scatters, are more likely to have lower integrity in the areas subject to higher levels of accumulated impact.

---

<sup>3</sup> Accessible at <http://mapdata1.environment.nsw.gov.au/asdst/default.aspx>; how the Aboriginal Site Decision Support Tool modeling was developed is described at <http://www.environment.nsw.gov.au/licences/AboriginalSitesDecisionSupportTool.htm>



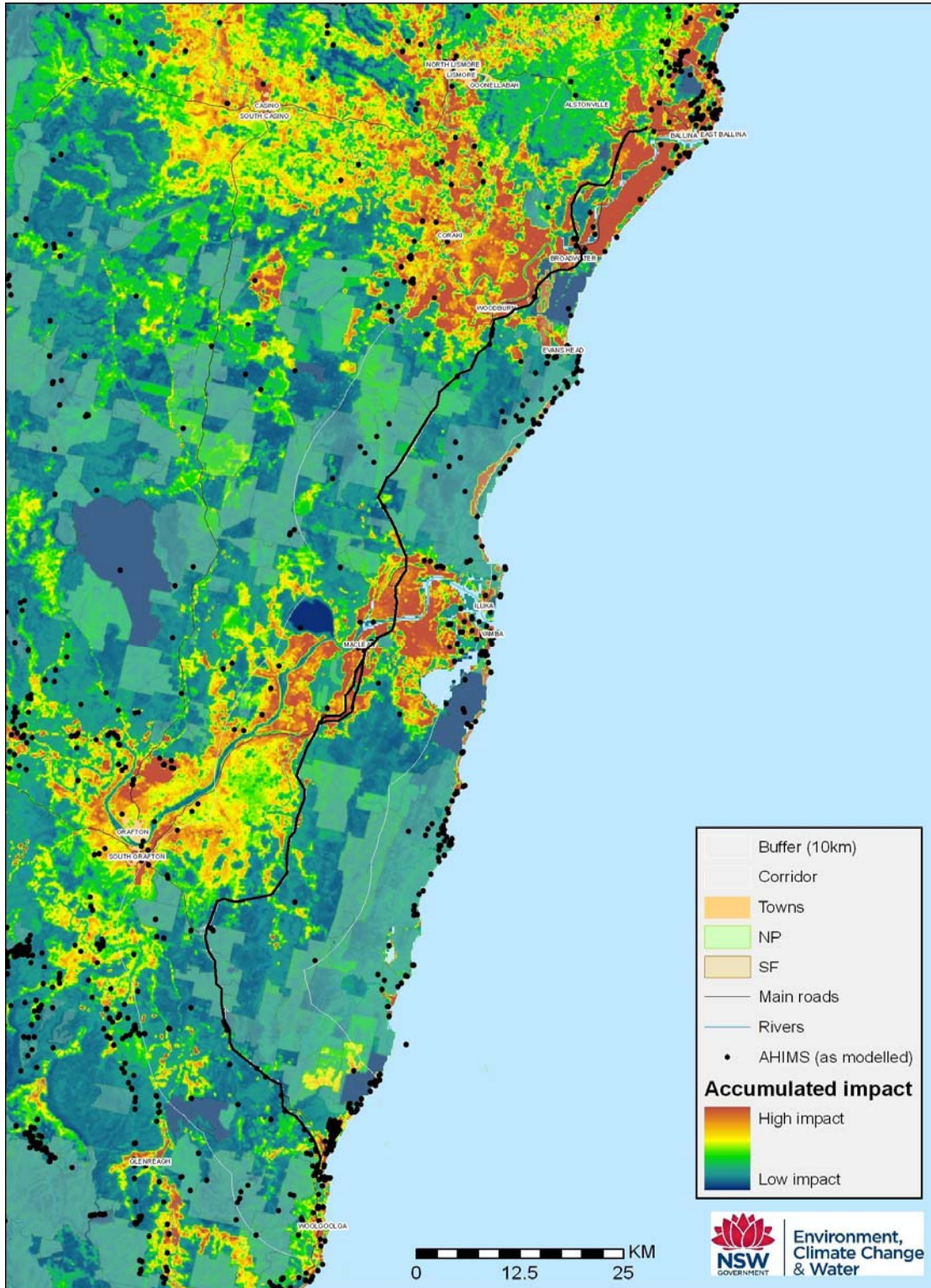


Figure 4-1 Accumulated impact within the boundary of the project from post-colonial land-use

## 4.4. AHIMS register search

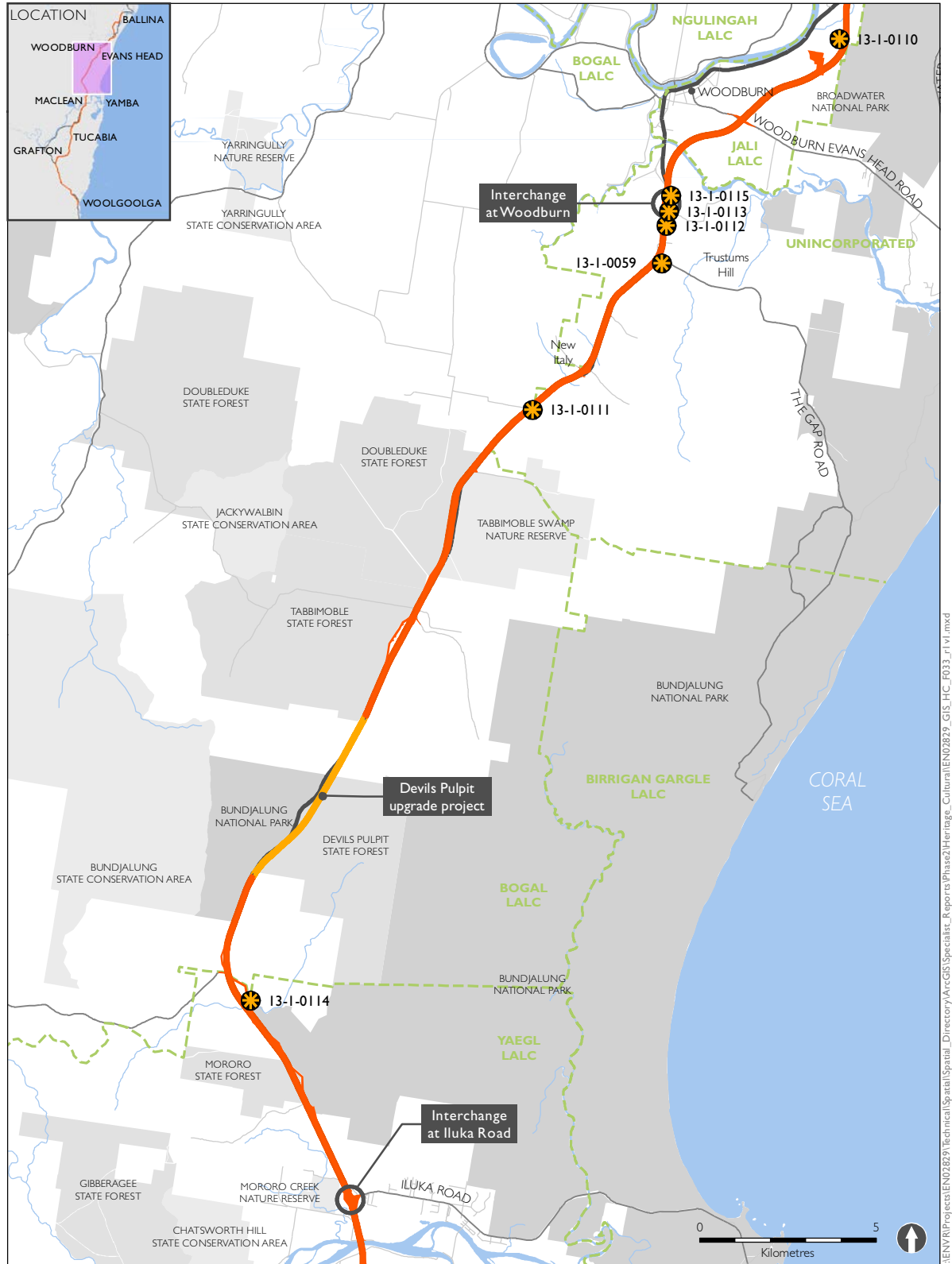
The AHIMS was searched in 2010 and updated in February 2012 for records relevant to the project and surrounds. Seven sites/places were identified (Table 4-2) as relevant to the project between Iluka Road and Woodburn.

**Table 4-2 Listings on AHIMS located within 200 metres of the boundary of the project**

Project section	AHIMS ID	Site name	Easting/northing GDA 94 Zone 55	Site type	Landform	Distance from boundary of the project (metres)
6	13-1-0114	IR2W1	521286E/ 6758271N	Isolated Artefact	Middle Slope	Within boundary of the project
7	13-1-0111	Withheld – <b>see also Section 5</b>	539259E/ 6774964N	Modified Tree (Carved / Scarred)	NA	130
8	13-1-0112	IR2W2	533043E/ 6780169N	Artefact Scatter	NA	Within boundary of the project
8	13-1-0110	C3/2/2	537924E/ 6785447N	Burial	NA	140
8	13-1-0113	IR2W3	533107E/ 6780577N	Isolated Artefact	NA	Within boundary of the project
8	13-1-0059	Saw Pit Creek / New Italy	532906E/ 6779106N	Burial	NA	120
8	13-1-0115	IR2W4	533164E/ 6781024N	Isolated Artefact	NA	Within boundary of the project

## Upgrading the Pacific Highway - Woolgoolga to Ballina Upgrade

Figure 4-2 Iluka Road to Woodburn - Aboriginal heritage sites (registered on AHIMS)



- The project
- Upgrade under construction
- Existing Pacific Highway
- Aboriginal heritage site

## 5. Aboriginal cultural assessment

### 5.1. Introduction

The cultural assessment in this report includes cultural information collected during consultation, survey and sub-surface testing. The Aboriginal cultural assessment was undertaken by Robyn Jenkins, Vanessa Edmonds, and Joseph Brooke.

### 5.2. Methodology

The assessment involved consultation in a number of forms with knowledge holders as identified by the registered Aboriginal parties for the project (see Chapter 3 for further details of consultation). The cultural assessment was based on:

- Reviewing archaeological fieldwork and consultation conducted for the previous development project, by Collins (2008).
- Reviewing literature relevant to the project and surrounding landscape.
- Consultation with elders and knowledge holders for the region during AFG meetings.
- Consultation with elders and knowledge holders for the region outside AFG meetings (eg oral history recording, site visits with Elders).
- Consulting with Aboriginal site officers during field survey regarding Aboriginal objects and cultural values.

The information provided has contributed to an understanding of the cultural value of the broader landscape within which the project is located. Knowledge holders have provided information about the traditional presence of Aboriginal people in the landscape, ceremonial sites and the impact of European land management practices on their traditional land, and subsequently their culture. The cultural assessment identified locations of Aboriginal cultural value within the boundary of the project.

### 5.3. Cultural landscape

The understanding and perception of the landscape expressed by the knowledge holders and the community is an area traversed by an interconnecting network of physical, social and spiritual places. The World Heritage Convention of United Nations Educational, Scientific and Cultural Organisation (UNESCO) define an associative cultural landscape as one which has 'powerful religious, artistic or cultural associations of the natural element rather than material cultural evidence, which may be insignificant or even absent' (UNESCO 1991). The relationship between Aboriginal Australians and the land can often be conceived in spiritual terms rather than primarily in material terms (Andrews *et al* 2006).

Aboriginal cultural knowledge has been defined as:

*Accumulated knowledge which encompasses spiritual relationships, relationships with the natural environment and the sustainable use of natural resources, and, relationships between people, which are reflected in language, narratives social organisation, values, beliefs and cultural laws and customs (Andrews et al 2006).*

Aboriginal cultural knowledge was traditionally bequeathed through oral traditions from generation to generation. Within all Aboriginal communities there was a time of dislocation and upheaval associated with the arrival of European settlers. This widespread disruption resulted the loss of varying degrees of detailed knowledge and understanding of many of the elements of the cultural landscape from Aboriginal communities. A recognition and concern regarding this loss of knowledge of the cultural landscape and the meanings embedded in the landscape was expressed by several of the stakeholders during consultation for the project.

It should be noted that Indigenous communities across Australia are extremely diverse, and generally defy generalisation. The above descriptions are common conceptions of Aboriginal cultural landscapes and values, however, a large range of beliefs and practices are evident across Australia and uniformity should not be assumed.

## 5.4. Identified Aboriginal cultural heritage values

The previous and current consultation process with stakeholders and on-site discussions with Aboriginal site officers identified the following cultural heritage values within the landscape (Table 5-1).

**Table 5-1 Cultural heritage values identified by registered Aboriginal parties**

Cultural heritage value	Description
Resource gathering locations and techniques	Stakeholders identified that they still fish and collect wild food throughout the region. The techniques and primary resource gathering locations are known and passed on through generations.
Scarred trees	Stakeholders identified scarred trees as being of sacred and ceremonial significance. This was due in part to these being some of the only 'markers' remaining in the landscape as a result of European agricultural practices. In the Jali LALC area, scarred trees are located along a pathway from the Blackwall Ranges leading to a stone quarry. In the project region, scarred trees also mark ceremonial sites such as bora rings, and occasionally burial sites.
Pathways through the landscape	Across the entire boundary of the project registered Aboriginal parties identified numerous pathways that lead from the ranges to the coast. These pathways also link spiritual and ceremonial sites. During the current field survey, Aboriginal Sites Officers identified the importance of spurs and ridgelines as a route for travel through the landscape. These pathways were generally a link between the coastline and the mountain ranges. These pathways link spiritual and ceremonial sites, artefact scatters often occur along these pathways, as well as scarred trees which may be located at junctions, or other significant points in the pathways.
Water courses, water holes or springs	Permanent water bodies are culturally significant as a central location for gathering of people, resource collection and camping. Watercourses are often associated with spiritual beings. Within the Blackwall Ranges, there are springs and waterfalls that were accessed and have cultural significance.
Aboriginal plants and animals	Aboriginal plants and animals are significant to traditional owners. During the consultation process animals and plants were often mentioned in context of resource collection and spiritual importance.
Burial sites	Burial sites are of great importance and generally are of high concern to Traditional Owners as the location of burials is rarely documented. Anecdotal evidence of burials needs proper consideration.

Cultural heritage value	Description
Areas of spiritual significance	The strong attachment that traditional owners have to the project and surrounding landscape is evident through their Dreaming stories and social connections. Stories relating to creation beings <i>Birrugan</i> , and <i>Mindi</i> and <i>Baiamie</i> link a number of places across the district including Yamba, Woodburn, Tyndale, and the Clarence and Richmond Rivers.
Post-contact sites	Post-contact sites are those which have gained significance to Aboriginal people after the arrival of European settlers.
Massacre sites	These are of great importance to the Traditional Owners, and are often difficult to discuss. Purported massacre sites near the boundary of the project are located in the vicinity of Cooks Hill and Woodburn.

## 5.5. Aboriginal cultural places within or adjacent to boundary of the project

The cultural assessment has identified one Aboriginal cultural place within or adjacent to the boundary of the project Table 5-2.

**Table 5-2 Aboriginal cultural places within or adjacent to the boundary of the project**

Project section	Place name (AHIMS ID)	Information	Within or adjacent to the boundary of the project
7	Withheld (13-1-0111)	A tree with engraved markings is reported to be situated in the general vicinity of New Italy, towards the northern end of the boundary of the project between Iluka Road and Woodburn. The tree is associated with a women's site and was recorded during field survey (Collins 2008). The tree is registered on AHIMS.	Adjacent (130 m outside) the boundary of the project

## 5.6. Aboriginal cultural places near the boundary of the project

Other Aboriginal cultural places that were identified during consultation and from the cultural heritage reports, but are not within the immediate vicinity of the boundary of the project include those listed in Table 5-3. For further details of these places, see Collins 2008.

**Table 5-3 Aboriginal cultural places near the boundary of the project**

AHIMS ID	Site name	General location	Information
NA	Clarence Peak Sacred Site	Clarence Peak	Clarence Peak is a very significant mountain with associated significant sites and is of cultural significance the Burra:way Wa:jad Traditional Owners Group (Navin Officer 2009).

AHIMS ID	Site name	General location	Information
NA	Iluka Sacred Sites	Iluka	The Iluka area is reportedly the location of important occupation and sacred sites and is of cultural significance to the Burra:way Wa:jad Traditional Owners Group (Navin Officer 2009).
NA	Clarence River Sacred Site	Clarence River, Mororo	The northern bank of the Clarence River at Mororo, two kilometres south of the boundary of the project is known to have been a traditional 'battleground' where the Bundjalung and Yaegl people met often to resolve disputes.
NA	Richmond Range Rock Wells	Richmond Range	Rock wells of traditional significance were reported on the upper slopes of the Richmond Range beyond the boundary of the project, north-west of Tabbimoble Creek (Collins 2008).
13-1-059	NA	The Gap Road, south of Evans Head	A culturally significant burial site is located east of the existing highway reserve and south of The Gap Road. Aboriginal representatives have requested that the burial be avoided during the course of the highway construction and ancillary works (Collins 2008).

## 6. Summary of archaeological assessment

This Chapter summarises the archaeological assessment undertaken as part of this report. The full archaeological assessment for Iluka Road to Woodburn can be found in Volume 2 (Appendix A), which accompanies this document.

The archaeological assessment was undertaken by fully qualified and experienced archaeologists and heritage consultants, primarily Joseph Brooke (Bachelor of Archaeology (Honours), 6 years experience), Robyn Jenkins (Bachelor of Arts, Bachelor of Social Science (Honours), and 5 years experience), and Vanessa Edmonds (Bachelor of Arts, Master of Letters, 25 years experience).

Also presented here is a methodology for assessing of the risk of impacting sites by a number of ancillary works proposed for the boundary of the project. As the proposed areas for the ancillary works were identified later in the assessment stage, they weren't able to be subject to field investigation. As such, the areas would be subject to a separate Aboriginal archaeological report, and if required, an addendum to this CHAR.

### 6.1. Assessment methodology

The methodology of the archaeological assessment built on each of the stages listed below, through ongoing consultation and revision. The stages were broadly structured as follows:

1. Desktop assessment to develop a predictive model.
2. Survey program.
3. Sub-surface testing program.

All stages of the archaeological assessment included consultation and involvement with the registered Aboriginal parties is shown in Section 3.4.

Key to the archaeological assessment was the following steps:

- Reviewing existing data (including any previous investigations specific to the project, AHIMS searches, etc) to identify any gaps in the assessments and to develop a predictive model to aid in identifying areas within the boundary of the project more sensitive to the discovery of archaeological sites. This specifically informed the survey program with previously identified PADs generally not subject to further survey.
- Developing a cultural heritage assessment methodology and consultation strategy. The methodology was presented to the registered Aboriginal parties for discussion and development prior to any fieldwork commencing.
- Undertaking field investigations (survey and sub-surface testing) with Aboriginal sites officers. Discussions regarding the methodology, PAD/site condition and initial management recommendations were also undertaken in the field.



- Recording and analysis of cultural material in the field, as material could not be removed off site.

## 6.2. Ancillary works assessment

In addition to the boundary of the project, ancillary areas are required adjacent to the boundary of the project for construction.

These areas were identified following the field investigations, and were consequently not able to be assessed during field investigations for this CHAR. As part of the cultural heritage investigation, these ancillary areas have been assessed at a desktop level to determine the potential risk of impact to Aboriginal heritage and identify whether any require further investigation to determine potential risk of impact, or recommending that the site's use as an ancillary area is modified. The areas were assessed against the following criteria:

- Approximate area outside of boundary of the project – all areas inside the boundary of the project were assessed as requiring no further investigation, as these have already been covered by the project assessment, any areas outside the boundary of the project were recommended for survey.
- Presence of site or cultural place within the ancillary site.
- Presence of site or cultural place within 25 metres of the ancillary site.
- Land system – to place the ancillary site within the predictive model developed in the archaeological assessment (Appendix A).
- Landform – to better contextualise the ancillary site within the predictive model.
- Potential archaeological sensitivity was used to inform whether and to what level investigation was recommended.

Potential archaeological sensitivity was assessed based on the predictive model (see Appendix A) using a combination of factors including landform, and proximity to a known site or PAD. Modelling by OEH was also used to inform potential archaeological sensitivity. This matrix then fed into an assessment of the risk of each ancillary works area impacting upon Aboriginal cultural heritage. Recommendations were then made for consultation and field assessment where the risk of impact to Aboriginal cultural values was not sufficiently known (ie where outside the boundary of the project), and/or where there was a known risk to impact Aboriginal cultural heritage values.

Broadly, the recommendations fell into four categories:

- Survey and consultation.
- Survey, sub-surface testing and consultation.
- Follow management recommendations proposed in Section 9.2.
- No further investigation.

At a minimum, for all ancillary areas that fell outside the boundary of the project, survey and consultation with registered Aboriginal parties was recommended, as the risk to Aboriginal cultural heritage was not sufficiently known. Additionally, sub-surface testing was recommended for those

ancillary areas outside the boundary of the project with higher potential archaeological sensitivity and/or those where there was a known Aboriginal cultural heritage site/PAD within or immediately adjacent to the ancillary area. Where an Aboriginal cultural place is identified partially or wholly within an ancillary area, further consultation with registered Aboriginal parties, and their approval would be sought regarding the appropriateness of the ancillary area and proposed works there. This process was discussed and accepted by registered Aboriginal parties during an AFG meeting.

For ancillary areas that fell within the boundary of the project where the main cultural heritage assessment in this report identified no specific Aboriginal cultural heritage values, the risk of impact to Aboriginal cultural heritage values was assessed as low and no further investigation was recommended. For ancillary areas that fell within the boundary of the project, and the main cultural heritage assessment in this report identified some Aboriginal cultural heritage value, then following the actions outlined in Section 9.2 was recommended.

The ancillary area assessment matrix table can be found in Appendix F. The specific recommendations to manage the investigations are found in Figure 6-1.

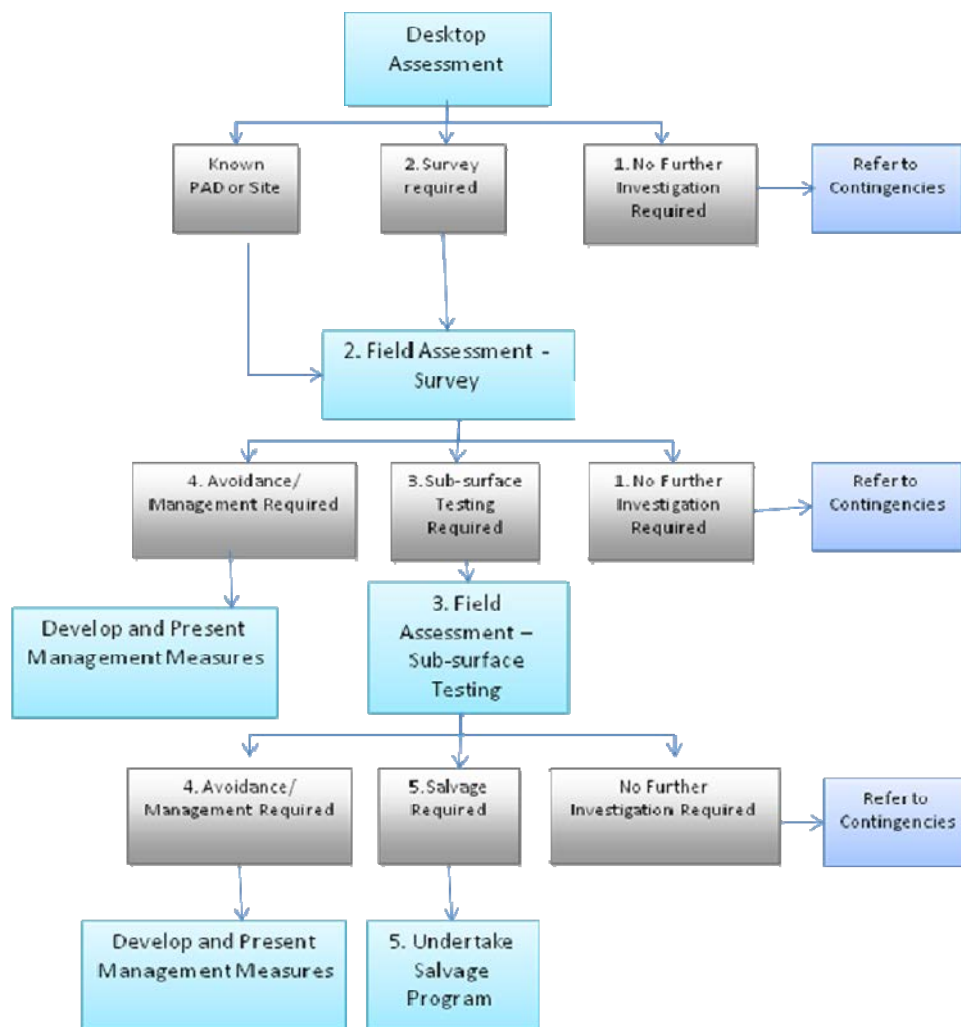


Figure 6-1 Management process to apply to construction ancillary sites

The steps outlined in Figure 6-1 are dependent on what is found to be present/absent from the ancillary sites or any change in the proposed locations. All investigations would be in accordance with the Due Diligence Code of Practice for the Protection of Aboriginal Objects in New South Wales (OEH 2010), and have regard to the Code of Practice for Archaeological Investigations of Aboriginal Objects in NSW (OEH 2010). Field investigations are occurring concurrently with the display of this EIS, with the results to be identified in the project submissions report.

## 1. No survey required

- Determined through the desktop assessment to being part of an area that has already been assessed or once survey and sub-surface testing it has been determined to not be a site.
- Refer to contingencies (section 9.4) for measures to be undertaken in the case of the unexpected discovery of cultural material or human remains.

## 2. Survey required

- Survey would be undertaken at all ancillary works and design change areas identified during the desktop as requiring investigation. The triggers for this would be if there is a known PAD or site, or the area has not been subject to any previous field investigation.
- Survey would involve the nominated Aboriginal site officers identified for the area.
- Survey would be undertaken by two methods:
  - Visual inspection – which would not require the entire area to be walked over due to past ground disturbance (eg road cutting) or environmental constraint (eg swamp). This would only be considered adequate if the nominated Aboriginal sites officers are in agreement with the approach.
  - Foot survey – this would be undertaken with evenly spaced transects.
- The survey would identify if there is a Potential Archaeological Deposit (PAD), if there is an area that may require avoidance or management (such as a Scarred Tree) or if there is no further investigation required.
- The PAD would be registered in AHIMS and further investigation would be undertaken.

## 3. Sub-surface testing required

- Sub-surface testing would be undertaken at all ancillary works and design change areas identified during the survey as being a PAD and requiring excavation.
- The methodology would follow that utilised during the original investigations. Broadly it is as follows:
  - Excavation only within the ancillary works or design change area boundary.
  - Spacing of test pits 10 metres – 20 metres apart in transects or parallel transects to create a grid.
  - Excavation of a series of 0.5 metre x 0.5 metre test pits by hand tools (eg trowel and shovel).

- Excavation was undertaken in a controlled manner, with the first test pit for each area in 50 millimetre spits (depth units), and subsequent test pits in that area in 50 millimetre to 100 millimetre spits (depending on soil layers identified).
- Sieving of excavated sediment using approximately 5 millimetre aperture wire-mesh sieves.
- Excavation below archaeological deposits into sterile soils.
- Drawing of stratigraphic profiles, and taking of scaled photos of every test pit;
- Finishing excavation in an area when enough information has been recovered to adequately characterise the objects present with regard to their nature and significance.
- Backfill of all completed test pits.
- Completion of Aboriginal site impact recording forms (ASIRFs) for all excavation areas and lodging of these with AHIMS (underway at present).
- Excavation may also include larger size test pits such a 1 metre x 1 metre or trenches using the same hand methods.
- Sub-surface testing would identify if there is a need for further investigation (salvage) or if there is no further investigation required.

#### **4. Avoidance or management**

- There may potentially be a need to avoid an area or incorporate a management strategy. For example if a scarred tree is located.
- If a need is identified for avoidance or management of an area, the specific requirements would be discussed in consultation with an archaeologist, the registered Aboriginal parties and RMS.

#### **5. Salvage**

- Salvage recommendations would be developed for each site discovered prior to any field salvage investigations being undertaken.
- The specific requirements would be discussed in consultation with an archaeologist, the registered Aboriginal parties and RMS.
- Recommendations would involve both hand excavation and/or mechanical excavation with a mechanical sieve. The salvage recommendations provided for specific sites in this report (Table 9-2) would be used as a guide to develop the salvage framework.

### **6.3. Results of the archaeological assessment**

A total of 2,699,753 square metres (270 hectares) was subject to survey (including that undertaken by Collins and the Alliance) within the boundary of the project between Iluka Road and Woodburn, totalling over 84 per cent of the boundary of the project. The remainder of the boundary of the project is not considered a risk for impact to cultural heritage sites or places, due to previous significant impacts (primarily the current Pacific Highway), and so does not require survey. It should

be noted, however, that Aboriginal stakeholders consulted felt that despite previous impacts, these areas still retained cultural significance and potentially unidentified spiritual significance. The Alliance survey yielded an effective coverage (accounting for visibility and proportion of the sub-surface exposed) of four per cent, and a total of four sites and one PAD were identified. Of the four sites, one was an artefact scatter with a PAD component, one an isolated artefact with a PAD component, and two were isolated artefacts. Within this Chapter of the project, only three locations within the boundary of the project between Iluka Road and Woodburn had potential archaeological deposits and thus required further assessment (Table 6-1). Of these three areas test-excavated, two contained sub-surface Aboriginal deposits of small amounts of stone artefacts; there were no artefacts discovered at the third, Bolger PAD, which is now no longer a PAD and is confirmed to not be a site.

Sub-surface testing included the excavation of 70 shovel test pits (0.5 metres x 0.5 metres). At the completion of the archaeological assessment, a total of four archaeological sites have been identified near or within the boundary of the project (Table 6-1). The details of these findings can be found within Volume 2, while the significance of these sites is presented in Chapter 7, below; a summary is provided in Table 6-1.

**Table 6-1 Status of areas or sites investigated by survey and sub-surface testing in the boundary of the project between Iluka Road and Woodburn**

Project section	Name (AHIMS ID)	Previous type(s)	Description	Excavation	Sub-surface testing results	Updated name	Updated site type(s)
7	IR2W1 13-1-0114	Site – Isolated artefact	On a compact clay exposure on the creek flat south of Tabbimoble Creek. No further artefacts could be detected and in view of its disturbance context it is concluded that the site location has little further archaeological potential.	None	N/A	IR2W1	Site – Isolated artefact
7	Bolger PAD (13-1-0186)	PAD	Low, flat sandy rise adjacent swamp.	20 shovel test pits	No artefacts	None	No material found from sub-surface testing – <b>no longer considered to be a PAD or site</b>
8	IR2W2 (13-1-0112)	Site – Artefact scatter and PAD	Nine visible stone artefacts of a range of materials located on a 120 m long and two metre wide section of track that extends across the northern upper slope and crest of an undulating a ridgeline	20 shovel test pits	3 artefacts	IR2W2	Site – Artefact scatter
8	IR2W3 13-1-0113	Site – Isolated artefact	Greywacke flake on the level crest of an undulating ridge. Significant disturbance in and around site.	None	N/A	IR2W3	Site – Isolated artefact
8	IR2W4 PAD (13-1-0115)	Site – Isolated artefact and PAD	Pebble tool located on the northern upper slopes of a ridge	20 shovel test pits	11 artefacts	IR2W4	Site – Artefact scatter

## 7. Significance assessment

### 7.1. Methodology

#### 7.1.1. Basis for assessment

A significance assessment is made up of several significance criteria that attempt to define why a site is important. Evidently, this can be challenging as sites are important for different reasons to different people, and even at different times. The assessment of Aboriginal cultural heritage in this assessment is based upon the four values of the *Australia ICOMOS Burra Charter* (Australian ICOMOS 1999).

- Social values.
- Historical values.
- Scientific values.
- Aesthetic values.

Each of these values is assessed below, and an overall significance is then given based on an average across the values. This is inherently a reductive process, and oversimplifies what is important to a range of different stakeholders, but is a necessary process in being able to create comparative values between sites. The significance of each site ultimately feeds the management of sites and places (see Chapter 9).

#### 7.1.2. Social significance

The significance of a site does not relate only to its scientific or research value. Aboriginal people's views on the significance of archaeological sites are usually related to traditional, cultural and educational values, although some Aboriginal people also value any scientific information a site may be able to provide.

Aboriginal cultural significance was assessed from consultation with the nominated Aboriginal site officers and other members of the stakeholders, including Elders, both during and following field assessments. It should be noted that Aboriginal significance assessed in this manner may not reflect the views of all members of the community.

#### 7.1.3. Scientific significance

Aboriginal site significance assessments need to consider both the scientific and social or cultural values of a site. Research potential or scientific significance of an Aboriginal archaeological site can be assessed by utilising the criteria set out below. Social or cultural values of a site can only be established through Aboriginal consultation.

Criteria used for assessing scientific significance for Aboriginal archaeological sites are described below. Ratings are low, moderate or high.

- **Site integrity** – The integrity of a site refers to its state of preservation, or condition. A site can be disturbed through a number of factors among which are: natural erosion processes, destructive land use practices or repeated use of a site in the past by both humans and animals.
- **Site structure** – Structure refers to a site’s physical dimensions, that is, size and stratification, or sub-surface deposits. A large site or a site with stratified deposits has more research potential than small sites and/or surface scatters. Sometimes however, specific research questions may be aimed at smaller sites in which case they would be rated at a higher significance than normal. Site structure cannot be assessed for scarred trees or isolated artefacts.
- **Site contents** – This category refers to the range and type of occupation debris found in a site. Generally, complex art sites, extensive quarries with associated debris and surface sites that contain a large and varied amount of organic and non organic materials are considered to have greater research potential than those sites with small, uniform artefacts, single motif art sites and small quarries with little or no debris. With scarred trees contents may refer to the size and type of scar or how many there are on the one tree.
- **Representativeness and rarity** – Representativeness refers to how much variability exists between the subject site and others inside or outside the subject area. It also considers the types of sites already conserved in the area and how much connectivity between sites exists. Rarity considers how often a particular site type occurs in an area. Assessment of representativeness and rarity requires some knowledge of the background archaeology of the area or region in which a study is being undertaken. Rarity also relates to whether the subject site or area is important in demonstrating a distinctive way of life, custom, process, land use, function or design which is no longer practiced (OEH 2011:10).

#### 7.1.4. Aesthetic significance

This refers to the ‘sensory’ value of a place, and can include aspects such as form, texture, and colour, and can also include the smell and sound elements associated with use or experience of a site (Australian ICOMOS 1999). Aesthetic significance can be closely linked to the social value of a site.

#### 7.1.5. Historic significance

The historic value of a site is determined through its association with historically important people, events or activities.

#### 7.1.6. Scale of significance

Significance of sites and places is assigned to different geographic scales, such as local, regional, State and National, appropriate to the scale of importance. For example, Uluru is significant at a National (and World) scale, whereas a local historic building may only be significant on a local scale. This is reflected in the variety of heritage lists held by local councils, up to State and Federal government. In scale of significance, the criteria presented above as well as educational or research potential, representativeness and rarity (Australian ICOMOS 1999) have been considered in determinations of significance.



Each site has been assessed and its scale of significance has been identified as being of importance at the State, regional or local level. Each site has also been given a grading of its significance overall based on the grading of each of the individual values. The gradings of low, moderate and high have been assigned comparatively across the sites investigated in the region.

## 7.2. Statements of significance

### 7.2.1. IR2W1 (AHIMS ID 13-1-0114)

#### **Social significance**

- Site IR2W1 comprises an isolated artefact and has low social significance as it provides evidence of the use of the area by Aboriginal people in a very limited way.

#### **Historical significance**

- The site does not meet this criterion.

#### **Scientific significance**

- The site has low scientific significance as it is ranked as having low integrity, no structure, low contents and low representativeness/rarity.
- The integrity of the site is low as it has been heavily disturbed by post-contact land-use practices. The site has no structure as it comprises a single isolated artefact. The site has a low contents ranking as the site comprises of a single artefact and the raw material is common to the area. The site has a low representativeness ranking as artefact scatters are common within the region. The site has no research or educational potential.

#### **Aesthetic significance**

- The site does not meet this criterion.

#### **Summary statement of significance**

- Overall IR2W1 is of low significance at the local level. It is of low social significance as it provides evidence of the use of the area by Aboriginal people in a very limited way. It has low scientific significance due to its comprising a single isolated artefact, made from common raw material and the overall common presence of stone artefact scatters in the region.

### 7.2.2. Scarred/engraved Tree (AHIMS ID 13-1-0111)

#### **Social significance**

- The scarred/engraved tree has high social significance as it is of sacred and ceremonial importance to the traditional owners, particularly through its association with a women's ceremonial site.

## Historical significance

- The tree has high historical significance as it is one of the few remaining Aboriginal 'markers' in the landscape following clearing as part of European agricultural practices.

## Scientific significance

- The tree has moderate-high scientific significance as it has moderate integrity, moderate-high contents and high representativeness/rarity.
- The tree has moderate integrity due to its reasonable condition. Its contents are moderate-high due to the presence of engravings on the tree. The tree has high representativeness/rarity due to the scarcity of scarred trees remaining in the region. The tree has some research potential and potential for educational purposes in passing on knowledge regarding traditions and activities that result in the scarring of trees.

## Aesthetic significance

- The site is of moderate-high aesthetic significance as it is a distinctive visual marker in the landscape and the distinctive engraving.

## Summary statement of significance

- Overall the scarred/engraved tree is of high significance at the local level and moderate significance at the regional level. It is highly socially significant due to its association with a women's ceremonial site. It has high historical significance as one of the few remaining 'markers' in the landscape representative of occupation of the region by Aboriginal people up into the historical period. It has moderate scientific significance due to its condition, rarity and the presence of engravings. The tree has some research and educational potential.

### 7.2.3. IR2W2 (AHIMS ID 13-01-0112)

## Social significance

- The site IR2W2 has moderate social significance as it provides evidence of the use of the area by Aboriginal people.

## Historical significance

- The site does not meet this criterion.

## Scientific significance

- The site has low scientific significance as it is ranked as having low integrity, low structure, low contents and low representativeness/rarity.
- The integrity of the site is low as it has been heavily disturbed by post-contact land-use practices. The site has no structure as it comprises a low density artefact scatter. The site has a low contents ranking as the site comprises of a low density artefact scatter and the raw

materials are common to the area. The site has a low representativeness ranking as artefact scatters are common within the region. The site has some educational value in regard to resource use and occupation of different elements of the landscape.

### **Aesthetic significance**

- The site does not meet this criterion.

### **Summary statement of significance**

- Overall IR2W2 is of low-moderate significance at the local level. It is of moderate social significance as it provides evidence of the use of the area by Aboriginal people. It has low scientific significance as it is a low density artefact scatter, with common raw materials and the overall common presence of stone artefact scatters in the region. The site has educational value regarding resource use and occupation of different elements of the landscape.

### **7.2.4. C3/2/2 (AHIMS ID 13-01-0110)**

### **Social significance**

- The burial at site C3/2/2 is of high social significance to the traditional owners.

### **Historical significance**

- The historical significance of the site is unknown without further research.

### **Scientific significance**

- The site has moderate-high scientific significance through its ranking of moderate integrity, low structure, moderate-high contents, and high representativeness/rarity.
- The site had moderate integrity as it is in a reasonably undisturbed location. The site has low structure as it likely relates to a single deposition with little stratification. It has moderate-high ranking for contents based on the likely material contained in the site. It has a high representativeness/rarity rating as burials are rare on the north coast of NSW.

### **Aesthetic significance**

- The site does not meet this criterion.

### **Summary statement of significance**

- Overall the burial of site C3/2/2 is of moderate-high significance. It is of high social significance to the traditional owners and has moderate-high scientific significance based on its relative integrity, the materials within the site and the rarity of the site.

## 7.2.5. IR2W3 (AHIMS ID 13-1-0113)

### **Social significance**

- Site IR2W3 comprises an isolated artefact and has low-moderate social significance as it provides evidence of the use of the area by Aboriginal people in a limited way.

### **Historical significance**

- The site does not meet this criterion.

### **Scientific significance**

- The site has low scientific significance as it is ranked as having low integrity, no structure, low contents and low representativeness/rarity.
- The integrity of the site is low as it has been heavily disturbed by post-contact land-use practices. The site has no structure as it comprises a single isolated artefact. The site has a low contents ranking as the site comprises of a single artefact and the raw material is common to the area. The site has a low representativeness ranking as artefact scatters are common within the region. The site has no research or educational potential.

### **Aesthetic significance**

- The site does not meet this criterion.

### **Summary statement of significance**

- Overall IR2W3 is of low significance at the local level. It is of low social significance as it provides evidence of the use of the area by Aboriginal people in a very limited way. It has low scientific significance due to its comprising a single isolated artefact, made from common raw material and the overall common presence of stone artefact scatters in the region.

## 7.2.6. Saw Pit Creek (AHIMS ID 13-1-0059)

### **Social significance**

- The burial the Saw Pit Creek site is of high social significance to the traditional owners.

### **Historical significance**

- The site is of moderate historical significance due to historic interactions with this site.

### **Scientific significance**

- The site has moderate scientific significance through its ranking of moderate integrity, low structure, moderate-high contents, and high representativeness/rarity.
- The site had moderate integrity as it is in a reasonably undisturbed location. The site has low structure as it likely relates to a single deposition with little stratification. It has moderate-high

ranking for contents based on the likely material contained in the site. It has a high representativeness/rarity rating as burials are rare on the north coast of NSW.

### **Aesthetic significance**

- The site does not meet this criterion.

### **Summary statement of significance**

- Overall the burial is of moderate-high significance. It is of high social significance to the traditional owners. It has moderate historical significance and has moderate-high scientific significance based on its relative integrity, the materials within the site and the rarity of the site.

### **7.2.7. IR2W4 (AHIMS ID 13-01-0115)**

#### **Social significance**

- The site IR2W4 has moderate social significance as it provides evidence of the use of the area by Aboriginal people.

#### **Historical significance**

- The site does not meet this criterion.

#### **Scientific significance**

- The site has low scientific significance as it is ranked as having low integrity, low structure, low contents and low representativeness/rarity.
- The integrity of the site is low as it has been heavily disturbed by post-contact land-use practices. The site has no structure as it comprises a single component, low density artefact scatter. The site has a low contents ranking as the site comprises of a low density artefact scatter with a common range of artefact types and the raw materials are common to the area. The site has a low representativeness ranking as artefact scatters are common within the region. The site has some educational value in regard to resource use and occupation of different elements of the landscape.

#### **Aesthetic significance**

- The site does not meet this criterion.

#### **Summary statement of significance**

- Overall IR2W4 is of low-moderate significance at the local level. It is of moderate social significance as it provides evidence of the use of the area by Aboriginal people. It has low scientific significance as it is a low density artefact scatter, with common raw materials and the overall common presence of stone artefact scatters in the region. The site has educational value regarding resource use and occupation of different elements of the landscape.

## 7.3. Summary

The summary of the significance assessment of Aboriginal cultural places and archaeological sites is shown in Figure 7-1. The scientific significance assessment is shown in Appendix A.

**Figure 7-1 Summary of significance assessment of sites/places near or within the boundary of the project between Iluka Road and Woodburn**

AHIMS ID	Name	Scientific significance	Social significance	Aesthetic significance	Historical significance	Overall significance
13-1-0114	IR2W1	Low	Low	n/a	n/a	Low
13-1-0111	Scarred/engraved Tree	Moderate-high	High	Moderate – High	High	High
13-1-0112	IR2W2	Low	Moderate	n/a	n/a	Low-Moderate
13-1-0110	C3/2/2	Moderate – High	High	n/a	Unknown	Moderate – High
13-1-0113	IR2W3	Low	Low-Moderate	n/a	n/a	Low
13-1-0059	Saw Pit Creek/ New Italy	Moderate	High	n/a	Moderate	Moderate – High
13-1-0115	IR2W4	Low	Moderate	n/a	n/a	Low-Moderate

## 8. Impact assessment

The potential impact to Aboriginal cultural places and archaeological sites recorded within or near the boundary of the project has been considered. This Chapter looks specifically at those areas where:

- Avoidance of a site or place will occur due to changes to the boundary of the project, and site may fall partially or wholly outside the boundary of the project, or some portion may remain within the boundary of the project but be avoided by construction.
- A site or place may not be directly impacted by construction of the project, but may be at risk of indirect impacts, such as a culturally sensitive place becoming more visible/accessible due to the construction of the project.
- Partial impact to a site or place would occur, with avoidance to part of the site within and/or outside of the boundary of the project.
- Impact is unavoidable and the site will be totally destroyed.

### 8.1. Impact avoidance

All recorded Aboriginal cultural places and archaeological sites recorded within or near to the boundary of the project have been considered in relation to the proposed road construction, operation and associated activities.

During the development of the preferred route and development of the concept design, the alignment was modified where possible to avoid or limit the impact to identified Aboriginal cultural values, particularly those of high significance. Examples of project refinements made to avoid Aboriginal cultural sites and archaeological sites include:

- The boundary of the project was realigned to avoid impact to the Sawpit Creek Burial and an important engraved tree marking a women's site near New Italy.
- The boundary of the project was realigned to avoid impact to a massacre site on the southern side of Woodburn.

Despite the refinements described above, some impacts would still occur at a number of identified sites and places. The majority of impacts to Aboriginal cultural places and archaeological sites along the boundary of the project would be likely to occur during the construction phase of the project. The types of impact that would occur include:

- Direct impacts from road construction that would destroy or partially impact sites.
- Construction of temporary sites ancillary to the main road formation (eg construction compounds, batching plants or bulk materials storage) that would have direct and indirect impacts to part or all of sites.
- Indirect impacts during operation (such as water run-off, visibility, etc).

These impacts to Aboriginal heritage from the project (either permanent or temporary) are attributed to cultural places, archaeological sites and can be site specific or apply on a regional scale. Some of the impacts, especially the indirect impacts are avoidable through management measures.

## 8.2. Impacts

For the purpose of this impact assessment, it is assumed that all places and sites occurring within the boundary of the project would be impacted. Adjustments to the construction footprint within the boundary of the project may be possible to avoid impact to some of these sites – this option should be explored wherever possible, before mitigation is considered.

A total of four sites will be impacted by the project within the boundary of the project between Iluka Road and Woodburn. Of the four sites to be impacted, one (IR2W2) will only be partially impacted, with part of the site occurring outside of the boundary of the project and will therefore be partially avoided. No Aboriginal cultural places will be impacted by the project between Iluka Road and Woodburn. Based on the significance of these sites, avoidance of impact is not justified.

**Table 8-1 Impacts to archaeological sites and Aboriginal cultural places within and/immediately adjacent to the boundary of the project between Iluka Road and Woodburn**

AHIMS ID	Updated name	Overall significance	Site type	Impact	Description
13-1-0114	IR2W-1	Low	Isolated artefact	Direct	All of this site (one artefact) is within the construction footprint of the project and would be subject to excavation for construction of approximately 5 m of road. The result would be impact to the entire site and irreversible impact to its heritage values.
13-1-0111	Withheld	High	Modified tree	None	No direct or indirect impacts to this site are likely from the project.
13-1-0112	IR2W-2	Low-moderate	Artefact scatter	Direct	Part of this site (one artefact) is within the construction footprint of the project and would be subject to excavation for construction of approximately 50 m of road. The result would be impact to approximately 20% of the site and moderate impact to its heritage values. The extent of this site extends to the east and west outside the boundary of the project.
13-1-0110	C3/2/2	Moderate-high	Burial	None	No direct or indirect impacts to this site are likely from the project.



AHIMS ID	Updated name	Overall significance	Site type	Impact	Description
13-1-0113	IR2W-3	Low	Isolated artefact	Direct	All of this site (one artefact) is within the construction footprint of the project and would be subject to excavation for construction of approximately 5 m of road. The result would be impact to the entire site and irreversible impact to its heritage values.
13-1-0059	Saw Pit Creek / New Italy	Moderate-high	Burial	None	No direct or indirect impacts to this site are likely from the project.
13-1-0115	IR2W-4	Low-moderate	Artefact scatter	Direct	All of this site is within the construction footprint of the project and would be subject to excavation for construction of approximately 64 m of road cutting. The result would be impact to the entire site and irreversible impact to its heritage values.

## 8.3. Cumulative impact

### 8.3.1. Introduction

Cumulative impacts can be defined as the combined effects of environmental or social impacts that occur because of multiple activities and developments with similar impacts within a particular local area and region. Cumulative impacts can be measured generally overtime, or within discrete periods, such as the cumulative impacts of a project, or the cumulative impacts of European land-use activities.

A process for the assessment of cumulative impact has not been defined or endorsed by the NSW Government. Therefore, a range of approaches have been used in the past and the scope and complexity of these assessments have generally related to the scale of the proposal, the predicted interactions and the nature of the available comparative and baseline data.

The assessment of cumulative impacts on cultural heritage values must take into account the fact that many cultural values are a non-renewable resource, associated with a finite and limited number of surviving places and objects. Except for those cultural traditions which revive or reinterpret past belief within new material forms, cultural heritage is mainly invested in the material evidence of the past. As such there is little ability to revive or re-establish the material past. It follows that each incremental loss of the material record of the past is irreversible, and itself a factor in changing perceptions of rarity and value.

Ideally an assessment of cumulative impacts should be measured against a baseline of data which characterises the existing cultural resources to be impacted, and the cumulative loss already realised. In the case of the local and regional contexts of the proposed project, effective data sets of such cultural heritage information do not exist. The OEH AHIMS database provides a register of known Aboriginal places in NSW, but is limited in its application due to the multiple and selective factors which affect the registration of recordings. Only a very small proportion of NSW has been the subject of comprehensive archaeological survey, and consequently, most patterns or trends evident within AHIMS site distributions reflect variables in data collection rather than the actual surviving resource. For example, following cultural heritage investigation for this project, the AHIMS register would show a relatively large concentration of sites in and around the boundary of the project compared to the surrounding region. This merely reflects the large scale of investigation undertaken for the project, rather than the actual distribution of sites. The gaps in archaeological survey across the project region mean that the AHIMS register does not provide a complete baseline for a comprehensive cumulative impact assessment. However as the only baseline data available it does help inform qualitative observations and discussion on the cumulative impact.

### 8.3.2. Assessment

In considering the regional scale cumulative impact of the project, archaeological values across a range of site types and landforms must be assessed. Sites (type, density, integrity) do not exist in isolation. They are associated with particular landforms and natural features. Considering the combinations of these sites and features in an area assists in drawing conclusions about cumulative impacts.

Approximately 20 per cent of the entire project has been extensively impacted by previous earthmoving works and construction (predominantly the current and previous alignments of the Pacific Highway), such that there is no potential for Aboriginal heritage evidence to survive in those portions of the project. It should be noted however, that Aboriginal stakeholders consulted felt that despite previous impacts, these areas still retained cultural significance and potentially unidentified spiritual significance. Outside these areas, activities such as logging and sugar cane farming have over long periods disturbed much of the boundary of the project, so that many non-robust archaeological site types, such as scarred trees, bora rings, shell deposit and burials, have been destroyed, and more robust site types (such as artefact sites) have lost much of their integrity. Modelling on the OEH website (<http://www.environment.nsw.gov.au/licences/AboriginalSitesDecisionSupportTool.htm>) supports this theory with significant reductions in predicted distributions of scarred trees, shell deposit and burials between 1750 and the current model for the boundary of the project. This phenomenon has the effect of making these site types more significant due to their increased rarity and they thus need consideration of conservation and protection. Conversely, because of this disturbance, the potential impact of the Pacific Highway Upgrade to Aboriginal heritage is smaller, as most of the boundary of the project has already been at least moderately disturbed.

Based on the boundary of the project, a total of seven sites are within 200 metres of the boundary of the project (three of which were known prior to the current investigations). Of these seven, direct impact would be avoided to three sites – all highly significant burial and engraved tree sites. The overall significance of each of the four impacted archaeological sites is low and low-moderate.

The regional Aboriginal cultural heritage values across the project would be minimally reduced by the cumulative impacts from the project. Throughout the process, efforts were made by the RMS throughout the project stages to date to avoid impact to more significant Aboriginal cultural places and archaeological sites, such as burials, carved trees and ceremonial sites, thus leading to reduced cumulative impact to the Aboriginal cultural values of the region.

Modelling by OEH (<http://www.environment.nsw.gov.au/licences/AboriginalSitesDecisionSupportTool.htm>) shows that prior to Aboriginal cultural heritage investigations for the project, the areas of moderate or high knowledge gaps (called *survey priority* in the OEH modelling) in regards to Aboriginal cultural heritage sites were present across about 50 per cent of the boundary of the project. Aboriginal cultural heritage investigations for the project have significantly added to the knowledge and understanding of Aboriginal cultural heritage in the project region. A total of 84 per cent of the boundary of the project has been surveyed (the remainder is considered to have little to no cultural heritage potential), and all PADs have been sample excavated to test for their archaeological potential. This has provided an important addition to the archaeological record, in a region that was previously not well studied. Particularly important has been the enhancement in our understanding of the sub-surface nature of sites in the region. As mentioned above, the areas investigated were in high need of archaeological assessment, and consequently, the survey and sub-surface testing program for a project this size has added value to regional knowledge and significantly helped to address investigation priority issues. Importantly, the data gathered during this investigation and the data to be gathered as part of the impact mitigation recommended in Chapter 9 are considered sufficient to

In summary, an accurate cumulative impact assessment of the project is hindered due to the lack of a comparative dataset. However, given the relatively low number of places directly impacted by the conduct of the activity, and the knowledge gained through consultation and investigation, it may be observed that the regional archaeological resource would not be impacted to a significant level because of this project. On a regional scale, loss of archaeological resources due to the project is considered very low.

As further sites are recorded in the conduct of future heritage investigations, a more complete picture of the area is created. It is noted that artefact scatters are mainly associated with elevated areas overlooking water bodies. If a broader area is considered, similar landforms in an undisturbed context exist extensively in the north coast region, thus these site types will be preserved with more integrity outside the boundary of the project.

### 8.3.3. Assay of the Pacific Highway upgrade program

Within an assessment of cumulative impact, project specific cumulative impacts must be considered. In this case, consideration of the cumulative impact of the project in the context of the entire Pacific Highway upgrade project is appropriate. The planned and partly realised upgrade of the Pacific Highway aims to construct a continuous four lane divided dual carriageway, between Hexham and the NSW-QLD border, a distance of approximately 680 kilometres.

An exhaustive cumulative assessment of the cultural heritage impacts of all portions of the Pacific Highway upgrade is beyond the scope of the present investigation. However it can be noted that the majority of the archaeological sites are common (eg small flaked-stone artefact scatters) within the region the Pacific Highway passes through, with few exceptional raw materials or artefact types. Many of these site types and associated landforms still exist un-impacted (and likely unrecorded) within the region. This notion is also supported by the large number of landform based PADs located within the Pacific Highway corridor that also extend outside the Pacific Highway corridor.

Additionally, it should be noted that the Pacific Highway upgrade project investigations often form the largest investigations in the regions that they traverse, and so add greatly to the understanding of archaeology and Aboriginal occupation in the regions, and in this way contribute a positive legacy for these regions. However, the permanency of the Pacific Highway Upgrade projects is contrasted with the less stable nature of heritage and will unfortunately and inevitably lead to some loss of the cultural heritage values of the region.

## 9. Management recommendations

To manage impacts to Aboriginal archaeological and cultural heritage the broad objectives for the project are:

- Avoid or minimise impacts on significant cultural heritage.
- Preserve as much cultural heritage in its original environment as possible.
- Maintain cultural heritage through preservation, salvage and increased knowledge.

The first principle of cultural heritage management is impact avoidance and minimisation before mitigation. If it is not possible to completely avoid sites, then mitigation is required for parts of sites that are not going to be impacted. Where complete avoidance is not possible, management recommendations must be implemented for impacted areas of each of the archaeological sites. Management recommendations have been drafted in accordance with the amount of impact to the site and the significance of the site. All management recommendations have been presented to relevant registered Aboriginal parties, and their comments have been considered and where possible incorporated into the recommendations.

A summary of the management recommendations for archaeological sites is displayed in Table 9-1. Detailed management recommendations for archaeological sites are included in Table 9-2. Where there is unexpected discovery of Aboriginal objects within the boundary of the project, refer to section 9.4 for contingency actions that would be followed.

It must be noted that many of the registered Aboriginal parties have recommended that monitoring of, or inspections following vegetation clearance or groundbreaking works be undertaken by their site officers in an effort to identify and collect any artefacts uncovered during works. However, this mitigation strategy is only endorsed by the RMS PACHCI guidelines and OEH policies where there is a significant risk that Aboriginal objects are likely to be uncovered by activities. There is not a significant risk that Aboriginal objects are likely to be uncovered by the project, and so monitoring cannot be recommended in this CHAR. As mentioned above, unexpected finds contingencies must be followed should any Aboriginal heritage material be discovered (Section 9.4). Additionally, cultural heritage awareness training must be undertaken for all personnel involved in the construction of the project to aid in the identification of Aboriginal cultural heritage material (see Section 9.1 below).

**Table 9-1 Summary of management recommendations for archaeological sites near or within the boundary of the project**

Project sections	Management recommendations	Number of sites	Name of site
8	Collection and salvage excavations (mechanical). Detailed analysis and reporting of cultural material. Dating of cultural material where applicable.	1	IR2W4

Project sections	Management recommendations	Number of sites	Name of site
7, 8	Collection of artefacts. Detailed analysis and reporting of cultural material. No salvage excavation required.	3	IR2W1 IR2W2 IR2W3

## 9.1. General project management requirements

The following requirements would apply throughout construction to the management of all Aboriginal heritage sites and places within the boundary of the project:

- Try to further minimise impacts on sites during detailed project design.
- All salvage excavations would be restricted to the site extent within the boundary of the project, and should be undertaken with regard to the Code of Practice for Archaeological Investigations of Aboriginal Objects in NSW (OEH 2010).
- All field-based mitigation (eg collection, salvage) must be undertaken with relevant Aboriginal site officers.
- Project updates would be distributed to registered Aboriginal stakeholders at least every 3 months, and AFG meetings should be held with registered Aboriginal stakeholders minimally every 6 months prior to and during construction until management actions have been completed.
- All areas would be fenced to protect sites and would include signage on all sides of the fencing. The signs would all include the following information – ‘Cultural Heritage No Go Zone’ – and include contact details of management.
- The results of the salvage excavations and the archaeological material analysis would be included within a detailed salvage report.
- Additionally, a summary report (to be made public) will accompany the technical report.
- In acknowledgement of local Aboriginal people’s connection to and millennia of continued use of the land and its natural resources, registered Aboriginal stakeholders should be provided with the reasonable opportunity to have access to some of the natural resources within the boundary of the project to maintain and develop their cultural traditions. This could include a selection of trees, or other plants. These trees or other resources should be identified in pre-construction prior to vegetation clearance.
- Cultural heritage awareness training must be undertaken for all personnel prior to involvement in the construction of the project. Where possible, this should be undertaken externally, and the possibility of a local Aboriginal organisation providing this service should be explored.
- Compliance auditing of the project for cultural heritage purposes should occur every 3 months during pre-construction and construction – any non-complying impact to Aboriginal heritage sites should be reported to the registered Aboriginal stakeholders, and resolved jointly between RMS and the registered Aboriginal stakeholders.

- An Aboriginal heritage interpretation strategy would be prepared as part of the Aboriginal heritage management plan. This will identify how archaeological and cultural information can be sustainably communicated to different audiences, including the local Aboriginal community, the local general public and the broader group of people interested in Aboriginal heritage as part of the North Coast's history. Measures would include opportunities for promoting salvage and investigation, the recovery of information, permanent installations and ways of marking the presence of Aboriginal people in the landscape, including, signage, enduring interpretation products such as books and through place naming.

## 9.2. Effectiveness of mitigation

The implementation of the management recommendations described below will be effective in avoiding impact and where avoidance is not possible, these recommendations will be effective in mitigating the impact to sites and places.

To ensure the effectiveness of the mitigation proposed and to be adaptable to any finds during the salvage that are significantly different to those in this CHAR, the salvage excavation methodology and quotas proposed in Table 9-2 must be reviewed while the salvage is underway, by at least the time 50 per cent of the quota has been reached. This should involve a discussion with the contracted archaeologist, and relevant registered Aboriginal parties. Any increase or decrease to the quota, or change of methodology proposed must be approved by the RMS Senior Environmental Environment Specialist Heritage, or the OEH. If no change to the quota is proposed, then the salvage may be completed. At any time (including after the review mentioned above), if significantly different findings are made, the quotas/methodology should be reviewed as mentioned above.

The management recommendations below have been based on the significance assessment and the current expected impact to sites and places (as described in Chapter 8 and further quantified in Table 9-2). Should impacts to sites within the boundary of the project change by more than 10 per cent, these management recommendations should be reviewed, as they may need to be adjusted according to the nature of the increase or reduction of impact. For example, an increase or decrease in impact to a site may warrant a more or less of the site to be salvaged, or may warrant the nature of the mitigation to be altered more significantly. The appropriateness of changes to salvage quotas or management recommendations would be done on a site-by-site basis, take account of the specific changes to the impact, and would be done in consultation with registered Aboriginal parties.

Any impact proposed beyond the boundary of the project as assessed in this report must be subject to assessment and consultation with registered Aboriginal parties, consistent with the process in this report.

## 9.3. Specific management requirements

### 9.3.1. Archaeological sites

Each site to be impacted by the construction works within the boundary of the project has specific management requirements (see Table 9-2), and specific management requirements have been included for site protection and avoidance. Broadly these fit into three categories:

- Collection of cultural material located during the survey and sub-surface testing program – only excavation required to collect already discovered material would be undertaken.
- Salvage excavation – mechanical and/or hand excavation to salvage the archaeology associated with these sites – this would be located in parts of the site not previously subject to sub-surface testing, but should generally be located in the vicinity of locations where features and/or higher concentrations have been recorded.
- Fencing – ‘No Go’ zones due to the location of a cultural heritage site/place.

For all salvaged material, suitable storage must be agreed upon with the registered Aboriginal parties prior to commencing salvage in those areas. If it is determined that the objects will be removed from the project area to be transferred to a separate safe storage location (temporarily or permanently), the curator of these objects will be required to ensure they comply with Section 85A of the NPW Act. This will involve the submission to OEH of a Care Agreement application which must also include an accurate catalogue of any objects collected/transferred

Where artefact concentrations per square metre (over all depths) encountered are 50 per cent greater than previously encountered, additional hand-tool salvage excavation must be undertaken. If these artefact concentrations are encountered during machine excavation, then machine excavation must stop within 20 metres, and hand-tool excavation must proceed to define the extent of the concentration within the boundary of the project. Other features that must trigger such additional salvage excavation include, encountering:

- *In situ* lithic flaking floors.
- Remains of a hearth in relatively *in situ* condition.
- *In situ* non-human bone relating to Aboriginal occupation.
- Midden deposit.

Up to but no more than an additional six square metres must be excavated in this situation at that site, unless rare features are encountered, in which case discussions with the registered Aboriginal parties and OEH should be undertaken to agree on a suitable approach.

**Table 9-2 Management requirements for archaeological sites within the boundary of the project between Iluka Road and Woodburn**

Project section	Name (AHIMS ID)	Site type	Overall Significance	Impact	Mitigation strategy/ recommendations
-----------------	-----------------	-----------	----------------------	--------	--------------------------------------

# PUBLIC

Woolgoolga to Ballina Pacific Highway Upgrade  
Aboriginal Heritage Assessment – Iluka Road to Woodburn  
Volume 1: Cultural Heritage Assessment Report

Project section	Name (AHIMS ID)	Site type	Overall Significance	Impact	Mitigation strategy/ recommendations
7	IR2W1 (13-1-0114)	Artefact scatter	Low	100%	All previously recorded artefacts must be recovered and removed off-site.
7	Withheld (13-1-0111)	Modified tree	High	0%	None, not impacted
8	IR2W2 (13-1-0112)	Artefact scatter	Low	20%	All previously recorded artefacts must be recovered and removed off-site. Much of this site will not be impacted by the project; exclusion zones should be put in place to ensure incidental damage does not occur to these archaeological deposits. This should consist of fencing such as would exclude entry by people or plant to avoid incidental impact to the site (eg high visibility construction webbing).
8	C3/2/2 (13-1-0110)	Burial	Moderate-high	0%	None, not impacted
8	IR2W3 (13-1-0113)	Artefact scatter	Low	100%	All previously recorded artefacts must be recovered and removed off-site.
8	Saw Pit Creek / New Italy (13-1-0059)	Burial	Moderate-high	0%	None, not impacted
8	IR2W4 (13-1-0115)	Artefact scatter	Low	100%	<ul style="list-style-type: none"> <li>▪ Salvage excavation must be undertaken of this site within the site extent and within the boundary of the project.</li> <li>▪ A total of 60 m<sup>2</sup> to be excavated by machine. This would be undertaken with a mechanical sieve and an excavator (900 mm bucket).</li> <li>▪ Each excavation must be undertaken in 50 mm spits to sterile base deposits.</li> <li>▪ The location of excavations should be decided upon in the field by the archaeologist and registered Aboriginal Stakeholders.</li> <li>▪ All artefacts which have previously been recorded and reburied during sub-surface testing must be recovered.</li> <li>▪ All cultural material recovered during salvage would be removed off-site for detailed analysis to be undertaken. Once analysed the material would be returned to the registered Aboriginal Stakeholders for reburial or storage at a chosen location. Details of the materials nature and context should also be provided.</li> </ul> <p>All cultural material recovered would be subject to detailed analysis and inclusion in a technical report.</p>



## 9.3.2. Aboriginal cultural places

No Aboriginal cultural places will be impacted directly or indirectly by the project, so no specific management recommendations are proposed.

## 9.3.3. Ancillary areas

All areas proposed to be used for ancillary works that are likely to contain Aboriginal objects, would be subject to further archaeological investigation. This would include archaeological field survey, and if required, archaeological test excavations.

The results of these investigations would be presented in a separate archaeological report as an addendum to this CHAR.

## 9.4. Management Procedures

### 9.4.1. Unexpected discovery of archaeological finds

The below procedure is consistent with RMS Unexpected Archaeological Finds Procedure (2011), but summarises several details – the full document should be consulted in the instance of an unexpected find; this can be found at [http://www.rta.nsw.gov.au/environment/downloads/unexpected\\_archaeological\\_finds\\_procedure.pdf](http://www.rta.nsw.gov.au/environment/downloads/unexpected_archaeological_finds_procedure.pdf), or by contacting an RMS regional environment staff.

If Aboriginal cultural heritage is found during construction activities, the following steps would be followed:

- Stop work in the immediate area (within approximately 25 metres) of the find and notify the project manager.
- The project manager should arrange for a number of photographs that capture the general context and specific details of the find to be taken, and where practical delineate and protect the find with appropriate high-visibility fencing – no further interference must occur with the find or within the protected area. Only construction that is required to comply with occupational and environmental health and safety standards and/or to protect the cultural heritage would occur. Inform all site personnel of this protected area.
- The project manager should inform the relevant RMS regional environment staff, Senior Environmental Specialist (Heritage), and the Aboriginal Cultural Heritage Advisor (Northern Region).
- If the find is reasonably suspected to be human remains, proceed directly to notifying local police.
- A suitably qualified and experienced archaeologist should be engaged to inspect the find, conduct a preliminary assessment and prepare an archaeological management plan.

- The Aboriginal Cultural Heritage Advisor (Northern Region), or the archaeologist will also make contact with the registered Aboriginal parties to notify them of the find and invite them to take part in the site inspection and assessment of the finds, as well as taking part in preparing any management strategies and plans for any objects discovered.
- Subject to the archaeologist's assessment, work can recommence at a set distance from the find, determined by the archaeologist. This is to protect any other archaeological material that may exist in the vicinity, which has not yet been uncovered – existing protective fencing may need to be adjusted to reflect the newly assessed protected area. No works are to take place within this area until further written notice from the archaeologist/project manager.
- The archaeologist must prepare an archaeological management plan in accordance with the RMS Unexpected Archaeological Finds Procedure (RMS 2011c) shortly after the site inspection.
  - In preparing the management plan, the archaeologist with the assistance of RMS regional environment staff must review the Construction Environmental Management Plan, any heritage sub-plans, any conditions of project approval and heritage assessment documentation (eg this report). Discussions should occur with design engineers to consider if re-design options exist and are appropriate.
  - The management plan must be submitted to the project manager as a letter, brief report, or email within two working days.
  - In accordance with the RMS Unexpected Archaeological Finds Procedure (RMS 2011c), notify OEH to inform them of any find (eg submit an AHIMS site card), including the archaeological management plan.
- Reviews of the archaeological management plan and notification must occur in accordance with RMS Unexpected Archaeological Finds Procedure (RMS 2011c).
- Assess whether heritage impact is consistent with the project approval or if project approval modification is required from the Department of Planning and Infrastructure.
- Implement the archaeological management plan.
- Ensure all archaeological work has been completed prior to RMS project work resuming – written clearance to resume work from the archaeologist, RMS regional environment staff, and if necessary OEH.

#### **9.4.2. Notification and reporting of incidents that breach this management plan**

- Incident reporting requirements in accordance with Project Approval would include Aboriginal heritage.
- Where the RMS reasonably suspects that an incident has occurred that contravenes the management plan presented here, the project incident management system will be followed.

# PUBLIC

Woolgoolga to Ballina Pacific Highway Upgrade  
Aboriginal Heritage Assessment – Iluka Road to Woodburn  
Volume 1: Cultural Heritage Assessment Report

## 10. References

- Andrews, G, Daylight, D and Hunt, J 2006, *Aboriginal Cultural Landscape Mapping of Coastal NSW*, Report to the Comprehensive Coastal Assessment (Department of Planning) by the Department of Natural Resources, Sydney.
- Australian Government 2011, *Native Title Act 1993*, Australian Government, <http://www.comlaw.gov.au>.
- Australian Government, Department of Sustainability, Environment, Water, Population and Communities 2012, *Environmental Protection and Biodiversity Conservation Act 1999*, Australian Government, <http://www.comlaw.gov.au>.
- Australian Government, Heritage Division 2005, *Aboriginal and Torres Strait Islander Heritage Protection Act 1984*, Australian Government, <http://www.comlaw.gov.au>.
- Australian ICOMOS 1999, *The Burra Charter: The Australia ICOMOS charter for places of cultural significance*, accessed 21 Jan 2011 at [www.australia.icomos.org/publications/charters/](http://www.australia.icomos.org/publications/charters/).
- Ballina Shire Council 2004, *Wardell Community Based Heritage Study*, Ballina Shire Council, Ballina.
- Belshaw, J 1966, *The Economic Basis of Aboriginal life in Northern NSW in the 19th Century*, BA (Hons) Thesis, Armidale: University of New England.
- Binns, R and McBryde, I 1972, *A Petrological Analysis of Ground Edge Artefacts from Northern New South Wales*, Canberra: Australian Institute of Aboriginal Studies.
- Bray, J 1901, 'Tribal Districts and Customs', *Science*, 4:1, 9.
- Bundock, M 1898, *Notes on the Richmond River Blacks*, typescript, Mitchell Library.
- Burke, H 1997, *The History of Corindi Lake: A Joint Project between the Yarrowarra Aboriginal Corporation and the University of New England*. Report held by the Yarrowarra Aboriginal Corporation.
- Byrne, D 1981, *Archaeological Survey of the Grafton – Lismore Transmission line*, Unpublished report to the NSW NPWS.
- Byrne, D 1985, *Aboriginal Sites in Ulmarra Shire: A Background for Site Management*, Unpublished report to NPWS (NSW) for Ulmarra Shire Council.
- Byrne, D 1986, *Aboriginal Archaeological Sites in the Shire of Maclean: A Heritage Study*, Unpublished report prepared for the Council of the Shire of Maclean.
- Coleman, J 1982, 'A New Look at the North Coast: Fish Traps and Villages', in *Coastal Archaeology in Eastern Australia*, Ed: Bowdler, S, Canberra: Australian National University, pp 1-10.

# PUBLIC

Woolgoolga to Ballina Pacific Highway Upgrade  
Aboriginal Heritage Assessment – Iluka Road to Woodburn  
Volume 1: Cultural Heritage Assessment Report

- Collins, J 2005, *Upgrading the Pacific Highway Woodburn to Ballina Route Selection Study: Aboriginal Heritage Assessment*, Unpublished report to Hyder Consulting.
- Collins, J 2008, *Iluka Road to Woodburn: Aboriginal Heritage Assessment – Working Paper*, Unpublished report to Connell Wagner.
- Colony of Victoria, 2012, *Aborigines Protection Act 1869*, Museum of Australian Democracy, <http://foundingdocs.gov.au/item-sdid-22.html>
- Craib, J 1992, *A Reconnaissance survey of Aboriginal Archaeological resources in the Wentworth-Gol Gol Area, Western NSW*. Unpublished report to National Parks and Wildlife Service NSW.
- Craib, J and Bonhomme, T 1995, *Coffs Harbour - Nambucca - Kempsey- 132 kV Transmission Lines: a desktop assessment of Aboriginal and European Heritage*, unpublished report to TransGrid.
- Crowley, T 1978, *The Middle Clarence Dialects of the Bandjalang*, Canberra: Australian Institute of Aboriginal Studies.
- Crowley, T 1997, 'Chipping Away at the Past: A Northern NSW perspective', in *Archaeology and Linguistics*, Eds: McConville, P and Evans, N, Oxford University Press, pp 275-296.
- Dawson, R L, 1935, *Early Days in the Richmond District*, Richmond River Historical Society, typescript, nd.
- DEC 2005, *Interim Community Consultation Requirements for Applicants*, viewed 26 September 2010, <http://www.environment.nsw.gov.au/resources/cultureheritage/interimConsultationGuidelines.pdf>.
- DECCW 2010, *Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010 (ACHCRP)*, Department of Environment, Climate Change and Water, <http://www.alc.org.au/media/43239/1004%20deccw%20community%20consultation%20requirements.pdf>.
- DECCW 2010, *Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales 2010*, Department of Environment, Climate Change and Water, <http://www.environment.nsw.gov.au>.
- DECCW 2010, *Due Diligence Code of Practice for the Protection of Aboriginal Objects in New South Wales 2010*, Department of Environment, Climate Change and Water 2010, <http://www.environment.nsw.gov.au>.
- DPI, New South Wales 2007, *Mining by Aborigines - Australia's first miners*, Primefact 572.
- Flick, W 1934, *A Dying Race*, Ballina: Beacon Printery.
- Godwin, L 1990, *Inside Information: Settlement and Alliance in the Late Holocene of Northeastern New South Wales*, Unpublished PhD Thesis, Armidale: University of New England.

- Gollan, K and Bowdler, S 1983, *Aboriginal Sites on the Crown-timber Lands of the Bathurst Management Area, New South Wales*, Unpublished report to the Forestry Commission of New South Wales.
- Hall, R and Lomax, K 1993, *An archaeological assessment of the Grafton management area*, Unpublished report by the Forestry Commission of New South Wales.
- Hoddinott, W C 1978, 'The Languages and Myth of the New England Area', in *Records of Times Past*, Ed: McBryde, I, Canberra: Australian Institute of Aboriginal Studies, pp 52-64.
- Hoff, J 2010, *Bundjalung Jagun: Bundjalung Country*, Richmond River Historical Society Inc, Lismore.
- Holdaway, S and Stern, N 2008, *A record in stone: The study of Australia's flaked stone artefacts*, Museum Victoria and Aboriginal Studies Press, Melbourne.
- Keary, P 2001, *Dictionary of geology*, Second Edition, Penguin Group, London.
- Kuskie, P 2008, *Woolgoolga to Wells Crossing: Aboriginal Heritage Report – Working Paper*, Unpublished report to GHD Pty Ltd and RTA.
- Maiden, J H 1889, *Useful Native Plants of Australia*, London: Trubner and Co.
- McBryde, I 1982, 'Subsistence Patterns in New England Prehistory', *Occasional Papers in Anthropology*, 6, 48-68.
- Navin, K and Officer, K 1990, *Archaeological Survey of Proposed 330KV Transmission Line from Coffs Harbour to Koolkhan (Grafton), NSW*, Unpublished report to the Electricity Commission of NSW.
- Navin Officer 2009a, *Wells Crossing to Iluka Road Upgrading the Pacific Highway: Concept Design Report Cultural Heritage Working Paper*, Unpublished report to Sinclair Knight Merz Pty Ltd.
- Navin Officer 2009b, *Upgrading the Pacific Highway, Glenugie Upgrade: Appendix E – Working paper: cultural heritage*, Report to SKM on behalf of RTA.
- NSW Department of Planning 2012, *Environmental Planning and Assessment Act 1979*, NSW Wales Government, <http://www.legislation.nsw.gov.au>.
- NSW Government 2012, *Aboriginal Land Rights Act 1983*, NSW Government, [http://www.austlii.edu.au/au/legis/nsw/consol\\_act/alra1983201/](http://www.austlii.edu.au/au/legis/nsw/consol_act/alra1983201/)
- NSW Government 2012, *Native Title Act (NSW) 1994*, [http://www.austlii.edu.au/au/legis/nsw/consol\\_act/ntswa1994319/](http://www.austlii.edu.au/au/legis/nsw/consol_act/ntswa1994319/). Oakes, 1979, In Herons report on Cult/Hert Values relating to Lismore City Council LGA, Lismore.
- OEH 2012, *National Parks and Wildlife Act 1974*, NSW Wales Government, <http://www.legislation.nsw.gov.au/>.
- OEH 2012, *National Parks and Wildlife Amendment Act 2010*, NSW Wales Government, <http://www.legislation.nsw.gov.au/>.

# PUBLIC

Woolgoolga to Ballina Pacific Highway Upgrade  
Aboriginal Heritage Assessment – Iluka Road to Woodburn  
Volume 1: Cultural Heritage Assessment Report

- OEH 2012c, *Native Title (NSW) Act 1994*, NSW Government,  
[http://corrigan.austlii.edu.au/au/legis/nsw/consol\\_act/ntswa1994319/](http://corrigan.austlii.edu.au/au/legis/nsw/consol_act/ntswa1994319/)
- Peterson, N 1976, *Tribes and Boundaries in Australia*, Canberra: Australian Institute of Aboriginal Studies.
- Petrie, C 1904, *Tom Petrie's Reminiscences of Early Queensland*, Brisbane: Watson, Ferguson & Co.
- Pierce, R G 1971, *The Effects of Aquatic Foods on the Diet and Economy of the Aborigines of the North Coast at the Time of First Settlement*, BA(Hons) Thesis, University of New England.
- Piper, A 1982, *A Preliminary Archaeological Survey of Aboriginal Sites Affected by the Alternative Proposals for a 66,000 Volt Transmission Line. Iluka New South Wales*. Unpublished report for the Northern Rivers County Council, Grafton.
- Radcliffe-Brown, A R 1929, *Aborigines and Europeans in the Northern Rivers Region of New South Wales 1823-1881*, Unpublished Ph.D. Thesis, School of Historical, Philosophical and Political Studies, Macquarie Park: Macquarie University.
- Rich, E 1989, *Aboriginal History of North East NSW: Stage 1*, Unpublished report for the NSW National Parks and Wildlife Service.
- RMS 2011, *Procedure for Aboriginal and Cultural Heritage Consultation and Investigation*, Roads and Maritime Services, Sydney.
- RMS 2011, *Upgrading the Pacific Highway: Woolgoolga to Ballina Upgrade. Project definition, standard terms and editorial style guide*, Electronic report for SKM.
- RMS 2011c, *Standard Management Procedure: Unexpected Archaeological Finds*, Roads and Maritime Services,  
[http://www.rta.nsw.gov.au/environment/downloads/unexpected\\_archaeological\\_finds\\_procedure.pdf](http://www.rta.nsw.gov.au/environment/downloads/unexpected_archaeological_finds_procedure.pdf)
- Rowan, J 1990, *Land Systems of Victoria*, Department of Conservation and Environment and Land Conservation Council.
- Simpson, J 1956, *Letter to LT Daley*, Manuscript, Lismore: Richmond River Historical Society.
- Tindale, N B 1940, 'Australian Aboriginal Tribes: A Field Survey', *Transactions Royal Society of SA*, No 64.
- UNESCO 1991, *World Heritage Convention*, viewed 26 September 2010,  
<http://whc.unesco.org/en/conventiontext>.
- United Nations 2012, *Declaration on the rights of Indigenous Peoples*,  
[http://www.un.org/esa/socdev/unpfii/documents/DRIPS\\_en.pdf](http://www.un.org/esa/socdev/unpfii/documents/DRIPS_en.pdf).
- Winterbotham, L P 1983, 'The Gaiarbau Story', *Queensland Ethno-history Transcripts 1*, Ed: Langevad, G, 1:1, 21 -111.





# **Appendix A Aboriginal Archaeological Assessment Report**

## 1. Introduction

This archaeological assessment forms the second volume to the Aboriginal cultural heritage assessment report (CHAR) for the project between Iluka Road and Woodburn of the Woolgoolga to Ballina Pacific Highway upgrade project (the 'project').

The purpose of this report is to present the process, results and discussion of the archaeological assessment undertaken as part of the CHAR between Iluka Road and Woodburn. The assessment has been undertaken with regard for the Department of Environment, Climate Change and Water (DECCW) Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales 2010.

Project information, significance assessment, impact assessment and management recommendations are all contained within Volume 1 of this report. Additionally, a summary of information and results contained in this archaeological assessment is also included in Volume 1.

This archaeological assessment has the following basic structure:

- Chapter 1: Introduction.
- Chapter 2: Desktop assessment – develops the background information further from that presented in Volume 1, including specific information on previous archaeological investigations and development of a predictive model that aims to identify landforms with sensitivity for Aboriginal cultural heritage sites.
- Chapter 3: Field survey – describes the methods and outcomes of the field survey conducted to identify Aboriginal cultural heritage sites and potential archaeological deposits (PADs).
- Chapter 4: Sub-surface testing – explains the approach taken, process and results of the sub-surface test excavation program undertaken to explore the presence, nature and extent of sub-surface archaeological deposits.
- Chapter 5: Archaeological sites – presents analysis and discussion on the sites within the boundary of the project between Iluka Road to Woodburn.
- Chapter 6: Significance assessment.
- Chapter 7: Impact assessment.
- Chapter 8: Management recommendations.

It should be noted that the consultation undertaken for this archaeological assessment (with regard for the Office of Environment and Heritage (OEH) Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010) is described in Volume 1 (the CHAR).

## 2. Review of background information

### 2.1. Introduction

The region around the project is relatively poorly studied in regards to the archaeology of Aboriginal occupation. Previous archaeological investigation in the region has focussed more on the coast and has generally been conducted for transmission lines, and the occasional local council study, giving reasonable overviews of the area, but few more specific investigations.

The archaeological assessment methodology used the available information to develop a predictive model. This Chapter specifically draws information from previous investigations that have been undertaken within the region of the project and previous investigation undertaken for the project (Collins 2008). The predictive model developed in section 2.1.1 draws on the information from previous investigations as well as the following Chapters from Volume 1:

- Historical context (Volume 1, Chapter 4).
- Existing environment (Volume 1, Chapter 4).
- Aboriginal cultural assessment (Volume 1, Chapter 5)
- Previously recorded cultural heritage sites (Volume 1, Chapter 4).

#### 2.1.1. Previous investigations in the boundary of the project between Iluka Road and Woodburn

Collins (2008) conducted an Aboriginal heritage assessment of the project, between the township of Woodburn and Iluka Road, Woombah. A total of five archaeological sites were identified within Collins' (2008) study area and comprise three isolated stone artefacts, a low-density stone artefact scatter and an engraved (scarred) tree. Furthermore, a previously registered burial (Sawpit Creek Burial, Aboriginal heritage information management system [AHIMS] ID13-1-059) is located within the boundary of the project. The isolated artefacts were identified on the crest of a ridgeline, the upper slope of a ridge and on a creek bank. The low density artefact scatter was identified on the upper slope and crest of an undulating ridgeline. The stone artefacts were manufactured from petrified wood, siltstone, chert, tuff, greywacke and chalcedony. The burial (Sawpit Creek Burial, AHIMS ID 13-1-059) is located on a hill south of The Gap Road. No information regarding the landform associated with the scarred tree was provided.

#### 2.1.2. Previous Aboriginal archaeological investigations within and near the boundary of the project between Iluka Road and Woodburn

Navin Officer (2009) conducted an Aboriginal heritage assessment for the proposed Pacific Highway upgrade for the section between Wells Crossing and Iluka Road, Woombah. A search of

the AHIMS within a 62 kilometre by 22 kilometre area (including the boundary of the project) identified two previously recorded open camp sites (artefact scatters) within the vicinity of the boundary of the project. No Aboriginal sites were identified during the survey in their study area; however, eight PADs were recorded. In addition, several places of cultural significance were also identified.

Hall and Lomax (1993) conducted an Environmental Impact Assessment for the Casino district forests in the Richmond hinterland. In the coastal ranges, artefacts were most commonly found on the crests of ridges and low spurs, although some occurred on slopes, flats and plains. All of the sites (n=19) contained less than 13 visible artefacts and 16 were isolated finds. Only three isolated finds were recorded in the lowlands, one on a plain, one on a lower slope and one on a low ridge, at distances of over 600 metres from the nearest water source. The comparative low density and low occurrence of Aboriginal sites in the coastal ranges and lowlands was attributed to the reduced availability of suitable raw materials and a general lack of occupation along drainage and ridge lines.

Byrne (1981) conducted a cultural heritage assessment of the proposed 330 kilovolt electricity line between Grafton and Lismore, for the Electricity Commission of NSW. Isolated stone artefacts were identified in two locations. The first artefact consists of an orange-brown quartzite flake embedded in a low bank at the edge of a recently cultivated paddock. The second artefact consists of a coarse grained silcrete core tool identified on sloping ground. A total of three stone artefact scatters were also identified during the survey and consists of chert, quartzite, quartz, silcrete artefacts identified on spurs, slopes and ridges.

Piper (1982) conducted a cultural heritage assessment of a proposed 66 kilovolt transmission line near Iluka for the Northern Rivers County Council. A total of two Aboriginal sites were identified during the survey and consist of an artefact scatter and shell midden. The artefact scatter consists of four chalcedony flakes scattered along the rim of a sand deflation along the edge of Iluka Road. The shell midden consists of exposed shell deposit eroding from a vegetated sand ridge between Iluka Road and the Clarence River.

Byrne (1985) produced a background report for the management of Aboriginal archaeological resources in the Ulmarra Shire Council. Byrne (1985) assessed the archaeological potential of the four landforms within the study area (floodplain, riverine, uplands and coast and coastal wetlands) and predicted the Aboriginal site types that would exist within these areas:

- Floodplain: Open sites consisting of stone artefact scatters will be the most common Aboriginal site type and will be located on high ground in and around the periphery of the floodplain. A previously recorded bora ground and burial site indicate that there is a likelihood of find other such sites in this region. Due to the depositional environment of the floodplain, most sites are likely to be covered to some extent by alluvium.
- Riverine: There is a clear association between Kangaroo Creek Sandstone and rockshelter occupation / art sites along the Orara River. Open campsites may also be identified along the length of the Orara especially on the flat tops of spurs running down to bends in the river. Stone arrangements and bora grounds may also exist along the length of the Orara. Site density will be lower along watercourses draining into or through the floodplain due to poor drainage conditions.
- The Uplands: Open camp sites may be identified on flat positions such as saddles and along the tops of ridges. Rockshelters may also be identified in the Kangaroo Creek Sandstone

which occurs within the coastal ranges. Bora grounds and stone arrangements may also be found in the upland zone.

- **Coast and Coastal Wetlands:** Middens will be the most common site type and may be located between beaches and swamps in order to draw on the resources of both environments. Middens may also be identified west of backdunes on the margins of floodplain swamps, albeit on relatively high and well-drained surfaces. Stone artefact scatters may be identified in similar environments as shell middens as well as the ridges and spurs of dry sclerophyll country along the coast. Finally, small fish traps and burials may also occur within the region.

**Table 2-1 Previous archaeological investigations in general proximity to the boundary of the project**

Reference	Aboriginal sites	Results / conclusions
Gollan and Bowdler 1983	Numerous	Relatively few Aboriginal sites are recorded in the forest environment of the Crown timberlands of the north coast of New South Wales (NSW).
Navin and Officer 1990	39 Artefact scatters 4 Scarred trees 4 Rock shelters 3 Quarry sites (silcrete) 6 Isolated finds	Fewer sites were identified on the lowland hills compared to the rangelands. The authors attributed this to the effects of European land-use and aggrading landforms. Furthermore, stream flats and elevated ground adjacent to wetlands or floodplains was considered the most archaeological sensitive locations with the exception of rock shelters.

## 2.2. Predictive model for site type and distribution

It is commonly recognised that archaeological sites tend to occur in favourable environmental settings. Predictive models use these patterns to identify the environmental characteristics of places where sites are more likely to occur. Craib (1992: 10) states that:

“The goal of predictive models is to correctly identify important aspects of the natural and/or social environment that influenced the location of human activities, and to interpret the archaeological record as the result of a set of functional, temporal, spatial and behavioural responses to a varied environment.”

Providing the available data is reliable, it is possible to extrapolate from a relatively small sample of known locations and apply to a much broader but similar landscape area (Collins 2008).

The predictive model applied to this study was based on a ‘land system’ or ‘archaeological landscape’ model of site location. This enables the prediction of site location based on known patterns of site distribution in similar land systems or archaeological landscapes. To ensure that the predictive model was specific, the predictive model presented here was developed by defining further specific landscape characteristics, where possible, within each land system. High risk landforms that are likely to contain Aboriginal archaeological sites were then highlighted within each of these landscape characteristics. Each high risk landform was assigned an archaeological sensitivity rating based on:

- Ethnohistory and cultural knowledge (refer to Chapter 4 and Chapter 5).

- Previous impacts to the landform and the potential effects of these impacts on the archaeological record (refer to Chapter 4).
- Previous models developed for the project and surrounds (Appendix G).
- Previous survey results in and adjacent to the boundary of the project (Appendix G).
- Distribution patterns of known sites and site types in each landform (as previously discussed above and in Chapter 6).

Archaeological sensitivities assigned to landforms were low (L), low-moderate (L-M), moderate (M), moderate-high (M-H) and high (H) based on previous findings and average levels of ground disturbance across the landforms. These sensitivities essentially reflect the degree of likelihood for particular site types to be found within them.

Table 2-2 shows the predictive model for Aboriginal archaeological sites within the boundary of the project. It should be noted that sensitivity ratings in Table 2-2 relate to the likelihood of finding Aboriginal archaeological sites, not necessarily the significance of any site found there. As there are few records of the sub-surface nature of archaeological sites across the project, the predictive model is consequently skewed towards extrusive (surface) and shallow, eroding sites.

The location of archaeological sites within the landscape is not caused by pure environmental determinism. It is also important to note that cultural preferences may increase the likelihood of archaeological material or unidentified cultural places in or around the boundary of the project in areas not accounted for in the predictive model.

Recent geographic information system (GIS) predictive modelling undertaken by the OEH is also useful to review here. This model is based on the locations of sites registered on the AHIMS within specific landforms and accounts for the accumulated impact of post 1750 land use impacts (Appendix G)<sup>1</sup> on specific site types.

Appendix G includes a series of maps previously provided by OEH that show the results of this predictive modelling of the region around the project for a range of site types (artefact sites, scarred trees, shell middens, and burials). Land impacts in the region are an important part of this modelling. For example, logging will have a significant impact on the distribution of scarred trees, but a more moderate impact on artefact scatters. This modelling is useful as a supplementary overview of the project and surrounding region, and generally accords with Table 2-2, however the model may not be sensitive enough to capture smaller scale variability. The predictive model presented in Table 2-2 is designed to account for this variability.

---

<sup>1</sup> For more information on the basis of this modelling, see <http://www.environment.nsw.gov.au/licences/AboriginalSitesDecisionSupportTool.htm>.

**Table 2-2 Landforms where Aboriginal archaeological sites are likely to occur within the boundary of the project between Iluka Road and Woodburn**

Project section	Land system	Specific landscape characteristics	Location within / near the boundary of the project	Landforms with high probability of containing Aboriginal sites	Sensitivity rating	Likely site types	Characteristics of landforms influencing probability
6	Clarence River Valley	Clarence River floodplain consisting of an undulating plain of low rises, levees, terraces and depressed flood channels.	Southern end of boundary of the project, around Iluka Road	Raised areas of alluvial deposits.	Low-Moderate	Isolated stone artefacts, small stone artefact scatters and scarred trees.	Aboriginal sites may be concealed by aggrading alluvium.
6, 7, 8	Tabbimoble Rises	Low hills and undulating rises up to 40 m above sea level.	South of Woodburn and within the Richmond River Ranges to just north of Iluka Road	Flatter areas of mid-slopes, ridges and spur crests.	Moderate	Isolated stone artefacts, small stone artefact scatters.	Disturbance due to road construction, logging and other pastoral activities.
6		Lowland areas with elevations of less than 10 m above sea level consisting of alluvial floodplains, back swamps and drainage channels.	South of Woodburn and within the Richmond River Ranges to just north of Iluka Road	Margins of larger streams and swamps on flatter areas of well-drained foot slopes and banks.	Moderate	Isolated stone artefacts, small stone artefact scatters, and scarred trees.	Disturbance due to road construction, logging and other pastoral activities.
8	Richmond Alluvial Plain	Alluvial plain of low lying flat terrain, approximately 5 metres above sea level. Area has been drained, cleared and extensively cultivated.	Woodburn to Ballina: Richmond River	Locally elevated rises, particularly those on swamp/forest ecotones and the banks of swamps and estuaries.	L-M	Stone artefact scatters and isolated artefacts	Erosion and disturbance in the historical period due to land-clearance.

## 2.2.1. Expected site types within the boundary of the project

The predictive model for site types developed for the region (Table 2-2) indicates that certain site types are more likely to be prevalent in the landscape. The degree of preservation and intactness will vary dependent on historical and current land use and the nature of the site. The maps generated from the predictive model (Appendix G) show that there has been substantial disturbance of Aboriginal archaeological sites within the boundary of the project from post-1750 land-use practices. This is particularly pronounced for scarred trees, burials and shell middens. However, the model outputs also show that sites may persist within a number of areas both within and outside the boundary of the project.

Site types likely to remain within the boundary of the project are described in Table 2-3.

**Table 2-3 Summary of potential site types within the boundary of the project between Iluka Road and Woodburn**

Site type	Description
Artefact scatters	<p>Artefact scatters are the most likely sites to have survived in the archaeological record, due to the durability of their contents (predominantly stone). They are scatters of stone artefacts, occasionally with associated food material such as shell and bone. Areas subject to higher degrees of impact, such as from sugar cane farming or sand quarrying will be unlikely to preserve intact archaeological deposits, but may retain artefacts in a disturbed context. Consequently, intact archaeological deposits/sites are less likely to be found in these disturbed areas.</p> <p>The most likely places for artefact scatters or isolated artefacts within the boundary of the project are on terraces or low, flat spurs adjacent to and above swamps or permanent creeks, and occasionally on ridgelines that may have been pathways.</p>
Scarred and carved trees	<p>Scarred trees are identified by the purposeful removal of bark for use in the manufacture of artefacts such as containers, shields and canoes. The bark was also used for the construction of shelters. Carved trees also exhibit evidence of purposeful removal of bark but differ from scarred trees in that geometric patterns and figures are cut into the tree. The motifs of the mid-north coast region are mostly linear geometric patterns (Craib and Bonhomme 1995: 27).</p> <p>Although it is likely that scarred/carved tree sites would have been present in the boundary of the project in the past, the fact that there has been heavy clearing of old growth timber within and around the boundary of the project implies a low potential for this site type to be located. The maps in Appendix G support this notion, showing that there is a significant difference between the pre-contact (1750) predicted condition of the likelihood of scarred trees within and around the boundary of the project, and the current predicted condition (accounting for accumulated impact).</p>
Burial sites	<p>Burials are most commonly found in soft sandy, alluvial deposits. This tends to be because such conditions (ie light easily dug soil) facilitate interment. Burial locations are sometimes marked by carved trees. The designs on these trees were usually geometric patterns and may have signified the totemic kinship affiliations of the deceased.</p>



Site type	Description
Shell midden sites	<p>These are common along the coast, and in estuarine and creek areas. The term midden is a Danish word meaning a mound of kitchen refuse. In archaeological terms, a midden refers to an accumulation of shell deposited after people had collected and eaten shellfish. Middens may also contain faunal remains, stone artefacts and charcoal from cooking fires. In many areas, burials have been recorded in direct association with midden deposits. Midden sites vary widely in size, preservation and content.</p> <p>The most likely locations for middens in the boundary of the project are in the vicinity of river and creek banks and swamps, such as Evans River, Richmond River, Clarence River, Shark Creek, Corindi Creek and Halfway Creek.</p>
Bora/Ceremonial sites	<p>These are usually identified as flat mounded earth rings which were used for ceremonial activities. The nature of these sites makes them particularly susceptible to impact, such as from ploughing, cane farming and logging. These sites are often known only from the oral traditions of local Aboriginal groups. Several bora rings exist or were known to have existed in the proximity of the study area, for example near Bingall Creek and just outside the boundary of the project around Cooks Hill.</p>
Natural/ Mythological/ Ritual sites	<p>These may not exhibit any physical or archaeological evidence, but their identification is derived from local Aboriginal tradition and oral history. These sites often have mythological associations and are associated with ceremonial activity in the past. These sites are sometimes prominent landmarks, such as mountains, rivers, rocky outcrops, and headlands (eg Glenugie Peak, the Clarence and Richmond Rivers).</p> <p>A myriad of landscape factors as well as intangible cultural and social factors, influence where these sites are located. Consequently, it is very difficult to predict where currently unknown natural, mythological and/or ritual sites may be located, although they may be more likely to occur in landforms of high archaeological sensitivity. Consultation with relevant knowledge holders is usually required to locate these sites.</p>
Stone arrangements	<p>In the Mid-North Coast of NSW, stone arrangements usually consist of cairns and/or alignments of rocks. These features are considered by Gumbaynggir people as having ceremonial significance and are often found in relatively high and/or inaccessible places such as mountain peaks and coastal headlands.</p> <p>The most likely locations for these sites would be in the ranges surrounding the boundary of the project, and are thus unlikely to occur within the boundary of the project.</p>
Waterholes or Wells	<p>Waterholes or wells can be any natural or excavated water retaining feature of either historic or prehistoric significance. In order to be considered as an archaeological site, there should be some evidence of modification or use of the site.</p> <p>The most likely locations of waterholes or wells are within the ranges surrounding the boundary of the project. The underlying sandstone of the boundary of the project would be unsuitable for waterhole modification; consequently, there is little likelihood of waterholes being located within the boundary of the project.</p>

## 3. Field survey

### 3.1. Introduction

The team undertook the archaeological survey for the project between Iluka Road and Woodburn between August 2010 and December 2011. The technical requirements for the survey standards are set out in the OEH Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales 2010 and these were referred to prior to commencing works.

### 3.2. Previous surveys

Prior to the field survey undertaken for this report, survey was undertaken by Collins (2008) for the concept plan stage of the Iluka Road to Woodburn Pacific Highway upgrade project. Through community consultation and analysis of the report it was determined that approximately 60 per cent of the boundary of the project (corrected to account for previously significantly disturbed areas) had been subject to previous survey and would not require further survey. This meant that the remaining 40 per cent of the boundary of the project required survey.

### 3.3. Survey aims

The primary aims of the archaeological survey were:

- To improve the survey coverage of the boundary of the project.
- To identify sites and areas of PADs within the boundary of the project.
- To collaborate and consult with registered Aboriginal stakeholders.

Priority areas identified for archaeological survey comprised areas which had not been previously surveyed. A secondary aim of the archaeological survey was to undertake consultation along the boundary of the project with nominated Aboriginal site officers representing the registered Aboriginal stakeholders. The objective of their participation was to:

- Obtain any information relating to cultural heritage sites (archaeological and cultural) along or adjacent to the boundary of the project.
- Understand Aboriginal significance of sites or PAD located during the field survey.
- Discuss preliminary recommendations for Aboriginal sites and PADs located within the boundary of the project during the field survey.
- Discuss recommendations for further archaeological assessment of PADs located during the field survey.
- Discuss recommendations for further archaeological assessment of PADs located during the field survey.

## 3.4. Survey timing and personnel

The archaeological survey was undertaken on the following dates:

- 23 to 27 August 2010.
- 24 to 27 August 2011.
- 4 to 7 October 2011.
- 25 October to 22 December 2011 (Various dates throughout the sub-surface test excavation program).
- 7 March 2012.

The field teams comprised project team archaeologists and nominated Aboriginal site officers representing registered Aboriginal stakeholders (Table 3-1). A mix of male and female archaeologists was incorporated into the field team to allow for potential Aboriginal stakeholder preferences when sharing cultural information.

Well defined boundaries exist for Local Aboriginal land councils (LALCs), which have been developed for the most part by government agencies to assist with health, housing and other matters. However, these boundaries do not necessarily reflect traditional Aboriginal tribal or clan boundaries. Consequently, Aboriginal communities have their own views about their cultural affiliations to the landscape. Where possible, the archaeology team enabled the registered Aboriginal stakeholders to speak for themselves as to which parts of the boundary of the project they assumed cultural heritage responsibility for via the Aboriginal focus group meetings (AFG).

This methodology worked well with Birrigan Gargle and Yaegl LALC stakeholders (both part of the Yaegl People Native Title claim) working together within the Yaegl LALC boundary and into the Unincorporated LALC lands.

In the Unincorporated LALC area, Jali, Yaegl, Birrigan Gargle, Bogal and Ngulingah LALCs and Bandjalang Native Title Claimants have joint responsibility over the country and were consulted with equal measure for this country on shared cultural values. As Ngulingah LALC had no representatives available at the time of survey, they gave permission for Jali LALC to participate on their behalf.

**Table 3-1 Survey personnel (Iluka Road to Woodburn)**

Organisation	Name	Role	Dates of participation
Yaegl LALC (also Yaegl People Native Title claim)	Mark Laurie	Trainee Aboriginal Site Officer	25-27 August 2010
Yaegl LALC (also Yaegl People Native Title claim)	Lee Laurie	Senior Aboriginal Site Officer	24-27 August 2010 4-6 October 2011
Yaegl LALC (also Yaegl People Native Title claim)	Dale Mercy	Aboriginal Site Officer	4-6 October 2011
Yaegl LALC (also Yaegl People Native Title claim)	Shane McLeay	Aboriginal Site Officer	4-6 October 2011

# PUBLIC

Woolgoolga to Ballina Pacific Highway Upgrade  
Aboriginal Heritage Assessment – Iluka Road to Woodburn  
Volume 2: Appendices

Organisation	Name	Role	Dates of participation
Birrigan Gargle LALC (also Yaegl People native title claim)	Fox Laurie	Senior Aboriginal Site Officer	24-27 August 2010 4 October 2011
Birrigan Gargle LALC (also Yaegl People Native Title claim)	Ronald Williams	Trainee Aboriginal Site Officer	25-27 August 2010
Birrigan Gargle LALC (also Yaegl People native title claim)	Malcolm Brown	Aboriginal Site Officer	4-6 October 2011
Birrigan Gargle LALC (also Yaegl People native title claim)	Kurtis Laurie	Aboriginal Site Officer	4-6 October 2011
Jali LALC	Dean Bolt	Senior Aboriginal Site Officer	24-25 August 2010 2-4 August 2011 4 October 2011
Jali LALC	Marcus Ferguson	Senior Aboriginal Site Officer	23-24 August 2010 2-4 August 2011 4 October 2011
Bogal LALC	Steven Williams	Senior Aboriginal Site Officer	27 August 2010
Bogal LALC	Daryl Knight	Senior Site Officer	4 October 2011 7 March 2012
Bogal LALC	Daniel Wilson	Aboriginal Site Officer	7 March 2012
Bogal LALC	Doug Wilson	Aboriginal Site Officer	7 March 2012
Bogal LALC	Hannel Duncan	Aboriginal Site Officer	7 March 2012
Burabi Aboriginal Corporation	Lois Cook	Senior Aboriginal Site Officer	2-4 August 2011
Burabi Aboriginal Corporation	Dwayne Cook	Trainee Aboriginal Site Officer	2-4 August 2011
SKM	Robyn Jenkins	Supervisor / Archaeologist	23-27 August 2010
SKM	Vanessa Edmonds	Supervisor/ Archaeologist	23-27 August 2010 7 March 2010
SKM	Andrew Costello	Supervisor/ Archaeologist	23-27 August 2010 2-4 August 2011 4-7 October 2011
SKM	Joseph Brooke	Supervisor/ Archaeologist	23-27 August 2010 2-4 August 2011 4-7 October 2011
SKM	Rani Attwood	Archaeologist	23-27 August 2010
SKM	Erica Weston	Archaeologist	4-7 October 2011
SKM	Clair Davey	Archaeologist	7 March 2012

## 3.5. Survey methodology

The field program focused approximately on the 40 per cent of the boundary of the project which had not previously been surveyed, and areas where design changes had occurred. The methodology for the survey followed a standard approach:

- Survey areas were defined on the basis of landholder information. A survey area was constituted by a block of land with unique property information in a previously un-surveyed area within the boundary of the project.
- Property access limited the areas that could be surveyed. Therefore, the sampling strategy developed was to survey as many properties as possible within the boundary of the project, which had not previously been subject to survey.
- Two teams of archaeologists and Aboriginal site officers undertook a pedestrian survey in five metre to 10 metre wide transects across each survey area.
- Particular attention was given to areas of where ground surface visibility was possible or where the sub-surface was exposed.
- Where property access was not available, an assessment of the survey area was made from the property boundary for Aboriginal heritage potential.
- PADs were identified through a combination of desktop landform analysis and onsite landform and geomorphological analysis, in conjunction with Aboriginal site officers.

Approximately 40 per cent of the entire boundary of the project has been significantly disturbed by previous earthmoving works and construction (predominantly, the existing and prior alignments of the Pacific Highway). In these areas there is negligible potential for any Aboriginal heritage evidence to have survived. Consequently, these areas were marked as 'significantly disturbed' and visual inspection was used to confirm that negligible potential for heritage evidence existed in these areas. The remainder of the boundary of the project comprised of land where there was varying degrees of potential for Aboriginal heritage material (as per the predictive model in Table 2-2).

Where property access was possible, the locations of all Aboriginal sites and PADs were recorded using a mobile GIS Unit (Trimble® GeoXH™ GeoExplorer® or the Trimble® Nomad). This allowed for the spatial datasets collected in the field to be post-processed to sub-metre level accuracy once the global positioning system (GPS) co-ordinates have been differentially corrected.

Ground surface visibility and any sub-surface exposures were noted for each survey area, along with other observations of the area, such as; vegetation type, previous modification/disturbance, landform and land-use.

Sites were defined on the basis of the spatial extent of visible objects and where possible, the logical boundary of the landform unit on which they lay.

## 3.6. Survey coverage

Prior to current investigations, just over half of the boundary of the project between Iluka Road and Woodburn (approximately 60 per cent) had previously been surveyed. A total of 84 per cent of the boundary of the project has now been subject to field survey (Table 3-2). The remainder of the

project is not considered a risk for cultural heritage sites or places, due to previous significant impacts, and so does not require survey, though assessment of these areas was undertaken from the property boundary to confirm low Aboriginal heritage potential.

The main constraints to survey coverage were property access permission and vegetation cover (such as heavily water-logged swamp); however, such properties were, for the most-part, still able to be assessed either from the road or an adjacent property. Where this was not possible, survey areas were assessed based on in-field consultation with sites officers and observations, topographic data, and predictive modelling.

Table 3-2 summarises the survey coverage across the boundary of the project. Maps in Appendix I show the survey coverage, while Appendix H provides details of survey areas, including visibility for each survey area from 2010-2012 survey (previous survey data can be found in Collins 2008). Survey coverage falls under the following three categories:

- Small amounts of survey which were undertaken for projects other than the Pacific Highway Upgrade Program between Iluka Road to Woodburn.
- Pre-2010 Pacific Highway upgrade program survey, which was undertaken for the project, though prior to 2010 (Collins 2008).
- 2010 - 2012 Pacific Highway upgrade program survey.

**Table 3-2 Survey coverage of the boundary of the project between Iluka Road and Woodburn, \*Note that corridor area and survey coverage have been corrected to remove significantly disturbed areas**

Land system	Corridor area (m <sup>2</sup> )*	Survey coverage in m <sup>2</sup> (%)*	Visibility (%)	Exposure (%)	Effective coverage (%)
Clarence River Valley	117,788	178,462.2196 (66)	60	10	7,067.282 (4)
Richmond Alluvial Plain	134,869	167,498.371 (81)	50	10	6,743.454 (4)
Tabbimoble Rises	2,867,939	3,366,068.626 (85)	50	10	143,396.9 (4)
<b>Total</b>	<b>3,120,596</b>	<b>3,712,029.216 (84)</b>	<b>55%</b>	<b>10</b>	<b>157,207.636 (4)</b>

Appendix H presents the survey coverage across a range of landforms within the boundary of the project, overlain on a spatial model of priority areas for survey provided by modelling from OEH. Survey priority shown on the map is based on knowledge gaps, landform sensitivity and land-use impacts. Appendix K shows that the boundary of the project transects several areas that are considered high priority survey areas, and when combined with Appendix H it can be stated that all of the high priority survey areas within the boundary of the project have now been surveyed.

Generally poor surface visibility and sub-surface exposure encountered across the boundary of the project (Table 3-2), has resulted in low effective coverage of 4 per cent.

The survey coverage summarised in Table 3-2 was comprehensive for obtrusive site types (eg scarred trees, rock shelters), but more limited for the less obtrusive site types (eg stone artefacts, middens, burials). However, these areas were identified as PADs and assessed during the sub-surface testing program (Chapter 4). The substantial survey work to date also assists in drawing broad scale conclusions on the Aboriginal values and resources in the boundary of the project and the impact the project may have.

## 3.7. Survey results

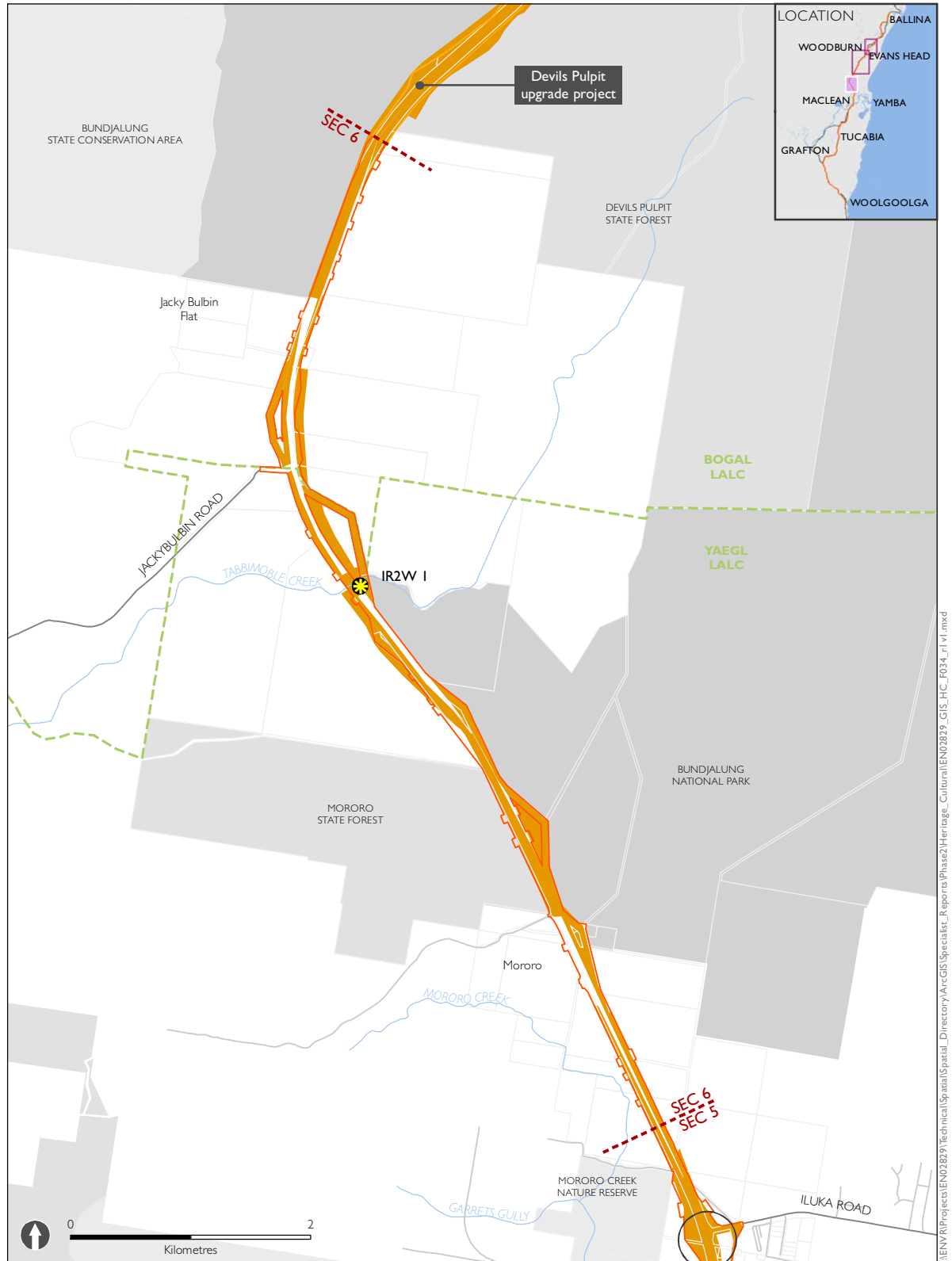
As a result of the several phases of survey, four new Aboriginal archaeological sites and three new areas of PAD were identified within the boundary of the project between Iluka Road and Woodburn of the boundary of the project (Table 3-3). The sites comprise four artefact scatters (three of which were isolated artefacts). Of the sites, only two have a PAD component due to the disturbed nature of the other areas. Further detail on the extents of PADs is shown in Appendix I.

Table 3-3 summarises all identified archaeological sites and PADs within the boundary of the project.

# PUBLIC

## Upgrading the Pacific Highway - Woolgoolga to Ballina Upgrade

Figure 3-1 Section 6 - Iluka Road to Devils Pulpit upgrade - Survey coverage



- The project
- Sites near or within the project corridor
- Upgrade under construction
- Survey coverage
- Existing Pacific Highway



# PUBLIC

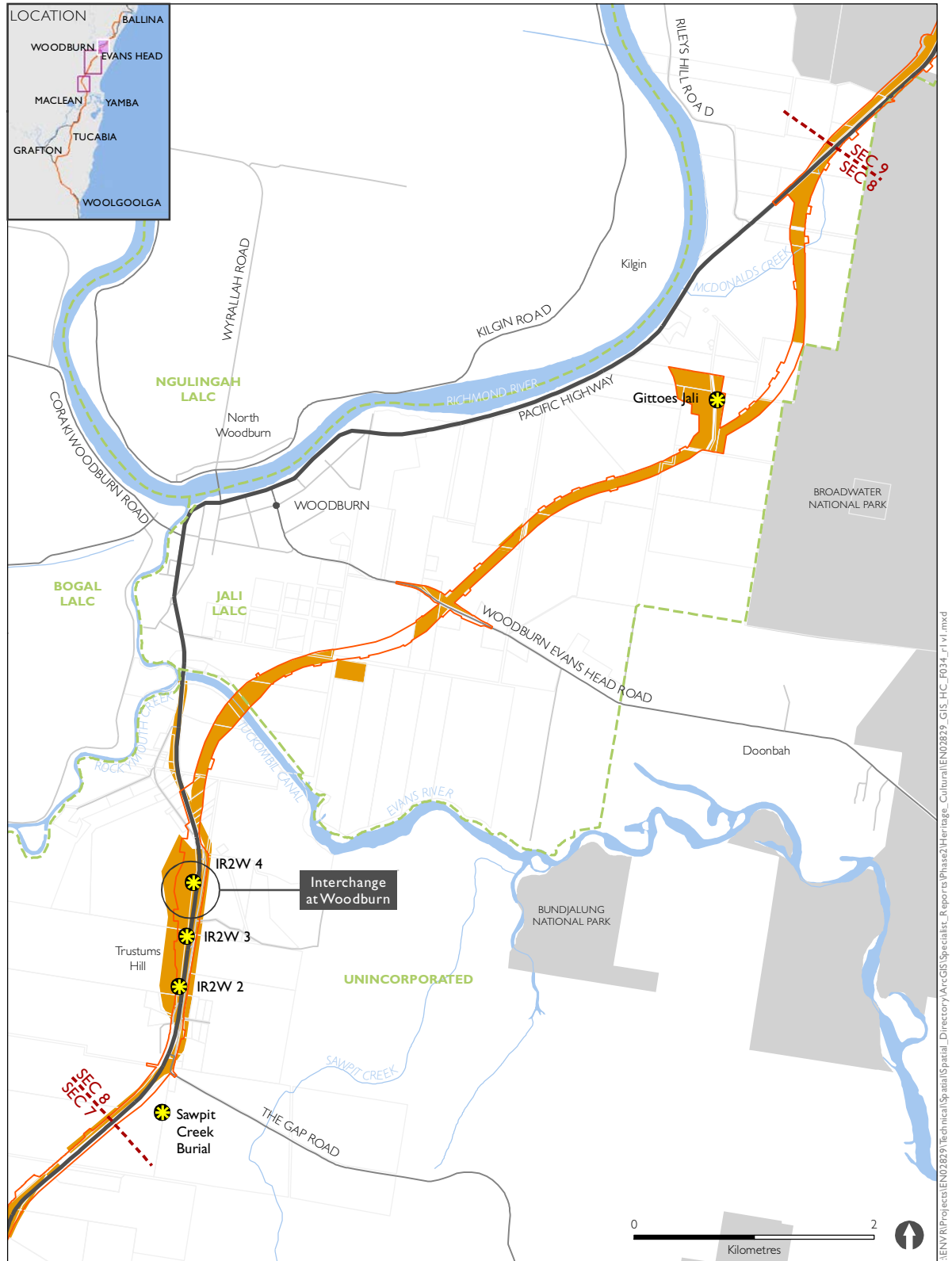
Upgrading the Pacific Highway – Woolgoolga to Ballina Upgrade

This page has been deliberately left blank to preserve confidential information.

# PUBLIC

Upgrading the Pacific Highway - Woolgoolga to Ballina Upgrade

Figure 3-3 Section 8 - Trustums Hill to Broadwater National Park - Survey coverage



- The project
- Upgrade under construction
- Existing Pacific Highway
- ★ Sites near or within the project corridor
- Survey coverage

**Table 3-3 All identified archaeological sites and PADs near or within the boundary of the project between Iluka Road and Woodburn**

Project section	AHIMS ID	Name	Site type(s)	Description	Landscape unit	Potential archaeological sensitivity (L, M, H)	Method of identification
7	13-1-0114	IR2W1	Site - Isolated artefact	On a compact clay exposure on the creek flat south of Tabbimoble Creek. No further artefacts could be detected and in view of its disturbance context it is concluded that the site location has little further archaeological potential.	Tabbimoble Rises – low hills	Low-Moderate	Pre-2010 PHU survey
7	13-1-0186	Bolger PAD	PAD	Low, flat sandy rise adjacent swamp.	Tabbimoble Rises – low hills and lowland	Low-Moderate	2010 survey
8	13-4-0112	IR2W2	Site - Artefact scatter and PAD	Nine visible stone artefacts of a range of materials located on a 120 m long and two metre wide section of track that extends across the northern upper slope and crest of an undulating a ridgeline.	Tabbimoble Rises – low hills	Moderate	Pre-2010 PHU survey
8	13-1-0113	IR2W3	Site - Isolated artefact	Greywacke flake on the level crest of an undulating ridge. Significant disturbance in and around site.	Tabbimoble Rises – low hills	Low-Moderate	Pre-2010 PHU survey
8	13-1-0115	IR2W4	Site - Isolated artefact and PAD	Pebble tool located on the northern upper slopes of a ridge.	Tabbimoble Rises – low hills	Moderate	Pre-2010 PHU survey

## 4. Sub-surface testing

### 4.1. Introduction

As three areas of PAD have been identified, according to PACHCI, and the of the DP&I Director-General's requirements, sub-surface testing should be undertaken in these areas to better determine the impact to Aboriginal cultural heritage values within the boundary of the project.

### 4.2. Aims

The aims for the sub-surface testing, within the boundary of the project between Iluka Road and Woodburn were to explore the sub-surface nature of the three PADs (either sites with PAD components or standalone PADs) identified during survey (Table 4-1). Specifically to:

- Determine the presence of sub-surface deposits for all PADs.
- Determine the nature, depth, extent and significance of archaeological deposits within the boundary of the project.
- Consult with registered Aboriginal stakeholders in regards to this work and the sites being tested.
- Develop recommendations to minimise or mitigate potential impacts.
- Consult with Aboriginal stakeholders in regards to these recommendations.
- Excavate consistently with the geomorphology of the relevant landform.
- To comply with the Department of Planning and Infrastructure's Director-General requirements.
- Undertake excavation with regard to the Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales 2010 and in accordance with the DP&I Director-General requirements.
- Undertake a small amount of 'control' excavations outside PADs to test the accuracy of the predictive model.

**Table 4-1 PADs and sites within the boundary of the project between Iluka Road and Woodburn, noting requirement for sub-surface testing**

Project section	Name / AHIMS ID	Site type(s)	Description	Sub-surface testing required
7	IR2W1 13-1-0114	Site – Isolated artefact	On a compact clay exposure on the creek flat south of Tabbimoble Creek. No further artefacts could be detected and in view of its disturbance context it is concluded that the site location has little further archaeological potential.	No

# PUBLIC

Woolgoolga to Ballina Pacific Highway Upgrade  
Aboriginal Heritage Assessment – Iluka Road to Woodburn  
Volume 2: Appendices

Project section	Name / AHIMS ID	Site type(s)	Description	Sub-surface testing required
7	Bolger PAD 13-1-0186	PAD	Low, flat sandy rise adjacent swamp.	Yes
8	IR2W2 13-4-0112	Site – Artefact scatter and PAD	Nine visible stone artefacts of a range of materials located on a 120 m long and two metre wide section of track that extends across the northern upper slope and crest of an undulating a ridgeline.	Yes
8	IR2W3 13-1-0113	Site – Isolated artefact	Greywacke flake on the level crest of an undulating ridge. Significant disturbance in and around site.	No
8	IR2W4 13-1-0115	Site – Isolated artefact and PAD	Pebble tool located on the northern upper slopes of a ridge.	Yes

## 4.3. Timing and personnel

Sub-surface testing for the project between Iluka Road and Woodburn was undertaken between 12 December and 23 December 2011. Table 4-2 outlines the personnel involved in sub-surface testing.

**Table 4-2 Timing and personnel involved in sub-surface testing**

Week number	SKM supervisors	SKM personnel	Archaeology sub-consultants	Aboriginal stakeholders
12 December – 18 December 2011	Joseph Brooke	Rebecca Andrews Amanda Goldfarb	Shoshanna Grounds Jonathan Minter Tristan Minter Annabelle Minter	<p><b>Jali LALC</b> Marcus Ferguson</p> <p><b>Burabi Aboriginal Corporation</b> Anthony Cook Dwayne Cook</p> <p><b>Yaegl LALC and Native Title Claim</b> Gilbert Laurie</p> <p><b>Bandjalang Native Title Group</b> Doug Wilson Daniel Wilson</p> <p><b>Bogal LALC</b> Daryl Knight Grant Wilson</p>

Week number	SKM supervisors	SKM personnel	Archaeology sub-consultants	Aboriginal stakeholders
19 December – 23 December 2011	Vanessa Edmonds Robyn Jenkins	Jared Brindley Amanda Goldfarb	Jonathan Minter Shoshanna Grounds Tristan Minter Morgan Wilcox	<b>Jali LALC</b> Marcus Ferguson Dean Bolt

## 4.4. Methodology

Sub-surface test excavations took place only at PADs identified within the boundary of the project. The methodology was initially restricted to following the Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales 2010 until the DP&I Director-General's requirements were issued on 23 November 2011. This restriction included:

- Excavating only within the boundary of the project.
- Excavating a series of 0.5 metres x 0.5 metres shovel test pits (STPs) by hand tools and in a controlled manner.
- Excavating below archaeological deposits and into sterile soils.
- Excavating no more than 0.5 per cent of the test area (site with PAD, PAD, or control area), unless the site is less than 50 metres squared.
- All analysis of Aboriginal objects that were uncovered during test excavation were analysed in the field.

The methodology used to test the PADs for sub-surface Aboriginal objects involved the hand excavation of 0.5 metres x 0.5 metres test pits, removing soils in excavation units of 50 millimetres. The following hand tools were used: trowel, spade, shovel and where necessary (eg heavy compact clay or gravels), mattock. In test pits where potential *in situ* Aboriginal cultural heritage material was encountered (eg in well-cemented alluvial deposits), hand tools such as trowels and straight-edged spades were used. These 0.5 metres x 0.5 metres test pits were employed to investigate the sub-surface character of soil deposits and to define the extent of sites. Test pits were aligned in either transects (spaced evenly along a line) or placed on a grid pattern, to systematically sample the PADs. Test pits were spaced at 10 metres and 20 metres intervals, depending on the observed disturbance of the area, and the predicted sensitivity of the landforms on which the PAD was located. Transects were used to sample thinner areas, whereas grids were used to sample wider areas.

Three control areas not located in site/PAD boundaries were sampled to test the predictions in the predictive model; the same methods and sample approach was used in control areas. Control areas were located in areas the predictive model identified to be not likely to be sensitive for archaeological material, such as flat, flood-prone areas, or steep gradient slopes

Soil deposits were sieved using three millimetres and five millimetres gauge mesh sieves. Dependent on property access a mechanical sieve (five millimetres mesh) was also used in conjunction with hand sieves. The location of the excavation sub-surface test pits were recorded using a mobile GIS Unit (Trimble® GeoXH™ GeoExplorer® or the Trimble® Nomad). This allowed

for the spatial datasets collected in the field to be post-processed to sub-metres level accuracy once the GPS co-ordinates have been differentially corrected.

All Aboriginal objects, features and other non-cultural inclusions were recorded according to their excavation unit. Records were kept of the objects provenance and cultural material of excavated soil in relation to the estimated volume of soil removed. Changes in the deposit, stratigraphy and any unusual features were recorded by the use of context sheets related to photographic records. Stratigraphic profiles of representative test pits were drawn for all PADs/sites. Descriptions of sediment colours were assessed through reference to a Munsell soil colour chart and pH values were determined through a colorimetric test. Sub-surface test excavation only ceased when enough information had been recovered to adequately characterise the objects present with regard to their nature and significance.

The analysis of all Aboriginal objects was undertaken in the field. All artefacts retrieved during sub-surface testing were double bagged and labelled with appropriate contextual information. Analysis was then undertaken which included all measurements, identification of material, depth and test pit locations and photos. Following detailed analysis in the field, all artefacts were left *in situ*, or reburied in the one location on the site to make relocation easier.

All excavations were backfilled with the original soil on completion of excavation and recording. Where possible, ground cover was retained for reinstatement of the test pits following backfilling. Any residual soil was scattered within the vicinity of the site at a low density.

#### 4.4.1. Constraints

The primary constraints included wet weather, which caused the cancellation of some fieldwork days and property access.

## 4.5. Results

A total of three PADs were excavated within the Iluka to Woodburn section (Table 4-3). Of these three PADs two contained sub-surface Aboriginal deposits. No control test pits contained Aboriginal archaeological material (Table 4-4). The excavation included 70 shovel test pits (0.5 metres x 0.5 metres).

A summary of all sites and the location of all excavations can be found in Appendices M, N and O.

**Table 4-3 Summary of all excavations and Aboriginal objects recovered during sub-surface test excavation**

Site name (AHIMS ID)	GPS co-ordinates Easting/Northing (MGA Zone 56)	Potential archaeological sensitivity	Landscape unit	Number of investigations (Shovel Test Pits)	Aboriginal objects
Bolger PAD (13-1-0186)	530679 E / 6776102 N	Low-moderate	Tabbimoble Rises – low sandy rise	20 (0.5 m x 0.5 m)	None

Site name (AHIMS ID)	GPS co-ordinates Easting/Northing (MGA Zone 56)	Potential archaeological sensitivity	Landscape unit	Number of investigations (Shovel Test Pits)	Aboriginal objects
IR2W2 PAD (13-1-0112)	533027 E / 6780070 N	Low-moderate	Tabbimoble Rises – slight sandy rise	20 (0.5 m x 0.5 m)	3 artefacts (silcrete, chalcedony)
IR2W4 PAD (13-1-0115)	533060 E / 6780837 N	Moderate	Tabbimoble Rises – crest of rise	20 (0.5 m x 0.5 m)	11 artefacts (chalcedony, fine grained siliceous, silcrete)

**Table 4-4 Summary of sub-surface testing of control areas**

Potential archaeological sensitivity	Landscape units	Number of investigations	Aboriginal objects
Low	Tabbimoble Rises – low hills	5 (0.5 m x 0.5 m)	None
Low	Tabbimoble Rises – lowland	5 (0.5 m x 0.5 m)	None

Prior to the sub-surface test excavation a total of four archaeological sites – IR2W1, IR2W2, IR2W3 and IR2W4 – and one PAD – Bolger PAD – had been identified. The sub-surface testing resulted in:

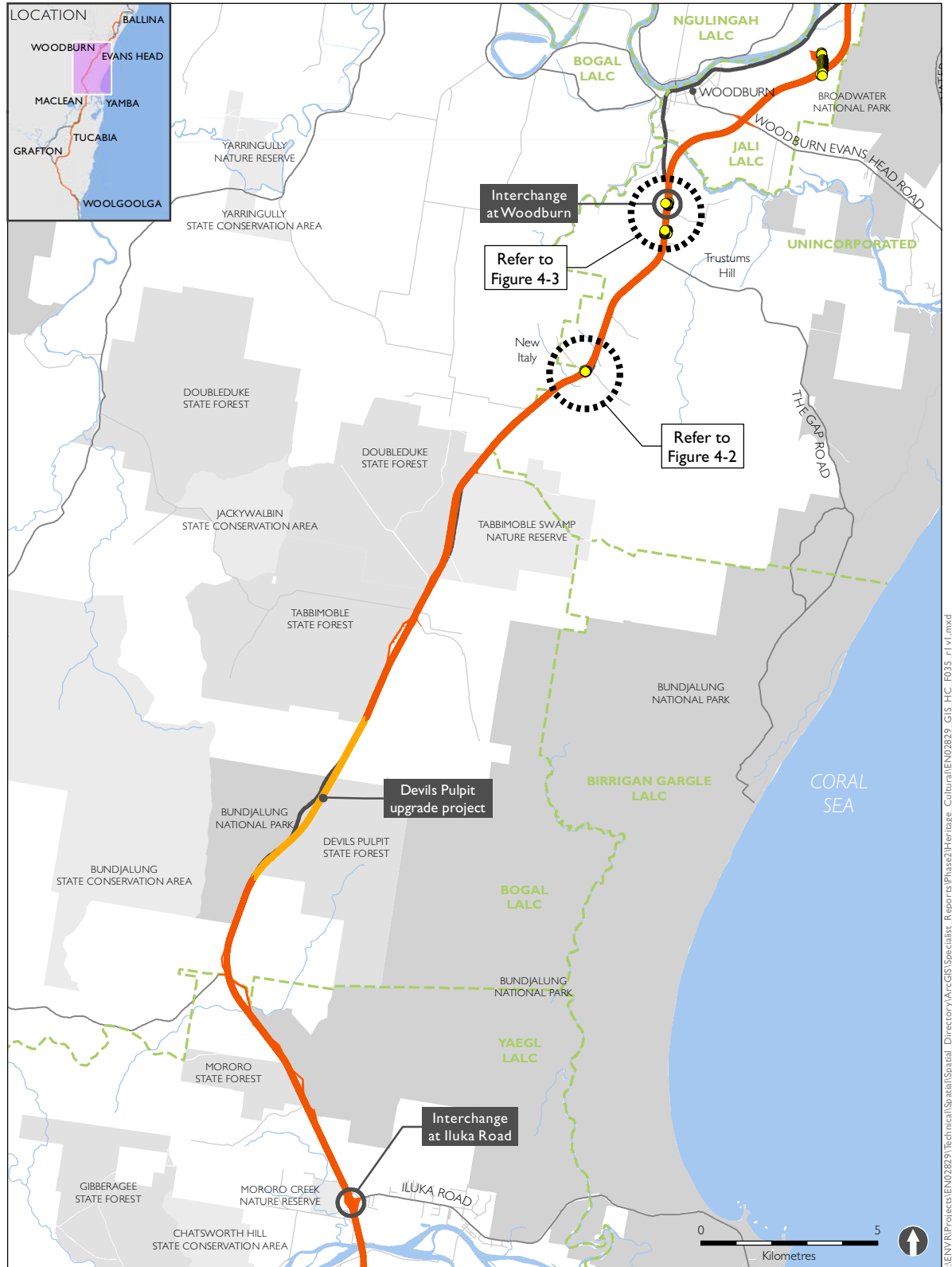
- Two of the sites, IR2W2 and IR2W4, containing sub-surface material in addition to the previously recorded surface material at these sites (Table 4-3).
- Bolger PAD being found to not be a site.
- Control areas sampled contained no Aboriginal archaeological material (Table 4-4).

Stratigraphic drawings were undertaken at all PADs to ensure that any changes in soil profile were accurately recorded. These can be found in Appendix L.



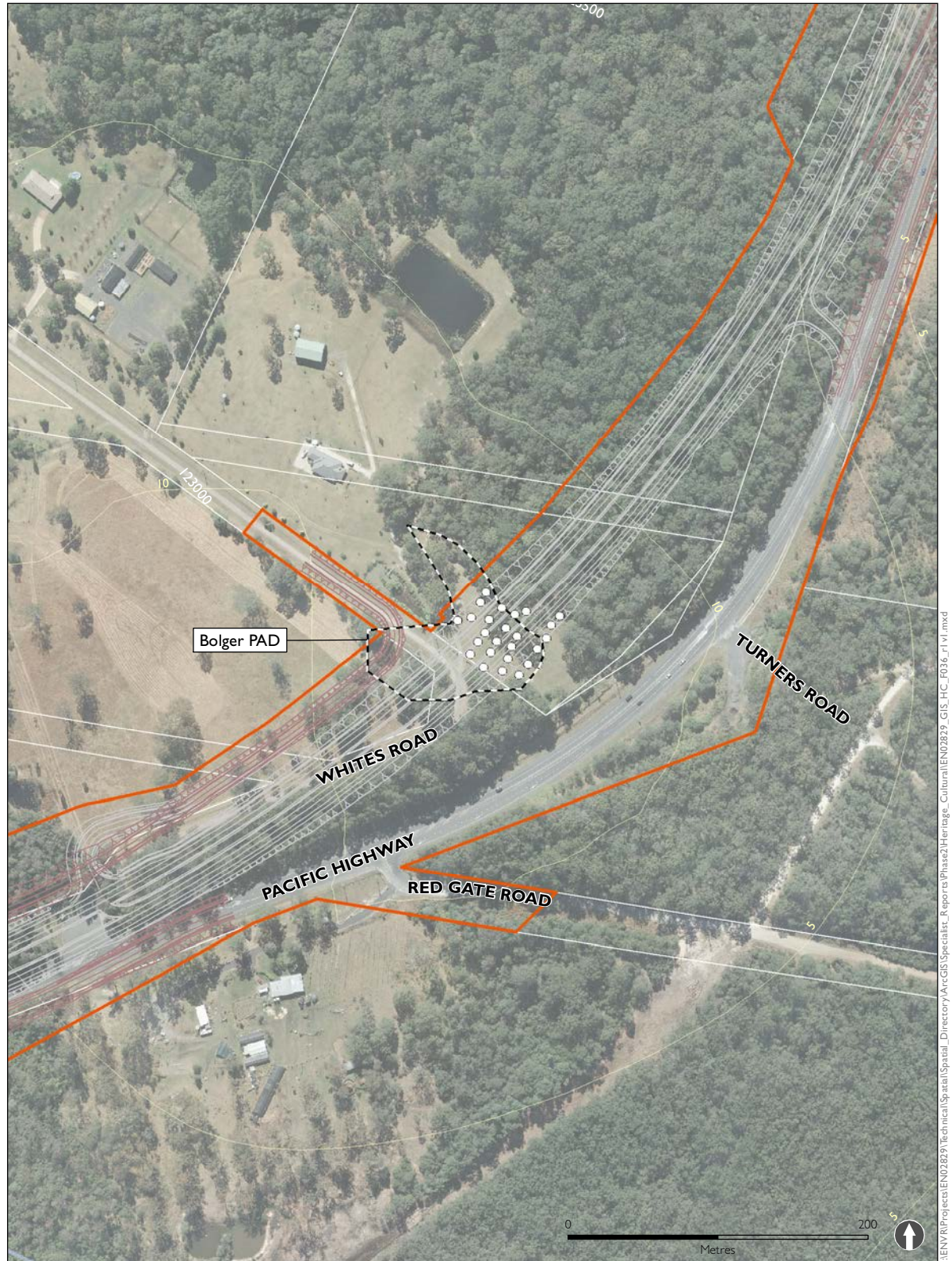
## Upgrading the Pacific Highway - Woolgoolga to Ballina Upgrade

Figure 4-1 Iluka Road to Woodburn - Sub-surface testing



## Upgrading the Pacific Highway - Woolgoolga to Ballina Upgrade

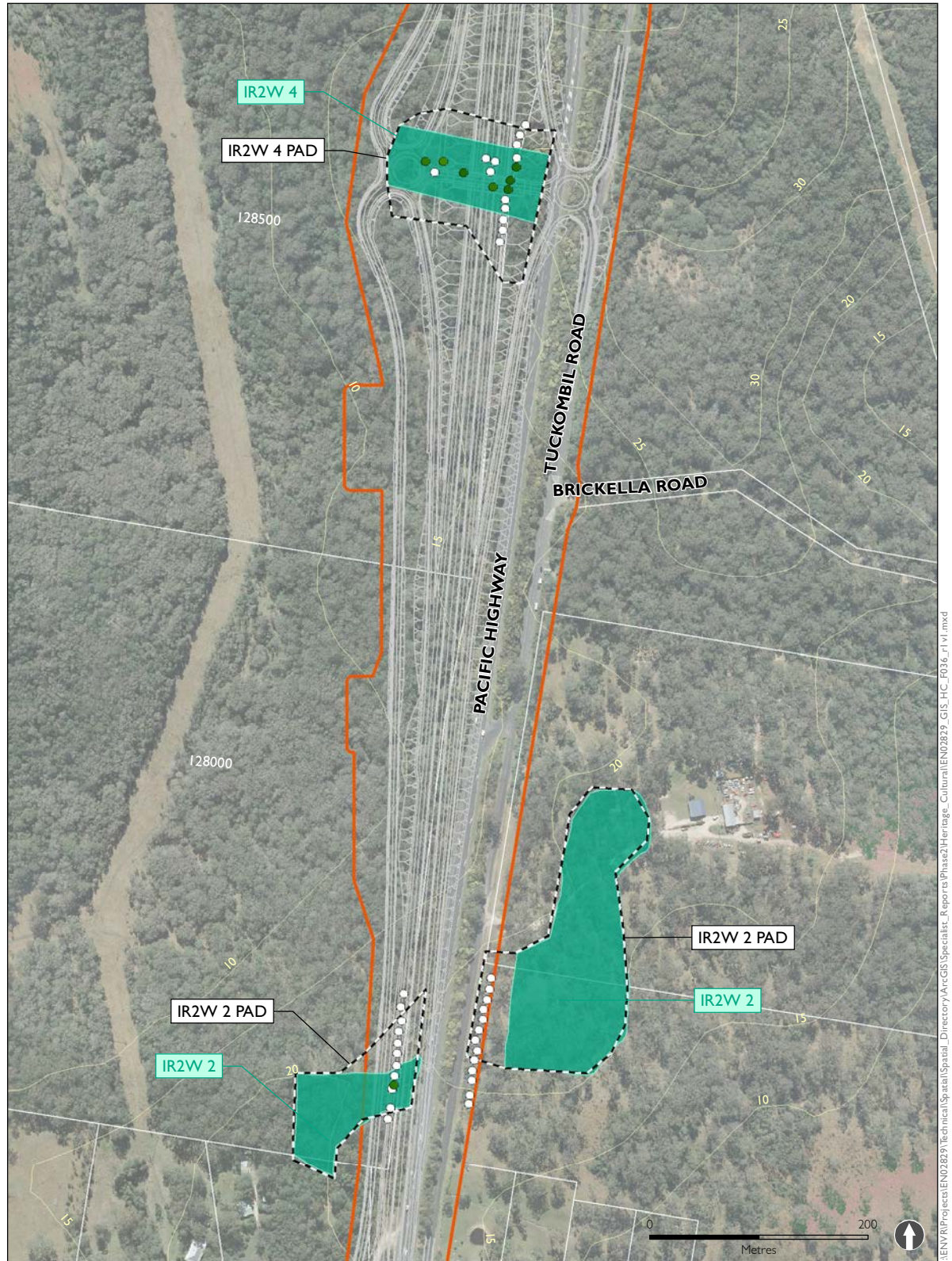
Figure 4-2 Sub-surface testing 1



- |                    |                           |                               |                     |
|--------------------|---------------------------|-------------------------------|---------------------|
| The project        | Aboriginal heritage areas | Sub-surface testing locations |                     |
| Road design detail | Scarred tree              | Reburial point                | Number of artefacts |
|                    | Site area                 | Shovel probe                  | low high            |
|                    | Initial PAD area          | Test pit                      |                     |
|                    |                           | Mechanical trench             |                     |

## Upgrading the Pacific Highway - Woolgoolga to Ballina Upgrade

Figure 4-3 Sub-surface testing 2



- |                    |                           |                               |                     |
|--------------------|---------------------------|-------------------------------|---------------------|
| The project        | Aboriginal heritage areas | Sub-surface testing locations |                     |
| Road design detail | Scarred tree              | Reburial point                | Number of artefacts |
|                    | Site area                 | Shovel probe                  |                     |
|                    | Initial PAD area          | Test pit                      | low high            |
|                    |                           | Mechanical trench             |                     |

## 5. Archaeological sites

### 5.1. Summary of archaeological sites

Following survey and sub-surface testing, sites/PADs were determined either:

1. To be sites
2. To not be sites.
3. Determined to not be sites within the boundary of the project, but still sites/PADs outside the boundary of the project.

Table 5-1 outlines the revised status and the new names for all the areas that were subject to investigation.

**Table 5-1 Status of PADs and sites near or within the boundary of the project between Iluka Road and Woodburn following survey and sub-surface testing**

Project section	Name (AHIMS ID)	Type(s)	Description	Investigation	New name	New site type(s)	Near or within project
7	IR2W1 (13-1-0114)	Site – Isolated artefact	On a compact clay exposure on the creek flat south of Tabbimoble Creek. No further artefacts could be detected and in view of its disturbance context it is concluded that the site location has little further archaeological potential.	Survey	IR2W1	Site – Isolated artefact	Within
7	Bolger PAD (13-1-0186)	PAD	Low, flat sandy rise adjacent swamp.	Test-excavation and survey	Bolger PAD	Not a site	N/A
8	IR2W2 PAD (13-1-0112)	Site – Artefact scatter and PAD	Nine visible stone artefacts of a range of materials located on a 120 m long and two metre wide section of track that extends across the northern upper slope and crest of an undulating a ridgeline	Test-excavation and survey	IR2W2	Site – Artefact scatter	Within

Project section	Name (AHIMS ID)	Type(s)	Description	Investigation	New name	New site type(s)	Near or within project
8	IR2W3 (13-1-0113)	Site – Isolated artefact	Greywacke flake on the level crest of an undulating ridge. Significant disturbance in and around site.	Survey	IR2W3	Site – Isolated artefact	Within
8	IR2W4 PAD (13-1-0115)	Site – Isolated artefact and PAD	Pebble tool located on the northern upper slopes of a ridge	Test-excavation and survey	IR2W4	Site – Artefact scatter	Within

## 5.2. Archaeological analysis

### 5.2.1. Introduction

Archaeological sites are often said to be records of ‘stone and bone’, two of the most durable products of human activity. Stone artefacts being inorganic do not deteriorate rapidly in a human time scale and are ubiquitous reminders of human activity in the past. Understanding stone use in the past allows interpretations of human behaviour to be made. Interpretation of human behaviour from stone material is derived from fracture mechanics studies, or why different materials fracture in different ways when struck by objects.

Based on the recording undertaken of the stone artefacts in the field, analysis of the data collected from each individual archaeological site was undertaken in order to present a site specific interpretation of the stone artefacts at each locality. A more detailed stone artefact analysis undertaken under laboratory conditions would examine patterns of raw material use and movement between sites within the region; however, due to the preliminary nature of this analysis, this has not been undertaken at this stage. The occurrence and distribution of stone raw materials are discussed to attempt to gain insights into the way people were using each of the archaeological sites.

The sites that yielded a large sample (ie large numbers of artefacts) are given more detailed analysis below. It is not possible to undertake detailed analysis of those sites with small sample sizes (few artefacts), as inferences made on these samples are not robust, consequently analysis of these sites is summary in nature.

Appendix M contains photos of a selection of Aboriginal objects from each site.

### 5.2.2. Methodology

Each stone artefact was classified according to its raw material type and technological type category and entered into a database. In classifying each artefact into a technological category careful examination of the artefact was undertaken. Initial examination of the artefact involved deciding the location of the ventral and dorsal sides. Negative flake scars or cortex was indicative of dorsal attributes. Bulbs of percussion, impact points, fissures and ripples indicate ventral

attributes. These indicators as well as others such as a platform and termination point are the deciding factors as to which technological category each piece was assigned.

The maximum dimension measurement was taken on all stone artefacts. Measurements of length, width and thickness were taken on complete stone artefacts (flakes) only. Platform measurements and termination descriptions were taken on stone artefacts, where these attributes were present. Cortex or the amount of natural stone still left on the dorsal side of the flake was also recorded for all artefacts. The amount of cortex present on a flake has been used to indicate the reduction stage in which a flaked piece was removed from a core (the parent material). This is due to the exclusive presence of cortex on the exterior surface of the lithic raw material, and the fact that the exterior will be the first area removed during core reduction.

A glossary of the terms used in the stone analysis is provided in Appendix B.

### 5.2.3. Constraints

The analysis and interpretation of archaeological sites presented below has been preliminary in nature and subject to time constraints and the necessity of undertaking stone artefact analysis in the field rather than in a laboratory. Further archaeological assessment into the source of raw materials and the nature of stone artefact maintenance and manufacture will need to be undertaken at the salvage stage of the project. Additionally, stone artefacts recorded during investigations prior to 2010 are not included in this analysis, as attributes recorded differ from those here.

### 5.2.4. Key sites

This Chapter discusses interpretations of findings at all archaeological sites located within the boundary of the project. Linear corridor projects like this offer, a cross section sample of numerous landforms within a region, allowing some degree of comparative analysis between landforms. Consequently, this section briefly examines the relationship between the occurrence of archaeological and cultural sites, and the landscape in the boundary of the project. The occurrence and distribution of stone raw materials are discussed to attempt to gain insights into the way people were occupying and moving across the landscape, and exploiting resources.

Appendix M contains photos of a selection of Aboriginal objects from each site.

#### 5.2.4.1. IR2W4

IR2W4 broadly falls within the Tabbimoble Rises low hills and undulating rises landscape unit. The area is south of the Richmond River and within the Richmond River Ranges. This site is unlikely to have been larger in extent or variability despite disturbance due to road construction, logging and other pastoral activities. IR2W4 is a single component (artefact scatter) site, with 11 stone artefacts discovered during sub-surface testing.

The following summary analysis is based upon a small artefact sample size (n=11). Consequently, only broad inferences are made here. The known contents of this site include 11 flaked artefacts, predominantly of silcrete (81.8 per cent) (Figure 5-1). Just over half of the artefacts have no signs of cortex, however, two cores were present (both with cortex). Flakes make up the majority of the technological types (54.5 per cent) found at the site, with angular fragments (27.3 per cent) and cores following (7.7 per cent) (Figure 5-2). Retouch was present on four artefacts (36 per cent), a relatively high proportion, though this could be a result of the small sample size.

# PUBLIC

Woolgoolga to Ballina Pacific Highway Upgrade  
Aboriginal Heritage Assessment – Iluka Road to Woodburn  
Volume 2: Appendices

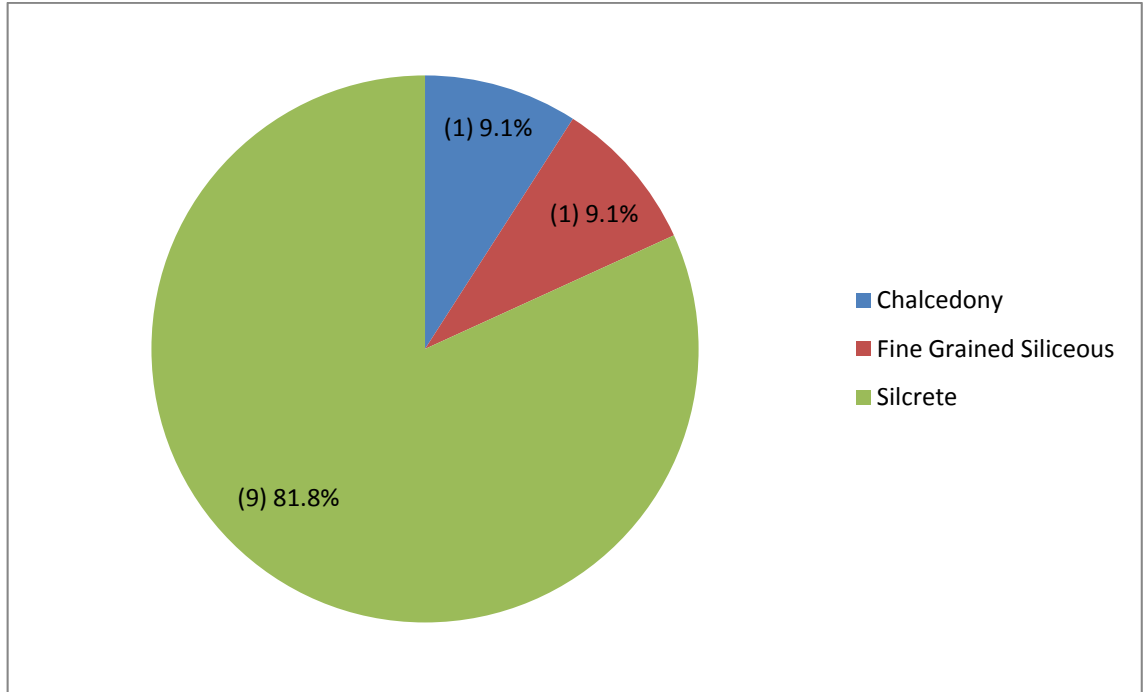


Figure 5-1 Proportion of raw material types at IR2W4 artefact scatter; n=11

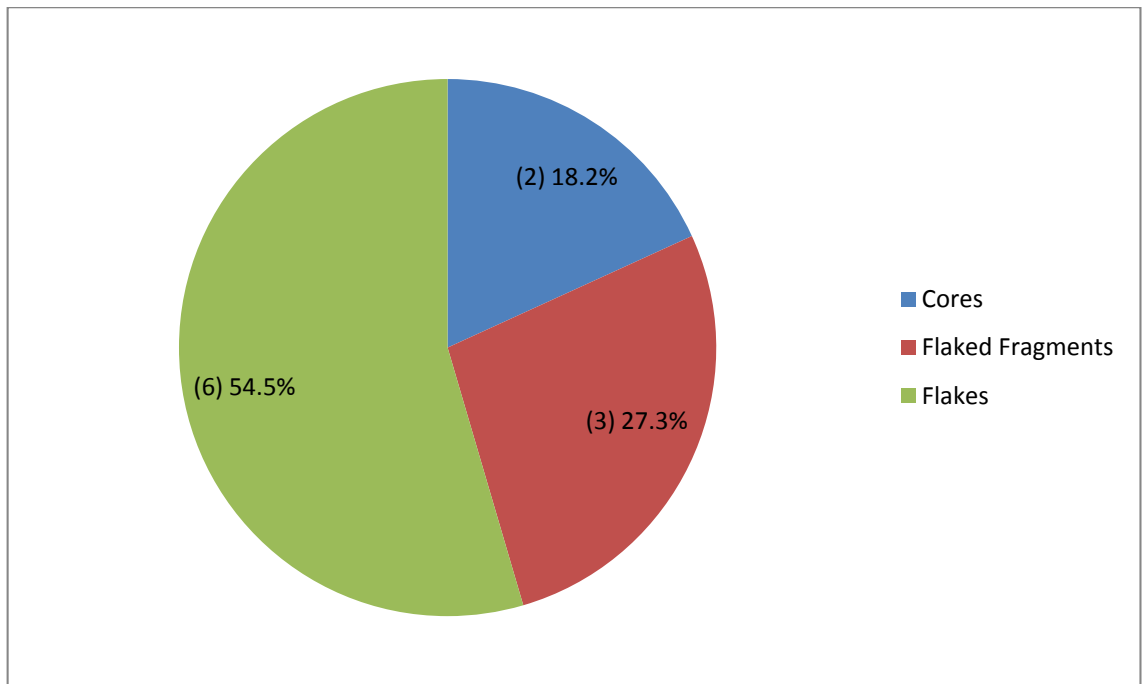


Figure 5-2 Proportion of artefacts in each technological type; n=11

## 5.2.4.2. IR2W2

IR2W2 is the only other site recorded with a sub-surface component within the Iluka to Woodburn section. Only three artefacts were recovered during sub-surface testing. A summary of the contents of this site is available in Table 5-2 and in Appendix N.

IR2W2 was located within the Tabbimoble Rises low hills and undulating rises landscape unit, and includes chalcedony and silcrete raw materials.

**Table 5-2 Table of sites with less than ten artefacts recovered**

Site name	No. of artefacts	Material	Depth range (mm)	Unique items
IR2W2	3	Chalcedony and silcrete	0- 150	N/A

## 5.2.5. Landforms and predictive model

Generally, the predictive model (see Table 2-2) is supported with regard to the observed distribution of sites in the landscape. As predicted, greater numbers of archaeological sites occurred in areas which were assessed as having higher archaeological sensitivity within the boundary of the project. This is somewhat biased by the fact that most of the project falls within the Tabbimoble Rises landsystem; however, within this landsystem, landscape characteristics predicted to be sensitive were the only locations where sites were found. Very little variety in the type of sites was observed within the Iluka to Woodburn section of the project with all sites being either isolated artefacts or small artefact scatters. This confirms that this is not a particularly sensitive landscape for Aboriginal archaeological sites.

Archaeological sites recorded during the field work to date have been found predominantly on the upper slopes and crests of undulating rises and generally close to water sources. These landforms would have provided relatively flat areas suitable for camping close to resources, elevated above the flood zone and in the case of undulating rises with views of the surrounding landscape.

**Table 5-3 Archaeological sites located within the broad archaeological landscape units**

Broad archaeological landscape units	Specific landscape characteristics	Project section	Sensitivity rating	Number of sites (% of total sites)	Sites
Clarence River Valley	Clarence River floodplain consisting of an undulating plain of low rises, levees, terraces and depressed flood channels.	6	L-M	0	N/A
Tabbimoble Rises	Low hills and undulating rises up to 40 m above sea level.	6, 7, 8	M	4 (100)	IR2W1 IR2W2 IR2W3 IR2W4



Broad archaeological landscape units	Specific landscape characteristics	Project section	Sensitivity rating	Number of sites (% of total sites)	Sites
	Lowland areas with elevations of less than 10 m above sea level consisting of alluvial floodplains, back swamps and drainage channels.	6	M	0	N/A
Richmond Alluvial Plain	Alluvial plain of low lying flat terrain, approximately 5 metres above sea level. Area has been drained, cleared and extensively cultivated.	8	L-M	0	N/A

### 5.2.6. Summary

The nature of the archaeological sites recorded within the boundary of the project between Iluka Road and Woodburn allows little insight into pre-contact and post-contact occupation of the area, due to the small number of sites, small number of artefacts recovered, and the limitations this posed during the artefact analysis. The archaeological sites recorded within the boundary of the project represent the movement of Aboriginal people around the landscape. The location and nature of the sites indicates that Aboriginal People were utilising the low hills and undulating rises in an ephemeral way, most likely while moving between the coast and the hinterland.

The distribution of the archaeological sites recorded in the boundary of the project reinforces the pattern suggested in the predictive model. Elevated areas, such as rises and sand dunes adjacent to swamps, creeks, and rivers show the largest proportion of archaeological sites. These areas would have provided areas of good vantage and with good ventilation in warmer months. They would have provided access to water sources and associated resource-rich zones around them. During wetter months, these areas would have provided well-drained, drier areas above the lower-lying waterlogged, flooded, or flood prone areas.

### 5.2.7. Conclusion

This archaeological assessment has added substantial data to the archaeological record of this region. It has introduced important information for informing the detailed design and impact assessment for the Pacific Highway Woolgoolga to Ballina upgrade project between Iluka Road to Woodburn. The study has also enhanced the record in an area where archaeological data was limited. The extensive sub-surface testing undertaken for this assessment, has made a particularly important contribution to our understanding of the archaeology of Aboriginal occupation of this region – a region that was otherwise characterised by little information of the important, and otherwise hidden sub-surface component.

## 6. Significance assessment

A complete significance assessment of all identified Aboriginal cultural heritage values near and within the boundary of the project is presented in the CHAR, with only the archaeological sites assessed here.

### 6.1. Methodology

#### 6.1.1. Basis for assessment

A significance assessment is made up of several significance criteria that attempt to define why a site is important. Evidently, this can be challenging as sites are important for different reasons to different people, and even at different times. The assessment of Aboriginal cultural heritage in this assessment is based upon the four values of the *Australia ICOMOS Burra Charter* (Australian ICOMOS 1999).

- Social values.
- Historical values.
- Scientific values.
- Aesthetic values.

Each of these values is assessed below, and an overall significance is then given based on an average across the values. This is inherently a reductive process, and oversimplifies what is important to a range of different stakeholders, but is a necessary process in being able to create comparative values between sites. The significance of each site ultimately feeds the management of sites and places (see Chapter 9).

#### 6.1.2. Social significance

The significance of a site does not relate only to its scientific or research value. Aboriginal people's views on the significance of archaeological sites are usually related to traditional, cultural and educational values, although some Aboriginal people also value any scientific information a site may be able to provide.

Aboriginal cultural significance was assessed from consultation with the nominated Aboriginal sites officers and other members of the stakeholders, including Elders, both during and following field assessments. It should be noted that Aboriginal significance assessed in this manner may not reflect the views of all members of the community.

#### 6.1.3. Scientific significance

Aboriginal site significance assessments need to consider both the scientific and social or cultural values of a site. Research potential or scientific significance of an Aboriginal archaeological site can be assessed by utilising the criteria set out below. Social or cultural values of a site can only be established through Aboriginal consultation.

Criteria used for assessing scientific significance for Aboriginal archaeological sites are described below. Ratings are low, moderate or high.

- **Site integrity** – The integrity of a site refers to its state of preservation, or condition. A site can be disturbed through a number of factors among which are: natural erosion processes, destructive land use practices or repeated use of a site in the past by both humans and animals.
- **Site structure** – Structure refers to a site’s physical dimensions, that is, size and stratification, or sub-surface deposits. A large site or a site with stratified deposits has more research potential than small sites and/or surface scatters. Sometimes however, specific research questions may be aimed at smaller sites in which case they would be rated at a higher significance than normal. Site structure cannot be assessed for scarred trees or isolated artefacts.
- **Site contents** – This category refers to the range and type of occupation debris found in a site. Generally, complex art sites, extensive quarries with associated debris and surface sites that contain a large and varied amount of organic and non organic materials are considered to have greater research potential than those sites with small, uniform artefacts, single motif art sites and small quarries with little or no debris. With scarred trees contents may refer to the size and type of scar or how many there are on the one tree.
- **Representativeness and rarity** – Representativeness refers to how much variability exists between the subject site and others inside or outside the subject area. It also considers the types of sites already conserved in the area and how much connectivity between sites exists. Rarity considers how often a particular site type occurs in an area. Assessment of representativeness and rarity requires some knowledge of the background archaeology of the area or region in which a study is being undertaken. Rarity also relates to whether the subject site or area is important in demonstrating a distinctive way of life, custom, process, land use, function or design which is no longer practiced (OEH 2011:10).

#### 6.1.4. Aesthetic significance

This refers to the ‘sensory’ value of a place, and can include aspects such as form, texture, and colour, and can also include the smell and sound elements associated with use or experience of a site (Australian ICOMOS 1999). Aesthetic significance can be closely linked to the social value of a site.

#### 6.1.5. Historic significance

The historic value of a site is determined through its association with historically important people, events or activities.

#### 6.1.6. Scale of significance

Significance of sites and places is assigned to different geographic scales, such as local, regional, State and National, appropriate to the scale of importance. For example, Uluru is significant at a National (and World) scale, whereas a local historic building may only be significant on a local scale. This is reflected in the variety of heritage lists held by local councils, up to State and Federal government. In scale of significance, the criteria presented above as well as educational or

research potential, representativeness and rarity (Australian ICOMOS 1999) have been considered in determinations of significance.

Each site has been assessed and its scale of significance has been identified as being of importance at the State, regional or local level. Each site has also been given a grading of its significance overall based on the grading of each of the individual values. The gradings of low, moderate and high have been assigned comparatively across the sites investigated in the region.

## 6.2. Statements of significance

### 6.2.1. IR2W1 (AHIMS ID 13-1-0114)

#### **Social significance**

- Site IR2W1 comprises an isolated artefact and has low social significance as it provides evidence of the use of the area by Aboriginal people in a very limited way.

#### **Historical significance**

- The site does not meet this criterion.

#### **Scientific significance**

- The site has low scientific significance as it is ranked as having low integrity, no structure, low contents and low representativeness/rarity.
- The integrity of the site is low as it has been heavily disturbed by post-contact land-use practices. The site has no structure as it comprises a single isolated artefact. The site has a low contents ranking as the site comprises of a single artefact and the raw material is common to the area. The site has a low representativeness ranking as artefact scatters are common within the region. The site has no research or educational potential.

#### **Aesthetic significance**

- The site does not meet this criterion.

#### **Summary statement of significance**

- Overall IR2W1 is of low significance at the local level. It is of low social significance as it provides evidence of the use of the area by Aboriginal people in a very limited way. It has low scientific significance due to its comprising a single isolated artefact, made from common raw material and the overall common presence of stone artefact scatters in the region.

### 6.2.2. Scarred/engraved Tree (AHIMS ID 13-1-0111)

#### **Social significance**

- The scarred/engraved tree has high social significance as it is of sacred and ceremonial importance to the traditional owners, particularly through its association with a women's ceremonial site.

## **Historical significance**

- The tree has high historical significance as it is one of the few remaining Aboriginal 'markers' in the landscape following clearing as part of European agricultural practices.

## **Scientific significance**

- The tree has moderate-high scientific significance as it has moderate integrity, moderate-high contents and high representativeness/rarity.
- The tree has moderate integrity due to its reasonable condition. Its contents are moderate-high due to the presence of engravings on the tree. The tree has high representativeness/rarity due to the scarcity of scarred trees remaining in the region. The tree has some research potential and potential for educational purposes in passing on knowledge regarding traditions and activities that result in the scarring of trees.

## **Aesthetic significance**

- The site is of moderate-high aesthetic significance as it is a distinctive visual marker in the landscape and the distinctive engraving.

## **Summary statement of significance**

- Overall the scarred/engraved tree is of high significance at the local level and moderate significance at the regional level. It is highly socially significant due to its association with a women's ceremonial site. It has high historical significance as one of the few remaining 'markers' in the landscape representative of occupation of the region by Aboriginal people up into the historical period. It has moderate scientific significance due to its condition, rarity and the presence of engravings. The tree has some research and educational potential.

### **6.2.3. IR2W2 (AHIMS ID 13-01-0112)**

#### **Social significance**

- The site IR2W2 has moderate social significance as it provides evidence of the use of the area by Aboriginal people.

#### **Historical significance**

- The site does not meet this criterion.

#### **Scientific significance**

- The site has low scientific significance as it is ranked as having low integrity, low structure, low contents and low representativeness/rarity.
- The integrity of the site is low as it has been heavily disturbed by post-contact land-use practices. The site has no structure as it comprises a low density artefact scatter. The site has a low contents ranking as the site comprises of a low density artefact scatter and the raw

materials are common to the area. The site has a low representativeness ranking as artefact scatters are common within the region. The site has some educational value in regard to resource use and occupation of different elements of the landscape.

### **Aesthetic significance**

- The site does not meet this criterion.

### **Summary statement of significance**

- Overall IR2W2 is of low-moderate significance at the local level. It is of moderate social significance as it provides evidence of the use of the area by Aboriginal people. It has low scientific significance as it is a low density artefact scatter, with common raw materials and the overall common presence of stone artefact scatters in the region. The site has educational value regarding resource use and occupation of different elements of the landscape.

### **6.2.4. C3/2/2 (AHIMS ID 13-01-0110)**

#### **Social significance**

- The burial at site C3/2/2 is of high social significance to the traditional owners.

#### **Historical significance**

- The historical significance of the site is unknown without further research.

#### **Scientific significance**

- The site has moderate-high scientific significance through its ranking of moderate integrity, low structure, moderate-high contents, and high representativeness/rarity.
- The site had moderate integrity as it is in a reasonably undisturbed location. The site has low structure as it likely relates to a single deposition with little stratification. It has moderate-high ranking for contents based on the likely material contained in the site. It has a high representativeness/rarity rating as burials are rare on the north coast of NSW.

#### **Aesthetic significance**

- The site does not meet this criterion.

#### **Summary statement of significance**

- Overall the burial of site C3/2/2 is of moderate-high significance. It is of high social significance to the traditional owners and has moderate-high scientific significance based on its relative integrity, the materials within the site and the rarity of the site.

## 6.2.5. IR2W3 (AHIMS ID 13-1-0113)

### **Social significance**

- Site IR2W3 comprises an isolated artefact and has low-moderate social significance as it provides evidence of the use of the area by Aboriginal people in a limited way.

### **Historical significance**

- The site does not meet this criterion.

### **Scientific significance**

- The site has low scientific significance as it is ranked as having low integrity, no structure, low contents and low representativeness/rarity.
- The integrity of the site is low as it has been heavily disturbed by post-contact land-use practices. The site has no structure as it comprises a single isolated artefact. The site has a low contents ranking as the site comprises of a single artefact and the raw material is common to the area. The site has a low representativeness ranking as artefact scatters are common within the region. The site has no research or educational potential.

### **Aesthetic significance**

- The site does not meet this criterion.

### **Summary statement of significance**

- Overall IR2W3 is of low significance at the local level. It is of low social significance as it provides evidence of the use of the area by Aboriginal people in a very limited way. It has low scientific significance due to its comprising a single isolated artefact, made from common raw material and the overall common presence of stone artefact scatters in the region.

## 6.2.6. Saw Pit Creek (AHIMS ID 13-1-0059)

### **Social significance**

- The burial the Saw Pit Creek site is of high social significance to the traditional owners.

### **Historical significance**

- The site is of moderate historical significance due to historic interactions with this site.

### **Scientific significance**

- The site has moderate scientific significance through its ranking of moderate integrity, low structure, moderate-high contents, and high representativeness/rarity.
- The site had moderate integrity as it is in a reasonably undisturbed location. The site has low structure as it likely relates to a single deposition with little stratification. It has moderate-high

ranking for contents based on the likely material contained in the site. It has a high representativeness/rarity rating as burials are rare on the north coast of NSW.

#### **Aesthetic significance**

- The site does not meet this criterion.

#### **Summary statement of significance**

- Overall the burial is of moderate-high significance. It is of high social significance to the traditional owners. It has moderate historical significance and has moderate-high scientific significance based on its relative integrity, the materials within the site and the rarity of the site.

#### **6.2.7. IR2W4 (AHIMS ID 13-01-0115)**

#### **Social significance**

- The site IR2W4 has moderate social significance as it provides evidence of the use of the area by Aboriginal people.

#### **Historical significance**

- The site does not meet this criterion.

#### **Scientific significance**

- The site has low scientific significance as it is ranked as having low integrity, low structure, low contents and low representativeness/rarity.
- The integrity of the site is low as it has been heavily disturbed by post-contact land-use practices. The site has no structure as it comprises a single component, low density artefact scatter. The site has a low contents ranking as the site comprises of a low density artefact scatter with a common range of artefact types and the raw materials are common to the area. The site has a low representativeness ranking as artefact scatters are common within the region. The site has some educational value in regard to resource use and occupation of different elements of the landscape.

#### **Aesthetic significance**

- The site does not meet this criterion.

#### **Summary statement of significance**

- Overall IR2W4 is of low-moderate significance at the local level. It is of moderate social significance as it provides evidence of the use of the area by Aboriginal people. It has low scientific significance as it is a low density artefact scatter, with common raw materials and the overall common presence of stone artefact scatters in the region. The site has educational value regarding resource use and occupation of different elements of the landscape.



## 6.3. Summary

The significance assessment of Aboriginal cultural places is shown in Table 6-1, while the significance of archaeological sites is shown in Table 6-2.

**Table 6-1 Significance assessment for archaeological sites within or near the boundary of the project**

AHIMS ID	Name	Scientific significance	Social significance	Aesthetic significance	Historical significance	Overall significance
13-1-0114	IR2W1	Low	Low	n/a	n/a	Low
13-1-0111	Scarred/ engraved Tree	Moderate-high	High	Moderate – High	High	High
13-1-0112	IR2W2	Low	Moderate	n/a	n/a	Low-Moderate
13-01-0110	C3/2/2	Moderate –High	High	n/a	Unknown	Moderate – High
13-1-0113	IR2W3	Low	Low-Moderate	n/a	n/a	Low
13-1-0059	Saw Pit Creek/New Italy	Moderate	High	n/a	Moderate	Moderate – High
13-1-0115	IR2W4	Low	Moderate	n/a	n/a	Low-Moderate

**Table 6-2 Summary of scientific significance assessment for archaeological sites near or within the boundary of the project**

AHIMS ID	Name	Site type	Integrity	Structure	Contents	Represent- ativeness / Rarity	Scientific significance
13-1-0114	IR2W1	Isolated Artefact	Low	Low	Low	Low	Low
13-1-0111	Scarred/ engraved Tree	Scarred/ engraved tree	Moderate	Not specified	Moderate – High	High	Moderate-high
13-1-0112	IR2W2	Artefact Scatter	Low	Low	Low	Low	Low
13-01-0110	C3/2/2	Burial	Moderate	Low	Moderate – High	High	Moderate – High
13-1-0113	IR2W3	Isolated Artefact	Low	Nil	Low	Low	Low
13-1-0059	Saw Pit Creek/New Italy	Burial	Moderate	Low	Moderate – High	High	Moderate

# PUBLIC

Woolgoolga to Ballina Pacific Highway Upgrade  
Aboriginal Heritage Assessment – Iluka Road to Woodburn  
Volume 2: Appendices

AHIMS ID	Name	Site type	Integrity	Structure	Contents	Represent- ativeness / Rarity	Scientific significance
13-1-0115	IR2W4	Artefact Scatter	Low	Low	Low	Low	Low

## 7. Impact assessment

A complete impact assessment of all identified Aboriginal cultural heritage values near and within the boundary of the project is presented in the CHAR, with only impact to the archaeological sites assessed here.

This Chapter looks at sites where:

- Avoidance will occur due to changes to the boundary of the project, and site may fall partially or wholly outside the boundary of the project, or some portion may remain within the boundary of the project but be avoided by construction.
- A site or place may not be directly impacted by construction of the project, but may be at risk of indirect impacts, such as a secret place becoming more visible/accessible due to the construction of the project.
- Partial impact to a site or place would occur, with avoidance to part of the site within and/or outside of the boundary of the project.
- Impact is unavoidable and the site will be totally impacted.

Of the seven archaeological sites near or within the boundary of the project, four sites between Iluka Road and Woodburn are within the boundary of the project and will be impacted. Of the four sites to be impacted, one (IR2W2) will be partially impacted and partially avoided where it is located beyond the construction footprint. Based on the low and low-moderate significance of these sites, avoidance of impact is not justified. No Aboriginal cultural places will be impacted by the project between Iluka Road and Woodburn.. Table 7-1 presents the impact assessment.

**Table 7-1 Impacts to archaeological sites and Aboriginal cultural places within and/immediately adjacent to the boundary of the project between Iluka Road and Woodburn**

AHIMS ID	Updated name	Overall significance	Site type	Impact	Description
13-1-0114	IR2W-1	Low	Isolated artefact	Direct	All of this site (one artefact) is within the construction footprint of the project and would be subject to excavation for construction of the road. The result would be impact to the entire site and irreversible impact to its heritage values.
13-1-0111	Withheld	High	Modified tree	None	No direct or indirect impacts to this site are likely from the project.

# PUBLIC

Woolgoolga to Ballina Pacific Highway Upgrade  
Aboriginal Heritage Assessment – Iluka Road to Woodburn  
Volume 2: Appendices

AHIMS ID	Updated name	Overall significance	Site type	Impact	Description
13-1-0112	IR2W-2	Low-moderate	Artefact scatter	Direct	Part of this site (one artefact) is within the construction footprint of the project and would be subject to excavation for construction of the road. The result would be impact to approximately 20% of the site and moderate impact to its heritage values. The extent of this site extends to the east and west outside the boundary of the project, and these parts would not be impacted by the project.
13-1-0110	C3/2/2	Moderate-high	Burial	None	No direct or indirect impacts to this site are likely from the project.
13-1-0113	IR2W-3	Low	Isolated artefact	Direct	All of this site (one artefact) is within the construction footprint of the project and would be subject to excavation for construction of the road. The result would be impact to the entire site and irreversible impact to its heritage values.
13-1-0059	Saw Pit Creek / New Italy	Moderate-high	Burial	None	No direct or indirect impacts to this site are likely from the project.
13-1-0115	IR2W-4	Low-moderate	Artefact scatter	Direct	All of this site is within the construction footprint of the project and would be subject to excavation for construction of the road. The result would be impact to the entire site and irreversible impact to its heritage values.

## 8. Management recommendations

A complete set of management recommendations for all identified Aboriginal cultural heritage values near and within the boundary of the project is presented in the CHAR, with only recommendations for archaeological sites included here (Table 8-1). Impact levels presented in Table 8-1 are reflective of the current construction footprint, in the situation of any changes to this, these management recommendations must be revisited and revised as necessary to reflect changes.

**Table 8-1 Management requirements for archaeological sites within the boundary of the project between Iluka Road and Woodburn**

Project section	Name (AHIMS ID)	Site type	Overall Significance	Impact	Mitigation strategy/ recommendations
7	IR2W1 (13-1-0114)	Artefact scatter	Low	100%	All previously recorded artefacts must be recovered and removed off-site.
7	Withheld (13-1-0111)	Modified tree	High	0%	None, not impacted
8	IR2W2 (13-1-0112)	Artefact scatter	Low	20%	All previously recorded artefacts within the construction footprint must be recovered and removed off-site. Much of this site will not be impacted by the project; exclusion zones should be put in place to ensure incidental damage does not occur to these archaeological deposits. This should consist of fencing such as would exclude entry by people or plant to avoid incidental impact to the site (eg high visibility construction webbing).
8	C3/2/2 (13-1-0110)	Burial	Moderate-high	0%	None, not impacted
8	IR2W3 (13-1-0113)	Artefact scatter	Low	100%	All previously recorded artefacts must be recovered and removed off-site.
8	Saw Pit Creek / New Italy (13-1-0059)	Burial	Moderate-high	0%	None, not impacted

Woolgoolga to Ballina Pacific Highway Upgrade  
 Aboriginal Heritage Assessment – Iluka Road to Woodburn  
 Volume 2: Appendices

Project section	Name (AHIMS ID)	Site type	Overall Significance	Impact	Mitigation strategy/ recommendations
8	IR2W4 (13-1-0115)	Artefact scatter	Low	100%	<ul style="list-style-type: none"> <li>▪ Salvage excavation must be undertaken of this site within the site extent and within the boundary of the project.</li> <li>▪ A total of 60 m<sup>2</sup> to be excavated by machine. This would be undertaken with a mechanical sieve and an excavator (900 mm bucket).</li> <li>▪ Each excavation must be undertaken in 50 mm spits to sterile base deposits.</li> <li>▪ The location of excavations should be decided upon in the field by the archaeologist and registered Aboriginal Stakeholders.</li> <li>▪ All artefacts which have previously been recorded and reburied during sub-surface testing must be recovered.</li> <li>▪ All cultural material recovered during salvage would be removed off-site for detailed analysis to be undertaken. Once analysed the material would be returned to the registered Aboriginal Stakeholders for reburial or storage at a chosen location. Details of the materials nature and context should also be provided.</li> </ul> <p>All cultural material recovered would be subject to detailed analysis and inclusion in a technical report.</p>

## Appendix B Glossary

**Aboriginal cultural heritage:** The material (objects) and intangible (mythological places, dreaming stories etc) traditions and practices associated with past and present day Aboriginal communities.

**Aboriginal object:** Any deposit, object or material evidence (not being a handicraft made for sale), including Aboriginal remains, relating to the Aboriginal habitation of NSW.

**Aboriginal place:** Any place declared to be an Aboriginal place under s.94 of the *National Parks and Wildlife Act 1974*.

**Aboriginal stakeholders:** Members of a local Aboriginal land council, Aboriginal groups or other Aboriginal people who have registered their interest with the RTA to be consulted about a proposed RTA project or activity

**Aeolian:** Aeolian processes refer to the wind's alteration of the landscape.

**AFG:** An acronym for 'Aboriginal focus group'. This refers to organised meetings where Aboriginal stakeholders (who have registered their interest) can be consulted on RTA projects.

**Agate:** A form of banded chalcedony; it is characterised by layers of different colours.

**AHIMS:** Acronym for 'Aboriginal heritage information management system'. AHIMS is a register that contains information about NSW Aboriginal heritage, and it is maintained by DECCW.

**Alignment:** The general route (eg of a roadway) in plan and elevation.

**Alluvium:** A deposit left by the flow of water. It can include sediments of gravel, mud or sand.

**Angular fragment:** A flaked piece of stone that does not have characteristic features which allow for it to be positively identified as a flake, core or tool.

**Archaeological site:** A location that has evidence of past Aboriginal activity (both material and mythological/ritual).

**Archaeology:** The scientific study of human history, with focus on material remains and ethnographic evidence.

**Area of archaeological sensitivity:** A part of the landscape that contains demonstrated occurrences of cultural material. The precise level of sensitivity will depend on the density and significance of the material.

**Artefact:** An item of cultural material created by humans.

**Artefact scatter:** Where two or more stone artefacts are found within an area of potential archaeological deposit or a site.

**Axial termination:** When the force from the strike used to detach a flake from the core travels all the way through the core.

# PUBLIC

**Backed blade:** Bladelets that have one edge blunted by steep retouch to form a back.

**Basalt:** A common volcanic rock. It is fine grained (approximately 45-50 per cent silica) and rich in iron and magnesium.

**Bedrock:** A consolidated rock that is unbroken and un-weathered, located beneath soil or rock fragments.

**Bifacial flaking:** The removal of flakes from two faces of a single platform.

**Bipolar:** A method of flaking stone, especially quartz, where cores are rested upon an anvil during flaking.

**Bipolar core:** A core used to create bipolar flakes.

**Blade:** A stone flake that is at least twice as long as it is wide.

**Bioturbation:** Disturbance in soil profiles caused by living organisms, such as ants and roots.

**Bora ground:** These are usually identified as flat, mounded earth rings that were used for Aboriginal ceremonial activities.

**Bulb of percussion:** A partial cone of force produced when a flake is struck off a core. The cone occurs on the ventral (inside surface) of the flake.

**Burials:** Burial sites may be composed of a single burial, isolated individuals in a general area, or cemeteries containing many individuals.

**Carved trees:** Carved trees exhibit evidence of purposeful removal of bark, but differ from scarred trees in that geometric patterns and figures are cut into the tree. The motifs of the mid-north coast region are mostly linear geometric patterns (Craib and Bonhomme 1995: 27).

**Chalcedony:** A mineral with high silica content that has a microcrystalline structure. It is often described as „waxy’ and can be translucent. It is found in a variety of colours such as white, grey, greyish-blue or brown.

**Chert:** A fine grained rock composed of cryptocrystalline silica. It exhibits a range of textures and colours including red, green or black. Chert is easy to work and retains a sharp edge for an extensive period of time before resharpening is required. It has a low to medium fracture toughness.

**Clast:** A broken fragment of rock or crystal particle that was created either through erosion or weathering.

**Clay:** A type of sediment with particles less than 4 microns in size and that is composed of clay minerals (Keary 2001: 49).

**Conglomerate:** Is a geological term used to describe clasts that are cemented in a fine grained matrix. It is a sedimentary rock.

**Core:** A stone piece from which a flake has been removed by percussion (striking it) or by pressure. It is identified by the presence of flake scars showing the negative attributes of flakes, from where flakes have been removed.



# PUBLIC

**Cortical platform:** This term is used to describe a platform that has cortex present and may indicate that the core's surface (where the flake was struck) was previously un-worked.

**Cortex:** The outer weathered surface of stone; if smooth, it can indicate the source of stone was a pebble.

**Crenation:** Refers to a flaked artefact's vitrified surface appearance. This appearance is caused by heat exposure and materialises as relatively uniform patterns.

**Cretaceous:** A geological period that dates from approximately 145 to 65 million years ago in the Mesozoic era.

**Crushed platform:** This term is used to describe a flake that has a damaged platform and where the platform's attributes cannot be recorded as a result.

**Cultural heritage assessment report:** A report combining an Aboriginal archaeological assessment and Aboriginal cultural assessment, required to be submitted to DECCW for any Part 6 *National Parks and Wildlife Act 1974* approval or prepared for projects under Part 3A of the *Environmental Planning and Assessment Act 1979* where Aboriginal cultural heritage is identified as a key issue.

**Debitage:** Small, unmodified flakes produced as part of the flaking process, but discarded unused.

**Distal:** Term of view used to describe the lower portion of a flake in respect to where the striking force terminates.

**Distal flake:** A broken flake with the presence of a termination and the absence of a platform or impact point.

**Dolerite:** A medium to fine grained volcanic rock that is the chemical and mineral equivalent of basalt.

**Dorsal:** The side of a flake that was originally part of the core's outer surface (often referred to as the 'dorsal surface').

**Easting:** This is a measurement used to determine location. The easting is the x-coordinate and relates to the vertical lines on a map, which divide east to west. It increases in size when moving further east.

**Ecotone:** A term used to describe the transition area between two land systems.

**Edge damage:** Where the edge of a tool has been used, resulting in microscopic fractures along the surface.

**Exposure:** The level of ground exposure is based on the whether the landform is eroding, aggrading or stable.

**Faceted platform:** A faceted platform has three or more flake scars present on its surface.

**Feather termination:** A feather termination has a 'minimal thickness at the distal end and an acute angle between the dorsal and ventral surfaces' (Crabtree 1972: 64; Holdaway and Stern 2008: 129). In appearance, a feather termination becomes gradually thinner towards the end of the flake.

# PUBLIC

**Fine grained siliceous material:** A rock that has a high content of silica and that is fine grained in appearance without any further identifying characteristics.

**Flake:** A stone piece removed from a core by percussion (striking it) or by pressure. It is identified by the presence of a striking platform and bulb of percussion, not usually found on a naturally shattered stone.

**Flake scar:** Often called a „negative flake scar’, it is the remnant of a previous flake that was struck from the core. This appears on the dorsal surface of a flake.

**Flaked fragment:** This is a chipped stone artefact which cannot be classed as a flake, core or retouched flake, the reason being that the defining attributes are missing. This often happens when a core contains a number of incipient fracture planes. Artefacts that are heavily weathered or which have been shattered in a fire are also difficult to categorise.

**Flaked platform:** This term is used to describe a platform that has been worked previously; one or more flakes were removed prior.

**Floodplain:** The area covered by water during a major flood and/or the area of alluvium deposits laid down during past floods.

**Fluvial:** Pertaining to or produced from a river.

**Focalised platform:** A small platform that is intentionally prepared for percussion by overhang removal.

**Footprint:** The scale, extent or mark that a development makes on the land in relation to its surroundings.

**Geometric microliths:** Backed at one end, the other end or both, these tools are made on geometric shaped flakes, <80 mm maximum dimension.

**Geomorphic:** Relating to the structure, shape and development of landforms.

**Greywacke:** A term used to describe a form of immature sedimentary sandstone with clay content.

**Hammerstone:** A piece of stone used to knock flakes from a core. Evidence of pitting or bashing can usually be seen along some part of the margins of this artefact.

**Hinge termination:** A hinge termination occurs when “the fracture meets the surface of the core at approximately right angles to the longitudinal axis of the flake” (Holdaway and Stern 2008: 130). This can present as a rounded surface that curves downwards at the distal end of a flake.

**Holocene:** The Holocene epoch forms part of the late Quaternary period and extends from about 11,000 years ago to the present day.

**Hornfels:** Metamorphosed aphanitic sedimentary rock with extremely small particle size. Formed by high-temperature metamorphism of shale and has flaking qualities.

**Humic:** Soil that contains organic matter (from „humus’).

**Igneous:** After magma or lava cools and solidifies, it forms igneous rock. This can happen in volcanic and plutonic (under the surface of the earth) scenarios. An example of this is basalt.

# PUBLIC

***In situ***: A description of any cultural material that lies undisturbed in its original point of deposition.

**Ironstone**: A type of sedimentary rock that contains iron.

**Jurassic**: A geological period that dates from approximately 200 to 145 million years ago in the Mesozoic era.

**Knapping**: The removal of flakes and flaked pieces from a stone core by the use of percussion.

**Layer**: In stratigraphy, it is used to describe a horizon (soil, rock, charcoal) that is distinct from its surrounds.

**Land system**: Description for an area of land based on an assessment of a series of environmental characteristics including geology, geomorphology, climate, soils and vegetation.

**Loam**: Soil that contains roughly equal concentrations of silt, sand and clay.

**Longitudinally split flake**: This is a flake that is broken (split) from the point of percussion (the strike) through to the termination.

**Manuport**: An unmodified piece of stone transported to a site by humans.

**Mechanical trench**: This refers to a trench that is excavated for archaeological purposes with a mechanical excavator. Machine excavation allows for a greater sample size to be studied in PADs of low to moderate sensitivity. Due to the large amounts of soil produced from a mechanical excavator, the soil is sieved mechanically.

**Medial**: Term of view referring to the intermediate section or middle section of a broken flake.

**Medial flake**: Absence of proximal and distal margins, but with an identifiable ventral surface.

**Mesozoic**: Refers to a geological era that included three periods, two of which were the Jurassic and Cretaceous. The Mesozoic era spanned from approximately 245 to 65 million years ago.

**Metamorphism**: The process where an existing rock (which can be sedimentary or igneous) is transformed into another mineral through the application of temperature and pressure. An example of this is hornfels.

**Micron**: A micron is also known as a micrometre. It is a unit of length and has the symbol „µm”. In metres, it is  $1.0 \times 10^{-6}$  metre or 0.000001 metre.

**Midden**: The term midden is a Danish word meaning a mound of kitchen refuse. In archaeological terms, a midden refers to an accumulation of shell deposited after people had collected and eaten shellfish. These could contain estuarine and fresh water shellfish species in addition to faunal remains, stone artefacts and charcoal from cooking fires. In northern NSW in many areas, burials have been recorded in direct association with midden deposits.

**Mudstone**: A sedimentary rock formed from mud/clay.

**Muller**: A large stone artefact which differs in construction depending on the environment. These were used as an aide for processing seeds and other low return plant material or ochre.

**Multi-platform core**: Is a core with more than one identifiable platform.

# PUBLIC

**Munsell colour:** This is a colour code chart used to standardise colour specifications.

**Natural/mythological sites:** These may not exhibit any physical or archaeological evidence, but their identification is derived from local Aboriginal tradition and oral history. These sites often have mythological associations and are associated with ceremonial activity in the past. These sites are sometimes prominent landmarks, such as mountains, rivers, rocky outcrops, and headlands (eg Glenugie Peak, the Clarence and Richmond Rivers).

**Non-diagnostic:** An amorphous piece of stone that is neither a flake, flaked fragment, core or retouched flake.

**Northing:** This is a measurement used to determine location. The northing is the y-coordinate and relates to the horizontal lines on a map, which divide north to south. It increases in size when moving further north.

**Notched tool:** Flakes that exhibit a small area of retouch, forming a concave edge on lateral or distal margin.

**Oriented length:** This is a measurement taken from the point of impact through to the termination.

**Oriented thickness:** This is a measurement taken from where the oriented width and oriented length intersect.

**Oriented width:** This is a measurement taken across the middle of a flake (halfway between the point of impact and the termination).

**Overhang removal:** This occurs when a platform is prepared for striking; small flakes are struck before a flake is detached, leaving visible scars behind.

**Potential Archaeological Deposit (PAD):** A PAD is a location that is considered to have a potential for sub-surface cultural material. This is determined from a visual inspection of the site, background research of the area and the landform's cultural importance.

**pH:** A measure of the acidity or alkalinity of the soil. Neutral is indicated by a pH of 7, with strongly acidic being 0 and strongly basic (alkaline) being 14. The 'pH' is said to stand for 'potential of hydrogen'.

**Platform:** On a flake, this is a core remnant from where the flake was struck off the core.

**Platform width:** This is a measurement taken across the width of a platform between the two lateral margins of a flake.

**Platform thickness:** This is a measurement taken from the ventral to dorsal surfaces of a flake (beginning at the point of impact/percussion).

**Pleistocene:** The Pleistocene is an epoch within the early Quaternary period, extending from about 1.6 million years ago to about 11,700 years ago. The end of the Pleistocene is marked by the last of the great ice ages.

**Plunge termination:** This occurs when the ventral surface "curves markedly away from the face of a core...and continues directly into the core, removing the base of the core" (Holdaway and Stern 2008: 132). This can present as a 'J' shape when holding the flake in profile.

# PUBLIC

**Proximal:** Term of view used to describe the upper portion of a flake in respect from where it was initially struck off a core.

**Proximal flake:** A broken flake with the presence of a platform, but the absence of a termination.

**Pot-lidded:** The damage caused by exposure to extreme heat, resulting in a circular depression on the surface of a stone artefact.

**Pressure flaking:** A process to remove a flake from a core by applying pressure (from a piece of wood or bone) along the core's edge.

**Quarry:** In this report, 'quarry' can refer to a native source of stone that was mined by Aboriginal people in the past. Rock from these sites could be used to make artefacts.

**Quartz:** A mineral composed of silica with an irregular fracture pattern. The quartz used in artefact manufacture is generally semi-translucent, although it varies from milky white to glassy. Glassy quartz can be used for conchoidal flaking, but poorer quality material is more commonly used for block fracturing techniques. Quartz can be derived from water worn pebbles, crystalline or vein (terrestrial) sources.

**Quartzite:** A form of metamorphosed sandstone. It is often white or grey in colour, but can occur in other shades due to mineral impurities.

**Quaternary:** This is a geological time period spanning approximately 2 million years (to the present). It includes the two epochs, the Pleistocene and the Holocene.

**Refit:** Knapping is a reductive technology. As such, it is possible to 'refit' tools back together after breakage or knapping (ie refitting a proximal and distal flake back together or refitting a flake back to the core it was knapped from).

**Rejuvenation:** This is done to prepare a new platform on a core so that more flakes can be removed. Flakes struck for this purpose are called 'rejuvenation flakes'.

**Resource zone:** An area of the landscape or part of the environment that provides a resource (be it food or material items such as a source of stone for making artefacts) for Aboriginal people. Swamps are good examples of rich resource zones.

**Retouch:** A flake, flaked piece or core with intentional secondary flaking along one or more edges.

**Ridge straightening:** This is a "flake that has a clearly identifiable dorsal ridge and is characterised by alternating flake removals down its dorsal surface" (Holdaway and Stern 2008: 150).

**Sand:** A material composed of small grains (0.625-2.0 millimetres) (Keary 2001: 233). Sand is formed from a variety of minerals and rocks, but commonly contains silica, such as quartz.

**Sandstone:** Is a sedimentary rock formed from sand-sized grains.

**Scarred trees:** Trees that feature Aboriginal derived scars are distinct due to the scar's oval or symmetrical shape and the occasional use of steel, or more rarely, stone axe marks on the scar's surface. Scarred trees are identified by the purposeful removal of bark for use in the manufacture of artefacts such as containers, shields and canoes. The bark was also used for the construction of shelters. Other types of scarring include toeholds cut in the trunks or branches of trees for climbing purposes and the removal of bark to indicate the presence of burials in the area.

# PUBLIC

**Sediment:** Is a mineral that has undergone erosion or weathering and that is then deposited via aeolian, glacial or fluvial means.

**Sedimentary:** Sedimentary rock is formed through the accumulation of sediment deposits that are then consolidated. An example of this is mudstone.

**Shale:** A sedimentary rock of well-defined layers comprised of small particles (less than 4 microns in size) (Keary 2001: 16) sourced from weathered or eroded materials.

**Significant ground disturbance:** Means disturbance of (a) the topsoil or surface rock layer of the ground; or (b) a waterway, by machinery in the course of grading, excavating, digging, dredging or deep ripping, but does not include ploughing other than deep ripping.

**Silt:** A sediment with grains ranging from 4.0-62.5 microns in size (Keary 2001: 245). It can be found as a soil or in water.

**Single platform core:** Is a core with one identifiable platform.

**Scraper:** A stone tool, usually with steep retouch along its edges that was ethnographically used to make wooden implements or process foods and other resources.

**Silcrete:** Soil, clay or sand sediments that have silicified under basalt through groundwater percolation. It ranges in texture from very fine grained to coarse grained. At one extreme it is cryptocrystalline with very few clasts. It generally has characteristic yellow streaks of titanium oxide that occur within a grey and less commonly reddish background. Used for flaked stone artefacts.

**Slate:** A metamorphosed mudstone.

**Spit:** Refers to an arbitrarily defined strata of soil removed during excavation (often 50 millimetres to 100 millimetres in depth).

**Step termination:** This occurs when a "flake terminates abruptly in a right-angle break" (Holdaway and Stern 2008: 130).

**Stone arrangements:** On the mid-north coast of NSW, stone arrangements usually consist of cairns and/or alignments of rocks. These features are considered by Gumbaynggir people as having ceremonial significance and are often found in relatively high and/or inaccessible places such as mountain peaks and coastal headlands.

**STP:** Acronym for „shovel test pit'. Generally, this refers to a 0.5 metre x 0.5 metre pit dug by shovel, trowel or mattock. STPs are usually laid out on a grid pattern and the soil is excavated from the pit in a controlled manner, using 50-100 mm spits. After the pits are photographed, recorded and mapped, they are then backfilled.

**Stratification:** The way in which soil forms in layers.

**Stratigraphy:** The study of soil stratification (layers) and deposition.

**Sub-surface testing:** An archaeological method used to determine the cultural sensitivity of an area by excavating small (0.5 metre x 0.5 metre) pits and recording the stratigraphy, material remains (such as stone tools) and disturbance.

**Survey:** In archaeological terms, this refers to walking over a surface while studying the location of artefacts and landmarks. These are then recorded and photographed.

# PUBLIC

**Termination:** Refers to the shape of the distal end of a flake.

**Tool:** A stone flake that has undergone secondary flaking or retouch.

**TP:** Acronym for „test pit’. Generally, this refers to a 1 metre x 1 metre or 2 metre x 1 metre pit dug by shovel, trowel or mattock. Test pits were used to determine the extent of possible features (such as shell middens) in a controlled excavation of 50 millimetre spits.

**Usewear:** A pattern of wear that is left on a stone artefact due to utilisation.

**Ventral:** The side of a flake that was originally attached to the core (often called the „ventral surface’). Features such as the bulb of percussion are found on this surface of a flake.

**Visibility:** Refers to the degree to which the surface of the ground can be observed. This may be influenced by natural processes such as wind erosion or the character of the native vegetation, and by land use practices, such as ploughing or grading. It is generally expressed in terms of the percentage of the ground surface visible for an observer on foot.

**Waterholes/wells:** Waterholes or wells can be any natural or excavated water retaining feature of either historic or prehistoric significance. In order to be considered as an archaeological site, there should be some evidence of modification or use of the site.

PUBLIC

# **Appendix C Director General requirements**





Mr Bob Higgins  
General Manager Pacific Highway  
Roads and Maritime Services  
21 Prince Street  
GRAFTON NSW 2460

Contact: Lisa Chan  
Phone: (02) 9228 6226  
Fax: (02) 9228 6355  
Email: [lisa.chan@planning.nsw.gov.au](mailto:lisa.chan@planning.nsw.gov.au)  
Our ref: 11/713604-2

Dear Mr Higgins

**Environmental Assessment Requirements for the Pacific Highway Upgrade – Woolgoolga to Ballina Project (SSI – 4963)**

The Department has reviewed your request for the Director-General's environmental assessment requirements (DGRs) for the preparation of an Environmental Impact Statement for the above State Significant Infrastructure project.

I have attached a copy of the DGRs which have been prepared in consultation with relevant government authorities. I have also attached a copy of the government authorities' comments for your information. The DGRs are based on the information you have provided to date. Please note that under section 115Y(4) of the *Environmental Planning and Assessment Act 1979*, the Director-General may modify these requirements at any time.

With regard to the key issue of heritage, the research design and methodologies proposed for any physical archaeological works to be undertaken as part of the initial heritage assessments for the project should be reviewed by both the Department and the Office of Environment and Heritage in relation to Aboriginal Heritage, and the Heritage Council of NSW regarding non Aboriginal Heritage, prior to the commencement of physical disturbance of the site. This will ensure that the strategies being used are appropriate and in accordance with standard archaeological practices.

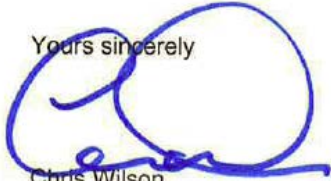
Prior to exhibiting your EIS, the Department will review the document to determine if it adequately addresses the DGRs. The Department may consult with other relevant public authorities in making this decision. If the Department considers that the EIS does not satisfactorily address the DGRs, you may be required to submit an amended EIS. Once the Department is satisfied that the requirements have been addressed, you will be contacted regarding arrangements for public exhibition.

Finally, if your proposal is likely to have a significant impact on matters of National Environmental Significance, it will require an approval under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). This approval would be in addition to any approvals required under NSW legislation and it is your responsibility to contact the Department of Sustainability, Environment, Water, Population and Communities to determine if an approval under the EPBC Act is required for your project (<http://www.environment.gov.au> or 6274 1111).

2

Your contact officer for this project, Ms Lisa Chan, can be contacted on (02) 9228 6226 or via email at [lisa.chan@planning.nsw.gov.au](mailto:lisa.chan@planning.nsw.gov.au). Please mark all correspondence regarding the project to the attention of the contact officer.

Yours sincerely



23.11.11

Chris Wilson  
**Executive Director**  
**Major Projects Assessment**  
*As delegate for the Director General*

## Environmental Assessment Requirements

Section 115Y of the *Environmental Planning and Assessment Act 1979*

<b>Application number</b>	SSI - 4963
<b>Infrastructure (project)</b>	<p><b>Pacific Highway Upgrade – Woolgoolga to Ballina</b> - the construction and operation of approximately 155 kilometres of four-lane divided carriageway, from approximately 5 kilometres north of Woolgoolga to approximately 6 kilometres south of Ballina.</p> <p>The project does not include the upgrades at Glenugie and Devils Pulpit, located between Woolgoolga and Ballina.</p>
<b>Location</b>	<p>Land generally located:</p> <ul style="list-style-type: none"> <li>(i) from Arrawarra Beach Road approximately 5 kilometres north of Woolgoolga to approximately 21 kilometres south of Grafton (the Franklins Road intersection with the Pacific Highway), and</li> <li>(ii) from approximately 13 kilometres south of Grafton (the Eight Mile Lane intersection with the Pacific Highway) to approximately 66 kilometres north of Grafton, and</li> <li>(iii) from approximately 72 kilometres north of Grafton to the Ballina Bypass approximately 6 kilometres south of Ballina,</li> </ul> <p>in the Ballina, Clarence Valley, Coffs Harbour and Richmond Valley local government areas.</p>
<b>Proponent</b>	Roads and Maritime Services
<b>Date issued</b>	23 November 2011
<b>General requirements</b>	<p>The Environmental Impact Statement (EIS) must be prepared in accordance with and meet the minimum requirements of Part 3 of Schedule 2 of the <i>Environmental Planning and Assessment Regulation 2000</i> (the Regulation) and include the following:</p> <ol style="list-style-type: none"> <li>1. the information required under clause 6 of Schedule 2 of the Regulation; and</li> <li>2. the content listed in clause 7 of Schedule 2 of the Regulation, including but not limited to: <ul style="list-style-type: none"> <li>o a summary of the environmental impact statement,</li> <li>o a statement of the objectives of the project, including a description of the strategic need, justification, objectives and outcomes for the Pacific Highway Upgrade Program, the aims and objectives of relevant strategic planning and transport policies, including <i>NSW 2021</i>, the <i>Far North Coast Regional Strategy</i> and the <i>Mid North Coast Regional Strategy</i>, and the cumulative and synergistic impacts associated with the Pacific Highway Upgrade Program as a whole, and</li> <li>o an analysis of feasible alternatives to the carrying out of the project and project justification, including: <ul style="list-style-type: none"> <li>➤ an analysis of alternatives/ options considered, having regard to the project objectives (including an assessment of the environmental costs and benefits of the project relative to alternatives and the consequences of not carrying out the project), and the provision of a clear discussion of the route development and selection process, the suitability of the chosen alignment and whether or not the project is in the public interest, and</li> <li>➤ justification for the preferred project taking into consideration the objects of the <i>Environmental Planning and Assessment Act 1979</i>.</li> </ul> </li> </ul> </li> </ol>

	<ul style="list-style-type: none"> <li>○ an analysis of the project, including an assessment, with a particular focus on the requirements of the listed key issues, in accordance with clause 7(1)(d) of Schedule 2 of the Regulation (where relevant), including an identification of how relevant planning, land use and development matters (including relevant strategic and statutory matters) have been considered in the impact assessment (direct, indirect and cumulative impacts) and/or in developing management/ mitigation measures, and</li> <li>○ detail how the principles of ecologically sustainable development will be incorporated in the design, construction and ongoing operation phases of the project.</li> </ul>
<p><b>Key issues</b></p>	<p>The EIS must address the following specific matters:</p> <p><b>Traffic and Transport</b> – including but not limited to:</p> <ul style="list-style-type: none"> <li>• demonstration of how the preferred route and road design meets the traffic and transport objectives of the project;</li> <li>• construction traffic impacts, including:             <ul style="list-style-type: none"> <li>○ the identification of routes and the nature of existing traffic on these routes,</li> <li>○ an assessment of construction traffic volumes (including spoil haulage/ delivery of materials and equipment to the road corridor and ancillary facilities), and</li> <li>○ potential impacts to the regional and local road network (including safety and level of service) and potential disruption to existing public transport/ school bus services and access to properties and businesses;</li> </ul> </li> <li>• operational traffic and transport impacts to the local and regional road network, including:             <ul style="list-style-type: none"> <li>○ changes to access arrangements/ service roads to properties, businesses and State forest road network,</li> <li>○ changes to local road connectivity and impacts on local traffic arrangements, road capacity/ safety, service roads and modified access to the upgraded highway (including potential impacts of changed traffic arrangements on public transport/ school bus services and access for emergency services),</li> <li>○ traffic capacity of the project and its ability to cater for predicted future growth. Consideration should be given to what effect potential major land use changes in the locality may have on the traffic assessment outcomes, and</li> <li>○ opportunities for the provision of pedestrian and cycle access and connections along the highway and to adjoining communities; and</li> </ul> </li> <li>• impacts on maritime use of the Richmond and Clarence rivers and safety of navigation for water based traffic.</li> </ul> <p><b>Biodiversity</b> - including but not limited to:</p> <ul style="list-style-type: none"> <li>• impacts on the biodiversity values of the site and adjoining areas, including flora and fauna and their habitat (terrestrial, riparian and aquatic);</li> <li>• impacts on Endangered Ecological Communities, critical habitat, threatened and protected species, populations and their habitats, listed under both State and Commonwealth legislation that have been recorded or considered likely to occur on the site and surrounding land based on the presence of suitable habitat, and whether the proposal or specific aspects of the proposal constitute Key Threatening Processes in terms of the <i>Threatened Species Conservation Act 1995</i>;</li> <li>• targeted surveys of threatened flora and fauna species and their habitat that are known or likely to occur within the project's study area based on the presence of suitable habitat. The targeted surveys must include but not limited to the following species:</li> </ul>

	<ul style="list-style-type: none"> <li>○ Oxleyan Pygmy Perch (<i>Nannoperca oxleyana</i>), Purple Spotted Gudgeon (<i>Mogurnda adspersa</i>),</li> <li>○ Squirrel Glider, Yellow-bellied Glider, Brush-tailed Phascogale, Eastern Pygmy-possum,</li> <li>○ Wallum Froglet, Olongburra Frog, Pouched Frog, Giant-barred Frog, Green-thighed Frog, Green and Golden Bell Frog,</li> <li>○ White-crowned Snake, Pale Headed Snake, Stephen's Banded Snake,</li> <li>○ Microbats – all threatened species,</li> <li>○ Forest Owls – Masked, Sooty, Barking, Powerful, Grass Owl,</li> <li>○ Brolga, Black-necked Stork, Comb-crested Jacana, Magpie Goose, Black Bittern,</li> <li>○ Bush Stone – curlew, Albert's Lyrebird, Grey-crowned Babbler,</li> <li>○ Koala, Long-nosed Potoroo, Common Planigale, Rufous Bettong, and</li> <li>○ Emu (<i>Dromaius novaehollandiae</i>).</li> </ul> <p>Details of the survey methodology employed, including survey effort and timing and representativeness for the species targeted, should be identified;</p> <ul style="list-style-type: none"> <li>• impacts on wildlife and habitat corridors, and habitat fragmentation and details of mitigation measures, having regard to the range of fauna species and opportunities for connectivity (terrestrial, arboreal and aquatic) across the project;</li> <li>• impacts on/from vegetation loss, weed infestation (terrestrial and aquatic), edge effects, groundwater dependent ecosystems, wetlands including State Environmental Planning Policy No. 14 – Coastal Wetlands, and aquatic and riparian species and their habitats;</li> <li>• consideration of regional scale cumulative impacts and the significance of the biodiversity impacts of the project in the context of the Pacific Highway Upgrade Program;</li> <li>• details of how impacts would be managed during construction and operation for project components (including ancillary facilities), the suitability of measures and adaptive management and maintenance protocols and monitoring programs;</li> <li>• the details of available offset measures to compensate the biodiversity impacts of the proposal where offset measures are proposed to address residual impacts, consistent with the <i>Principles for the use of biodiversity offsets in NSW</i>; and</li> <li>• taking into account the <i>Draft Guidelines for Threatened Species Assessment</i> (Department of Environment and Conservation, 2005); <i>Threatened Species Survey and Assessment Guidelines: Field Survey Methods for Fauna - Amphibians</i> (DECCW, 2009); and <i>Threatened Biodiversity Survey and Assessment: Guidelines for Developments and Activities – Working Draft</i> (DEC, 2004).</li> </ul> <p><b>Noise and Vibration</b> – including but not limited to:</p> <ul style="list-style-type: none"> <li>• construction noise and vibration impacts, including impacts from construction traffic, ancillary facilities, batch plants and blasting. The EIS must identify sensitive receivers and assess construction noise/ vibration generated by representative construction scenarios focusing on high noise generating works. Where work hours outside of standard construction hours are proposed, clear justification and detailed assessment of these work hours must be provided, including alternatives considered, mitigation measures proposed and details of construction practices, work methods, compound design, etc;</li> <li>• cumulative impacts during construction, having regard to other developments (both existing and approved) in the locality, the staged construction of the project and the construction of adjoining Pacific Highway Upgrade projects;</li> </ul>
--	--

- operational road traffic noise impacts of the project (including service roads and rest areas) on sensitive receivers, including reflective noise impacts from proposed noise mitigation barriers and bridges; and
- taking into account the following guidelines, as relevant: *NSW Road Noise Policy* (Department of Environment, Climate Change and Water, 2011), *Interim Construction Noise Guideline* (Department of Environment and Climate Change, 2009), *Assessing Vibration: A Technical Guideline* (Department of Environment and Conservation, 2006), and *Technical Basis for Guidelines to Minimise Annoyance Due to Blasting Overpressure and Ground Vibration* (Australian and New Zealand Environment and Conservation Council, 1990).

**Soils, Sediments and Water** – including but not limited to:

- impacts on surface water flows, quality and quantity, with particular reference to any likely impacts on surrounding water bodies, wetlands and their habitats, including potential indirect impacts on the Solitary Island Marine Park by works in the Arrawarra Creek and Corindi River catchments;
- groundwater impacts, taking into consideration local impacts at deep cuttings and fill locations, and cumulative impacts on regional hydrology. The assessment shall consider: the extent of drawdown, impacts to groundwater characteristics, quality, quantity, and connectivity, discharge and recharge rates, and implications for surface flows, groundwater users, groundwater dependent ecosystems and wetlands;
- impacts to the Rous Water Regional Water Supply (Woodburn) bore fields drinking water source, taking into account discharge/ recharge rates and groundwater yield, and consideration of the relevant public health and environmental water quality criteria specified in the *Australian and New Zealand Guidelines for Fresh and Marine Water Quality 2000* ((Australian and New Zealand Environment and Conservation Council) and the *Australian Drinking Water Guidelines 2004* (National Health and Medical Research Council and the Natural Resource Management Ministerial Council);
- flooding impacts and characteristics, to and from the project, with an assessment of the potential changes to flooding behaviour (levels, velocities and direction) and impacts on bed and bank stability, through flood modelling, including:
  - hydraulic modelling for a range of flood events,
  - description, justification and assessment of design objectives (including bridge, culvert and embankment design),
  - an assessment of afflux and flood duration (inundation period) on land, infrastructure, property and business operations (including agricultural land and stock movement to flood refuges and evacuation routes), hazard and emergency service within the affected area, and future development potential of access affected land, and
  - consideration of the effects of sea level rise, changes to rainfall frequency and/or intensity as a result of climate change, including an assessment of the capacity of proposed (and existing) stormwater drainage structures;
- waterways to be modified as a result of the project, including ecological, hydrological and geomorphic impacts (as relevant), including temporary crossings, and measures to rehabilitate the waterways to pre-construction conditions or better, including fish passage requirements consistent with *Policy and Guidelines for Fish Friendly Waterway Crossings* (Department of Primary Industries, 2004);
- identification and assessment of soil characteristics and properties that may impact or be impacted by the proposal; and
- identification and assessment of soft soils, soil contamination, acid

sulfate soils, and details of erosion and sedimentation control measures.

**Heritage** – including but not limited to:

- impacts to *Aboriginal heritage* (including cultural and archaeological significance), in particular impacts to Aboriginal heritage sites identified within or near the project should be assessed. Where impacts are identified, the assessment shall:
  - outline the proposed mitigation and management measures (including measures to avoid significant impacts and an evaluation of the effectiveness of the measures) generally consistent with the *Draft Guidelines for Aboriginal Cultural Heritage Impact Assessment and Community Consultation* (Department of Environment and Conservation, 2005),
  - be undertaken by a suitably qualified heritage consultant(s),
  - demonstrate effective consultation with Aboriginal communities in determining and assessing impacts and developing and selecting options and mitigation measures (including the final proposed measures), and
  - develop an appropriate archaeological assessment methodology, including research design, to guide physical archaeological test excavations of the areas of PAD identified in a manner that establishes the full spatial extent and significance of any archaeological evidence across each area of PAD, and include the results of these excavations; and
- impacts to *State and local historic heritage* (including archaeology, heritage items conservation areas and natural areas), in particular impacts to the New Italy Settlement and High Conservation Value Old Growth Forest should be assessed. Where impacts to State or locally significant historic heritage items are identified, the assessment shall:
  - outline the proposed mitigation and management measures (including measures to avoid significant impacts and an evaluation of the effectiveness of the mitigation measures) generally consistent with the guidelines in the NSW Heritage Manual (1996),
  - be undertaken by a suitably qualified heritage consultant(s) (note: where archaeological excavations are proposed the relevant consultant must meet the NSW Heritage Council's Excavation Director criteria),
  - include a statement of heritage impact for all heritage items (including significance assessment),
  - consider impacts from vibration, demolition, archaeological disturbance, altered historical arrangements and access, landscape and vistas, and architectural noise treatment, and
  - develop an appropriate archaeological assessment methodology, including research design, to guide physical archaeological test excavations and include the results of these excavations.

**Visual Amenity, Urban Design and Landscaping** – including but not limited to:

- a description of the visual significance of the affected landscape, particularly where the corridor traverses greenfield areas;
- an assessment of the visual impact of the project on the landscape character of the area, including built form (materials and finishes) and the urban design (height, bulk and scale) of key components including bridge crossings, floodplain embankments, interchanges, and views to and from the project; and
- details of landscaping treatment and design (including noise barriers, retaining walls and landscaping) consistent with the overall design of the Pacific Highway Upgrade Program and integration with the existing (and desired) character of affected localities;

	<ul style="list-style-type: none"> <li>taking into account the <i>Noise Wall Design Guideline</i> (Roads and Traffic Authority, 2006).</li> </ul> <p><b>Land Use and Property</b> - including but not limited to:</p> <ul style="list-style-type: none"> <li>impacts on directly affected properties and land uses, including impacts related to access, land use, property infrastructure, future development potential, property acquisition and land sterilisation and severance;</li> <li>the agricultural sector taking into account fragmentation and potential loss of regionally significant farmland as identified in the <i>Northern Rivers Farmland Protection Project</i> (Department of Planning, 2005) and <i>Mid North Coast Farmland Mapping Project</i> (Department of Planning, 2008), food production, stock/ agricultural diseases and the impact on quarantined properties of a revised road network, and impacts on travelling stock routes/ reserves (as relevant);</li> <li>the operation of State forest estate, including potential for fragmentation and sterilisation of resources, and access by forestry and other users;</li> <li>impacts on Crown land, reserves and assets, and land reserved under the <i>National Parks and Wildlife Act 1974</i>;</li> <li>impacts on natural resources, including mining, petroleum production and extractive resources utilisation;</li> <li>impacts on commercial fishing access and aquaculture operations, including impacts on oyster priority areas in accordance with the <i>NSW Oyster Industry Sustainable Aquaculture Strategy 2006</i> (Department of Primary Industries); and</li> <li>identification of services and utilities to be relocated.</li> </ul> <p><b>Social and Economic</b> - including but not limited to:</p> <ul style="list-style-type: none"> <li>social and economic impacts on local and regional communities (including towns and villages directly impacted by the project and those bypassed by the project);</li> <li>impact on highway-based businesses and agribusinesses from traffic, access, property, public domain and amenity related changes;</li> <li>impact of the project on tourist and recreational access and use of towns and villages, National Parks and nature reserves, State forests and waterways; and</li> <li>connectivity (including pedestrian and cycleway opportunities) and contiguity of existing and planned settlement and activity clusters.</li> </ul> <p><b>Environmental Risk Analysis</b> – notwithstanding the above key assessment requirements, the EIS must include an environmental risk analysis to identify potential environmental impacts associated with the project (construction and operation), proposed mitigation measures and potentially significant residual environmental impacts after the application of proposed mitigation measures. Where additional key environmental impacts are identified through this environmental risk analysis, an appropriately detailed impact assessment of this additional key environmental impact must be included in the EIS.</p>
<p><b>Consultation</b></p>	<p>You should undertake an appropriate and justified level of consultation with relevant parties during the preparation of the EIS, including but not limited to:</p> <ul style="list-style-type: none"> <li>local, State and Commonwealth government authorities, including the:             <ul style="list-style-type: none"> <li>Department of Primary Industries (Agriculture, Forests, Fisheries, Minerals and Crown Land divisions),</li> <li>Heritage Council of NSW,</li> <li>Marine Parks Authority NSW,</li> <li>Maritime Services,</li> <li>NSW Office of Water,</li> <li>Office of Environment and Heritage,</li> <li>Transport for NSW, and</li> <li>Ballina, Clarence Valley, Coffs Harbour and Richmond Valley</li> </ul> </li> </ul>



# PUBLIC

	<p>councils;</p> <ul style="list-style-type: none"><li>• specialist interest groups, including Local Aboriginal Councils, Aboriginal stakeholders and industry/ growers associations, mining and petroleum title holders;</li><li>• utilities and service providers, including Rous Water; and</li><li>• the public, including community groups and adjoining and affected landowners.</li></ul> <p>The EIS must describe the consultation process, document consultation undertaken and identify the issues raised (including where these have been addressed in the EIS).</p>
<b>Further Consultation after 2 years</b>	<p>If you do not lodge an EIS for the development within 2 years of the issue date of these DGRs, you must consult with the Director General in relation to the preparation of the EIS.</p>



**Heritage Council**  
of New South Wales

3 Marist Place  
Parramatta NSW 2150  
Locked Bag 5020  
Parramatta NSW 2124  
DX 8225 PARRAMATTA

Telephone: 61 2 9873 8500  
Facsimile: 61 2 9873 8599  
heritage@planning.nsw.gov.au  
www.heritage.nsw.gov.au

Contact: Siobhan Lavelle  
Phone: 02 9873 8546  
Fax: 02 9873 8599  
Email: Siobhan.Lavelle@heritage.nsw.gov.au

Mr Michael Young  
Team Leader – Roads  
Infrastructure Projects  
Department of Planning & Infrastructure  
GPO Box 39  
SYDNEY NSW 2001

Attention: Lisa Chan



Dear Mr Young

**Subject: State Significant Infrastructure – Pacific Highway Upgrade – Woolgoolga to Ballina (SSI - 4951) – Review of Draft Director General's Environmental Assessment Requirements**

Reference is made to a letter dated 17 October 2011 advising that the Roads and Traffic Authority (RTA) have lodged a State Significant Infrastructure application for the above project.

Your letter of 17 October 2011 included a copy of the Draft Director General's EARs and a copy of the RTA report 'Woolgoolga to Ballina Upgrading the Pacific Highway State Significant Infrastructure Application Report' dated October 2011.

The RTA report indicates that there are potentially 2 State Listed Items affected by the project:  
New Italy Settlement SHR 1648  
High Conservation Value Old Growth Forest SHR 1487

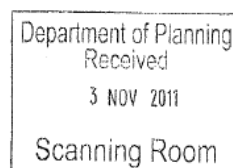
and that 12 locally Listed items are affected, plus a further 19 unlisted items which have been identified by the project research to date.

It is noted that the Draft EARs for the Project have identified Heritage as a key issue, and that the requirements listed for Heritage in the EARs indicate a reasonably comprehensive range of matters to be considered as part of the Environmental Assessment.

Nevertheless, it is recommended that the draft requirements should be strengthened by the addition of the following matters:

1. the requirements should include preparation of Archaeological Assessments and Archaeological Research Designs as well as Statements of Heritage Impact for built heritage items.

Helping the community conserve our heritage



Archaeological Research Designs would be needed to guide any physical archaeological works which may be undertaken as part of the further assessments needed for the project.

2. The Research Design and methodology proposed for any physical archaeological works to be undertaken as part of the initial assessments for the project should be reviewed by both the Department and the Heritage Council prior to the commencement of physical works to ensure that the strategies being used are appropriate and in accordance with standard archaeological practice for State listed sites and areas.

The existing EA requirements under Consultation do not currently include the Heritage Council of NSW amongst those to be consulted, only the Office of Environment & Heritage. As 2 State Listed items are potentially affected by the project it is recommended that the Heritage Council of NSW be added to the list of bodies to be consulted as part of the Project.

I trust that the advice in this letter will be of assistance to you. Thank you for referring the draft Director General's EARs for comment.

If you have any questions regarding the above, please feel free to contact Siobhan Lavelle at the Heritage Branch using the details provided with this letter.

Yours sincerely



31/10/2011

**Vincent Sicari**  
Manager  
Conservation Team  
Heritage Branch  
Office of Environment and Heritage  
Department of Premier & Cabinet  
**AS DELEGATE OF THE NSW HERITAGE COUNCIL**



Department of  
Primary Industries  
Catchments & Lands

NSW Planning & Infrastructure  
GPO Box 39  
Sydney, NSW 2001

**Crown Lands Division  
Far North Coast**

Level 1, 76 Victoria Street  
PO Box 272  
GRAFTON 2460  
T (02) 6640 3400  
F (02) 6642 8124  
[www.lands.nsw.gov.au](http://www.lands.nsw.gov.au)

2 November 2011

**Attention:** Lisa Chan

**Re: Pacific Highway Upgrade – Woolgoolga to Ballina, Environmental Assessment Requirements (EAR's)**

I refer to information received by Department of Primary Industries – Catchment and Lands (CLD) from Planning and Infrastructure in regard to environmental assessment requirements for the redevelopment of the Pacific highway from Ballina to Woolgoolga.

CLD is the primary stakeholder in the administration of the Crown estate in the State of New South Wales.

The proposal will affect a significant amount Crown land reserved for a variety of purposes, which are under various management regimes and tenures. Crown land should be suitably addressed in all aspects of the environmental assessment (EA).

**Environmental Assessment (EA) Requirements** – CLD agree with the identified key issues in the report but request additional information and focus on the Crown estate.

**Crown Reserves** – The EA must acknowledge the impacts the proposal will have on Crown reserves and how these impacts will be mitigated. Information required includes;

- Accurate identification of all affected Crown lands including ancillary facilities and construction material requirements
- Loss of access
- Loss of practical use – i.e. Flood reserves being severed and impacting on the carrying capacity for grazing in times of flood.

**Crown Waterways** - The beds of most tidal waters and many of the beds of non-tidal waters (including rivers, streams and lakes) comprise Crown lands that are managed by CLD. Crown Waterways affected by the proposal need to be identified as such in the EA.

The proposed construction of bridges across navigable waterways in accordance with *Roads Act 1993 (Section 78)*, will require easements over footings in Crown waterways below MHWM, to be acquired under *Land Acquisition (Just Terms Compensation) Act 1991*.

**Crown public roads** – The EA must identify legal practical access of affected or alienated roads as required. The differentiation between Crown public roads and Council public roads should also be addressed in the final assessment.

# PUBLIC

- Crown roads affected and held under enclosure permits – Will require consultation with holders and may be subject to disposal under the CLD Roads Reform project. Landholders may have freehold title over disposed roads.
- Crown roads not held under enclosure permits - may also be subject to disposal under the CLD Roads Reform project.

The RTA is required to clarify proposed closure and acquisition of all Crown roads.

**Process** - If and when construction is approved, but prior to works commencing on the subject Crown estate, it will be necessary for the RTA to secure a suitable tenure from the Minister under the Crown Lands Act. The tenure will provide the RTA with required access and occupation of the subject lands until such time as the land has been acquired.

The ability of the Minister to consider tenure over the land is in part dependent on the resolution of any claims to the land under the Aboriginal Land Rights Act and the views of any controlling authority.

Lands Acquisition -It will be necessary for the RTA to acquire all affected Crown lands. The amount of compensation to be payed will need to be agreed upon prior to concurrence to acquisition.

**CLD Consultation** – early identification of land status by the RTA will address status issues in relation to the proposal. It is recommended that the RTA meet with CLD continually throughout each phase of the project to identify any issues that may require further consultation with various Crown land managers and other interested parties.

## **Aboriginal Land Claims**

There are a number of Crown lands within the project area under current Aboriginal Land Claims. Early identification of the effected Crown lands will enable the RTA to identify and consult with the claimants as the project progresses.

If you have any further queries, feel free to contact me on 02 66403431 or [daniel.cupitt@lands.nsw.gov.au](mailto:daniel.cupitt@lands.nsw.gov.au)

Yours sincerely



Daniel Cupitt  
Acting - Group Leader Natural Resources and Property Services  
Far North Coast  
T: (02) 6640 3431

For and on behalf of the Minister for Primary Industries



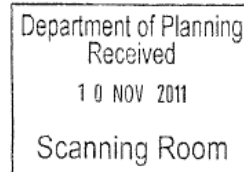
Office of  
Environment  
& Heritage

Our reference: DOC 11/49632  
Contact : Craig Harré  
Date: 4<sup>th</sup> November 2011



PCU027802

Mr Michael Young,  
Infrastructure Projects  
Department of Planning and Infrastructure  
GPO Box 39  
SYDNEY NSW 2000



Dear Mr Young,

**Re: Pacific Highway Upgrade – Woolgoolga to Ballina Draft Environmental Assessment Requirements Application number SSI – 4963.**

Thank you for the opportunity to review and comment on the key issues for the draft Environmental Assessment Requirements for the Woolgoolga to Ballina Pacific Highway Upgrade received by Office of Environment and Heritage (OEH) by email from Senior Planning Officer, Lisa Chan 17<sup>th</sup> October 2011.

OEH has considered the information provided by the Department of Planning and Infrastructure (DoPI) and has provided comments on the draft Director General Requirements in **Attachment A** whilst additional information required to assess the project is detailed in **Attachment B**. The proponent should ensure that the Environmental Impact Statement (EIS) is sufficiently comprehensive and contains sufficient information to allow OEH to determine the full extent of the impact(s) of the proposal.

The key information requirements for the project are summarised below:

1. the environmental impacts of the project. Sufficient information must be provided to ensure that OEH can take matters that are outlined in Section 45 of the *Protection of the Environment Operations Act 1997* into consideration, with respect to water, soils, air, noise and waste;
2. the impacts of the project on threatened species, populations and their habitat, endangered ecological communities, critical habitat and the maintenance of connectivity for fauna species. The nature and extent of impacts to biodiversity values resulting from the proposal will assist evaluation of proposed mitigation measures and define elements that may need to be addressed within a biodiversity offset package;
3. the impacts of the project on Aboriginal cultural heritage values. This information is required to enable completion of an adequate assessment of the impacts of the project on the Aboriginal cultural heritage values of the route, in particular impacts upon Aboriginal sites, potential archaeological deposits and the cultural values attached to waterways located along the preferred route;

4. the actions that will be taken to avoid, minimise, mitigate impacts or compensate for unavoidable impacts identified in 1-3 above;

The proponent should also be aware that any commitments made in the EIS may be formalised as approval conditions. Consequently, pollution control or conservation measures should not be proposed if they are impractical, unrealistic or beyond the financial viability of the development. It is important that all conclusions are supported by adequate data.

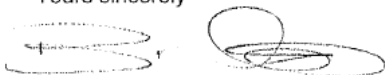
Based on information provided, the proponent will require an environment protection licence to carry out the scheduled activity of road construction. The proponent will need to make a separate application to OEH to obtain this licence if planning project approval is granted.

Due to the complexity of this proposal, it is also strongly recommended that the proponent consult with OEH during the assessment period with regard to the assessment of Aboriginal cultural heritage and biodiversity values potentially affected by the proposal.

OEH requests that three copies of the EIS are provided for assessment. These documents should be lodged at OEH's North Coast Regional Office, PO Box 498, Grafton 2460.

Should you have any questions in relation to air, noise or water quality matters please contact Bryce Gorham on (02) 6640 2509. If you have any queries regarding Aboriginal cultural heritage, please contact Nick Pulver on (02)6659 8225. Finally, if you have any questions regarding threatened species and biodiversity matters, please contact Craig Harré on (02) 6659 8223.

Yours sincerely



**BRETT NUDD**  
Manager North Coast Region  
Environment Protection and Regulation Group

## Attachment C – Relevant Guidelines

### Water quality

- National Water Quality Management Strategy: Australian and New Zealand Guidelines for Fresh and Marine Water Quality (ANZECC 2000)
- NWQMS Australian Guidelines for Water Quality Monitoring and Reporting (ANZECC 2000)
- The relevant targets within the State Water Management Outcomes Plan

### Wastewater

- National Water Quality Management Strategy: Guidelines for Sewerage Systems - Effluent Management (ARMCANZ/ANZECC 1997)
- National Water Quality Management Strategy: Guidelines for Sewerage Systems – Use of Reclaimed Water (ARMCANZ/ANZECC 2000)
- Environmental Guidelines for the Utilisation of Treated Effluent by Irrigation (NSW DEC 2004)
- Environment and Health Protection Guidelines: 'Onsite Sewage Management for Single Households', February 1998 (Silver Book).
- *NSW Guidelines for Urban & Residential Use of Reclaimed Water* (NSW Water Recycling Coordination Committee, 1993).

### Stormwater

- Managing Urban Stormwater: Soils and Construction (NSW Landcom, 2004)
  - Managing Urban Stormwater: Source Control (EPA 1998)
  - Managing Urban Stormwater: Treatment Techniques (EPA 1998).
- (Note: some of these documents will be revised)

### Groundwater

- State Groundwater Policy Framework Document (DLWC 1997)
- The NSW State Groundwater Quality Protection Policy (DLWC 1998)
- (Draft) NSW Groundwater Quantity Management Policy
- NSW Groundwater Dependent Ecosystems Policy (DLWC 2002)
- National Water Quality Management Strategy Guidelines for Groundwater Protection in Australia (ARMCANZ & ANZECC 1995)

### Contaminated Land

- Managing Land Contamination: Planning Guidelines - SEPP55 - Remediation of Land, Department of Urban Affairs and Planning and NSW EPA, 1998:
- Contaminated Sites – Guidelines for Consultants Reporting on Contaminated Sites (Environment Protection Authority (EPA) 1997);
- Contaminated Sites – Guidelines on Significant Risk of Harm and Duty to Report (EPA, 1999).

### Noise and vibration

- NSW Industrial Noise Policy (EPA, 1999)
- NSW Environmental Criteria for Road Traffic Noise (EPA, 1999)
- Interim Construction Noise Guideline (DECCW July 2009.)
- Technical Basis to Guidelines to Minimise Annoyance Due to Blasting Overpressure and Ground Vibration (ANZECC 1990)
- Assessing vibration: a technical guideline (DEC 2006)
- Environmental Noise Control Manual (RTA 2001)

### Acid Sulfate Soils

- Acid Sulfate Soils Manual (Acid Sulfate Soils Management Advisory Committee 1998)



- National Strategy for the Management of Coastal Acid Sulfate Soils (Agricultural and Resource Management Council of Australia and New Zealand, ANZECC and Ministerial Council Forestry, Fisheries and Aquaculture 2000)

#### **Assessing Threatened Species Impacts**

- Draft Guidelines for Threatened Species Assessment - Available from Department of Planning.
- Threatened Biodiversity Survey and Assessment: Guidelines for Developments and Activities, Working Draft November 2004. Available from the DECC website.
- *Guidelines for the Translocation of Threatened Plants in Australia* available from the Australian Network for Plant Conservation (ANPC), Australian Department of Environment and Heritage.

#### **Assessing Aboriginal Cultural Heritage Impacts**

- Draft Guidelines for Aboriginal Cultural Heritage Impact Assessment and Community Consultation - Available from Dept of Planning
- Interim Community Consultation Requirements for Applicants - [www.nationalparks.nsw.gov.au/npws.nsf/Content/Protecting+Aboriginal+objects+and+places](http://www.nationalparks.nsw.gov.au/npws.nsf/Content/Protecting+Aboriginal+objects+and+places)
- Aboriginal Cultural Heritage Standards and Guidelines Kit  
<http://www.nationalparks.nsw.gov.au/npws.nsf/Content/Protecting+Aboriginal+objects+and+place>
- DECC section 87/section 90 application form  
<http://www.nationalparks.nsw.gov.au/npws.nsf/Content/Protecting+Aboriginal+objects+and+place>