UPGRADING THE PACIFIC HIGHWAY

Woolgoolga to Ballina Planning Alliance

# UPGRADING THE PACIFIC HIGHWAY

## Woolgoolga to Ballina Upgrade

## Historical (non-Aboriginal) Heritage Assessment

## November 2012

## FINAL

NSW GOVERNMENT Transport Roads & Maritime Services

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SINCLAIR KNIGHT MERZ SKM

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# Executive summary

The NSW Roads and Maritime Services is seeking approval to upgrade around 155 kilometres of the Pacific Highway from Woolgoolga to Ballina. The Pacific Highway Woolgoolga to Ballina upgrade project (the project) would achieve four lanes of divided highway from about five kilometres north of Woolgoolga to about six kilometres south of Ballina.

This assessment addresses the Director-General's environmental assessment requirements for the project for non-Aboriginal historical heritage. Comments and recommendations on the Director-General's environmental assessment requirements from the Heritage Council of NSW were also addressed in the assessment.

The overall approach to the assessment is generally consistent with the NSW Heritage Manual (NSW Heritage Office 1996). The assessment comprised identifying heritage items within and adjacent to the project boundary through a review of previous heritage studies, searches of relevant heritage register and schedules, and by undertaking field survey. The significance of each heritage item was assessed in accordance with NSW Heritage Office (2001) guidelines. The impact of the project on each heritage item was then assessed, both for direct and indirect impacts including impacts from vibration, demolition, archaeological disturbance, altered historical arrangements and access, landscape and vistas, and architectural noise treatment. Statements of heritage impact were prepared in accordance with NSW Heritage Office (1996) guidelines for each heritage item where impacts would occur. Appropriate management measures were identified to avoid, minimise and manage impacts to each heritage item.

A thematic contextual history of the region was developed, and key historical themes identified. A predictive model of the types of historical heritage places was developed from the thematic history and historical themes. This was used in developing the field survey strategy and undertaking significance assessments.

A total of 38 heritage items were identified as being within or near the project boundary (Table E-1). Assessment of the heritage significance of these items identified three of state heritage significance, 27 of local heritage significance and eight that did not meet the criteria thresholds for either local or state heritage significance.

Impact assessment revealed that of the 30 heritage items with state or local heritage significance, 12 would not be impacted by the project. The other 18 heritage items (comprising two of state heritage significance and 16 of local heritage significance) would be subject to a range of direct and indirect impacts - 16 heritage items during the construction phase and nine heritage items during the operational phase of the project. The mitigation measures that would be put in place for these 18 heritage items would result in the following range of outcomes:

- Protective measures resulting in avoidance of impacts to heritage significance.
- Relocation of heritage item while maintaining heritage significance.
- Realisation of the information/research potential of heritage item through archaeological salvage excavation or archival recording prior to destruction.

This assessment also considers the Pacific Highway itself from a heritage perspective. The assessment examines the historical background of the highway, the known physical remains and former routes of the Highway, undertakes a significance assessment of the Highway as a whole, and the impacts of this project on the Highway overall. The majority of the remaining evidence of the earlier highway route and infrastructure would not be impacted by the project. While in some instances the physical materials of earlier highway remnants would be impacted, the route that the earlier highway took is well documented and would still be visible in the landscape. Overall the impact of the project on the State heritage significance of the Pacific Highway is negligible. Therefore there are no mitigation measures required for the Pacific Highway.

Ancillary sites for the project have been subject to desktop assessment. Of the 93 ancillary sites proposed for the project, nine were identified as having a medium likelihood of the presence of previously unrecorded or unknown historical heritage sites. None of the ancillary sites contained any listed historical heritage sites. Management and mitigation measures are identified in Section 6.1.4 which outline field survey of these nine sites (and significance assessment and impact assessment where heritage items are identified) would be undertaken in parallel with the Environmental Impact Statement, to adequately manage the potential impacts.

General mitigation measures for the management of the potential impacts on non-Aboriginal heritage items from the project would be implemented. These include a procedure for managing unexpected finds of historical heritage materials, features or deposits, a procedure for managing the discovery of human remains, and the provision of heritage induction training for contractors working on the construction of the project.

**Table E-1: Identified heritage items.**

| Project section | Item no | Item name | Heritage significance | Impact description | Mitigation measures |
|---|---|---|---|---|---|
| 1 | 1 | Stockyard and sheds, south of Corindi River, Corindi Beach | Does not meet thresholds | n/a | n/a |
| 1 | 2 | House, sheds and stockyards, Halfway Creek | Local | Physical damage due to contact with road construction materials. Architectural noise treatment. | Barrier fencing, dust control, dilapidation survey. Heritage advice on selection of specific noise controls. |
| 1 | 3 | Tree stumps, Milleara/Halfway Creek | Local | n/a | n/a |
| 1 | 4 | Schoolhouse, Halfway Creek | Does not meet thresholds | n/a | n/a |
| 2 | 5 | Stockyards north-west of Lemon Tree Road, Halfway Creek | Does not meet thresholds | n/a | n/a |

| Project section | Item no | Item name | Heritage significance | Impact description | Mitigation measures |
|---|---|---|---|---|---|
| 2 | 6 | Bridge and culvert, Halfway Creek | Does not meet thresholds | n/a | n/a |
| 2 | 7 | Service station, Halfway Creek | Local | Direct impact on curtilage - destruction of subsurface archaeological deposits.<br><br>Indirect impact on structures - physical damage due to vibration and/or contact with road construction materials.<br><br>Architectural noise treatment. | Salvage archaeological excavation.<br><br>Barrier fencing, dust control, dilapidation survey.<br><br>Heritage advice on selection of specific noise controls. |
| 2 | 8 | Survey mark, Halfway Creek | Does not meet thresholds | n/a | n/a |
| 2 | 9 | Bridge at Wells Crossing | Does not meet thresholds | n/a | n/a |
| 2 | 35 | Six Mile Tick Gate Remains, Glenugie | Local | Destruction of physical remains of site due to construction. | Archival photographic recording already undertaken; no further measures. |
| 2 | 36 | North Coast Railway Branch Tramway, Glenugie | Local | Destruction of small section of physical remains of site due to construction. | Archival photographic recording. |
| 3 | 11 | Tyndale Residence, Tyndale | Local | Visual, physical damage to property landscaping. Architectural noise treatment. | Arborist recording of trees, barrier fencing. Heritage advice on selection of specific noise controls. |
| 4 | 10 | Tyndale Shed and Cane Barracks, Tyndale | Local | Not impacted. | n/a |
| 4 | 12 | Maclean Punt and former Ashby ferry, Maclean | Local | Obscured view from roadside, physical damage due to vibration and/or contact with road construction materials. | Clear directional signage for visitors, barrier fencing, dust control, dilapidation survey. |

| Project section | Item no | Item name | Heritage significance | Impact description | Mitigation measures |
|---|---|---|---|---|---|
| 4 | 22 | Former house site, Goodwood Street, Maclean | Does not meet thresholds | n/a | n/a |
| 4 | 34 | Townsend Residence, Townsend | Local | Architectural noise treatment. | Heritage advice on selection of specific noise controls. |
| 5 | 13 | 'Highfield' Residence, James Creek | Local | Not impacted. | n/a |
| 5 | 14 | James Creek Residence, James Creek | Local | Not impacted. | n/a |
| 5 | 15 | Harwood School Residence, Harwood | Local | Not impacted. | n/a |
| 5 | 16 | Harwood School, Harwood | Local | Not impacted. | n/a |
| 5 | 17 | Harwood Tram Tracks, Harwood | Local | Physical damage due to construction traffic on Petticoat Lane Tram Tracks section. | Protective covering. |
| 5 | 18 | Harwood Water Brigade Hall, Harwood | Local | Not impacted. | n/a |
| 5 | 19 | Harwood War Memorial, Harwood | Local | Not impacted. | n/a |
| 5 | 20 | Harwood Bridge, Harwood | Local | Visual. | Design to NSW Roads and Maritime Services' *Bridge Aesthetics* guidelines. |
| 5 | 21 | Convent, 12 River St, Harwood | Local | Entire site demolished. | Archival photographic recording, relocation of building. |
| 5 | 32 | Harwood Heritage Conservation Area | Local | Demolition of structures within Heritage Conservation Area. | Archival photographic recording (Item 21 Convent). |
| 5 | 37 | River Street Trees, Harwood | Local | Not impacted. | n/a |
| 7 | 23 | New Italy Settlement Landscape | State | Indirect impact on State Heritage Register curtilage - physical damage due to vibration and/or contact with road construction materials; reduction in | Barrier fencing, dust control, dilapidation survey, clear directional signage. |

| Project section | Item no | Item name | Heritage significance | Impact description | Mitigation measures |
|---|---|---|---|---|---|
| | | | | visitor numbers due to removal of direct access.<br><br>Direct impact on Local Environmental Plan curtilage including Memorial and Stone-lined Well and Roder's Well and Mango Trees - demolition. | Relocation of Memorial<br>Barrier fencing, dust control, dilapidation survey.<br>Salvage archaeological excavation of Roder's Well, archival photographic recording of mango orchard. |
| 7 | 24 | Vineyard Haven, New Italy Settlement | State | Not impacted. | n/a |
| 8 | 25 | Woodburn Slaughterhouse, Trustrums Hill | Local | Not impacted. | n/a |
| 9 | 26 | Maloney Property, Broadwater | Local | Buttery/creamery and dairy demolished.<br><br>Architectural noise treatment for homestead. | Archival photographic recording.<br><br>Heritage advice on selection of specific noise controls. |
| 9 | 38 | Cemetery Reserve, Broadwater | Local | Potential ground disturbance of subsurface features. | Mechanical excavator scrape of ground to determine presence or absence of graves in impact area, barrier fencing along reserve boundaries during construction. |
| 9 | 28 | Byrne Property features, Broadwater | Local | Destruction of some subsurface archaeological deposits and features.<br>Indirect impact on brick-lined well - physical damage due to vibration and/or contact with road construction materials. | Archaeological salvage excavation of specified features, archival photographic recording of specific features.<br>Detailed vibration assessment on brick-lined well; appropriate measures based on assessment.<br>Barrier fencing, dust control, dilapidation survey, secure loose components on brick-lined well during construction.<br>Permanent fencing of brick-lined well following construction. |

| Project section | Item no | Item name | Heritage significance | Impact description | Mitigation measures |
|---|---|---|---|---|---|
| 10 | 27 | Meerschaum Vale Brickworks, Wardell | Local | Potential for destruction of subsurface archaeological deposits and features. | Procedure for discovery of historical heritage materials, features or deposits. |
| 10 | 29 | Stonehenge Property, Wardell | Local | Demolition of main residence, and part of drainage system.<br>Architectural noise treatment for 1940s residence. | Archival photographic recording, detailed survey of drainage system.<br>Heritage advice on selection of specific noise controls. |
| 10 | 30 | Bamboo stands, Properties 723 and 725, Wardell | Local | Not impacted. | n/a |
| 10 | 31 | Potential house site, Wardell | Does not meet thresholds | n/a | n/a |
| Multiple | 33 | High Conservation Value Old Growth Forest | State | Clearing of trees. | Impact minimised through road design. |

# 1. Introduction

## 1.1. Overview

NSW Roads and Maritime Services (RMS) is seeking project approval for the Woolgoolga to Ballina Pacific Highway upgrade project (the project) which is located on the NSW North Coast. The approval is sought under Part 5.1 of the *Environmental Planning and Assessment Act 1979* (EP&A Act). This report forms an input into the environmental impact statement prepared for the Woolgoolga to Ballina Pacific Highway upgrade.

## 1.2. Project description

The project would upgrade around 155 kilometres of highway, forming a major part of the overall Pacific Highway Upgrade Program. The project would provide a four-lane divided carriageway from around five kilometres north of Woolgoolga to around six kilometres south of Ballina.

The project has been divided into eleven sections between tie-ins with the existing Pacific Highway to aid description, and the impact assessment for the project is described for each of these sections (refer to Table 1-1).

**Table 1-1 Project sections and lengths**

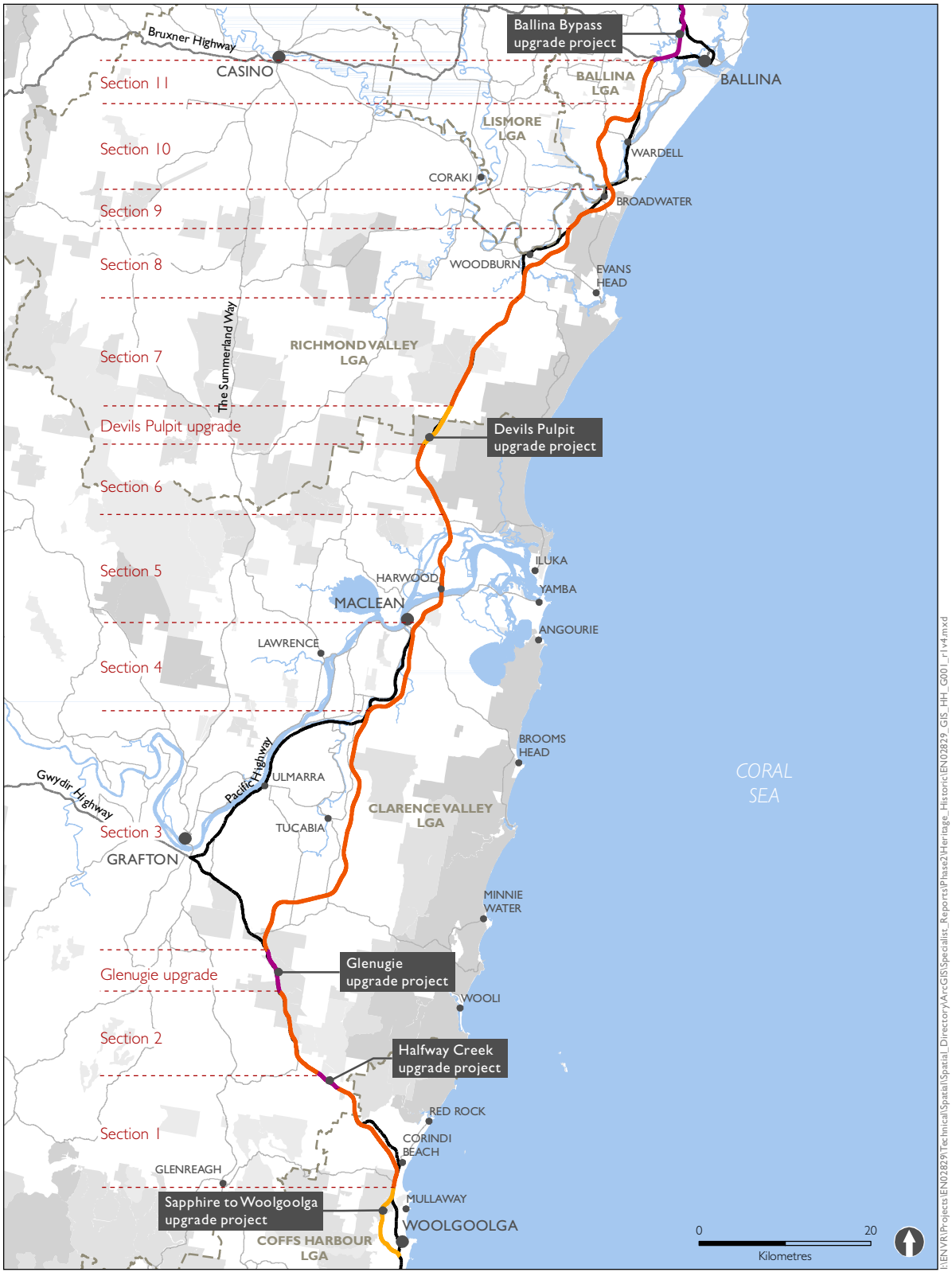
| Project section | Location | Station | | Length (kilometres) |
|---|---|---|---|---|
| | | Start | Finish | |
| 1 | Woolgoolga to Halfway Creek | 0 | 17.0 | 17.0 |
| 2 | Halfway Creek to Glenugie upgrade | 17.0 | 28.7 | 11.7 |
| 3 | Glenugie upgrade to Tyndale | 33.8 | 68.8 | 35.0 |
| 4 | Tyndale to Maclean | 68.8 | 82.0 | 13.2 |
| 5 | Maclean to Iluka Road, Mororo | 82.0 | 96.4 | 14.4 |
| 6 | Iluka Road to Devil's Pulpit upgrade | 96.4 | 105.6 | 9.2 |
| 7 | Devil's Pulpit upgrade to Trustums Hill | 111.1 | 126.4 | 15.3 |
| 8 | Trustums Hill to Broadwater National Park | 126.4 | 137.6 | 11.2 |
| 9 | Broadwater National Park to Richmond River | 137.6 | 145.1 | 7.5 |
| 10 | Richmond River to Coolgardie Road | 145.1 | 158.6 | 13.5 |
| 11 | Coolgardie Road to Ballina bypass | 158.6 | 164.0 | 5.4 |

Figure 1-1 shows an overview of the project and the project sections.

The key features of the project include:

- Around 155 kilometres of motorway standard highway, comprising a four-lane divided carriageway (two lanes in each direction) that can be upgraded to a six-lane divided carriageway in the future, if required
- Bypasses of Grafton, South Grafton, Ulmarra, Woodburn, Broadwater and Wardell
- Ten interchanges to provide access to and from the upgraded highway at:
    - Range Road (Corindi)
    - Glenugie (Eight Mile Lane)
    - Tyndale (Sheey's Lane)
    - Maclean (Goodwood Street)
    - Yamba Road (Harwood)
    - Watts Lane (Harwood)
    - Iluka Road (Woombah)
    - Woodburn (Trustums Hill Road)
    - Broadwater (Evans Head Road)
    - Wardell (Coolgardie Road)
- About 40 bridge crossings of waterways or floodplains, including bridges over the Clarence and Richmond rivers
- About 55 overbridge and underpasses structures to maintain access along local roads crossed by the project
- Viaducts located where the project would cross low-lying or flood-prone areas
- Service roads and access roads to maintain connections to existing local roads and properties
- Structures to help wildlife cross above or below the project including crossings for tree-dwelling mammals, dedicated culverts under the highway and over-land fauna bridges
- Rest areas located at around 50 kilometre intervals for both northbound and southbound traffic. These are located at:
    - Tucabia (north and southbound)
    - North of Mororo Road (southbound)
    - South of Old Bagotville Road (north and southbound)
    - Heavy vehicle inspection station located near Halfway Creek.

Figure 1-1 Project overview




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

In addition to these key features, the project would include construction sedimentation basins, operational water quality basins and construction facilities such as compounds and batching plants.

Construction would be staged from 2013 onwards following project approval, depending on the availability of funding. Construction of the project would generally comprise the conventional techniques employed on most major highway projects, modified for specific environmental or engineering constraints. RMS seeks approval for construction working hours for all day (8am–5pm) on Saturdays and between 6am and 7pm on weekdays.

An indicative outline of construction activities may include:

- Establishment of the construction site and ancillary facilities
- Enabling works, including adjustments to utilities, property adjustments, works to existing drainage and provision of construction access roads
- Clearing and grubbing of vegetation, stripping of topsoil and stockpiling for re-use
- Construction of road cuttings and embankments
- Treating areas of soft soil to stabilise the underlying soil sub-layers
- Installing drainage and bridging structures
- Laying of pavement materials
- Installing pavement markings, signposting, street lighting and progressive landscaping.

The project would not be built in one phase. The project would be delivered in stages as further funding becomes available and to best manage construction and material resources. Stages would be identified that prioritise and target upgrades and works that would best deliver safety and traffic efficiency improvements, and best deliver value for money outcomes.

This working paper assesses the potential impacts of the full motorway standard upgrade for construction and operation. Where there are relevant differences between the full motorway standard upgrade and the initial upgrade to arterial standard, those impacts are also assessed. Impacts are generally identified through the eleven project sections identified above.

Further information on the description of the project and the assessment of other environmental aspects can be found in the main volume of the environmental impact statement.

While the project is for a four-lane motorway standard upgrade, the construction and opening of the project would be staged. Staging could include some sections being constructed and opened initially as a four-lane arterial standard upgrade.

The project does not include the Pacific Highway upgrades at Glenugie and Devils Pulpit, which are located between Woolgoolga and Ballina, as Glenugie is now complete and Devils Pulpit is under construction. Together with the Glenugie and Devils Pulpit upgrades, the project would complete a total of 164 kilometres of upgraded highway between Woolgoolga and Ballina.

### 1.2.1. 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
- Woodburn to Ballina.

The route development process for the previous development projects 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 NSW Roads and Maritime Services website www.pacifichighwayupgrade.com.au (click on Woolgoolga to Ballina).

### 1.2.2. Study area

The area subject to this heritage assessment includes the entire extent of the project boundary for the Pacific Highway Woolgoolga to Ballina upgrade and the ancillary sites for the project. The thematic history and predictive model by their nature cover the broader region surrounding the project boundary.

The project boundary (of around 155 kilometres) is generally 100 metres wide with the corridor being wider at interchanges and in areas of large cuts and fills. The historical heritage assessment presented in this report includes a buffer of around 50 metres on either side of the project boundary. This buffer allows for assessment of indirect impacts on historical heritage items which are not within the directly affected project boundary.

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 project boundary. The study area encompasses the project boundary and any peripheral land areas where indirect impacts may occur.

The future construction and delivery of the project would be staged 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 identified in Table 1-1 and shown in Figure 1-2 to Figure 1-6. 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 Figure 1-2 to Figure 1-6.

Figure 1-2 The project alignment - Arrawarra to Glenugie

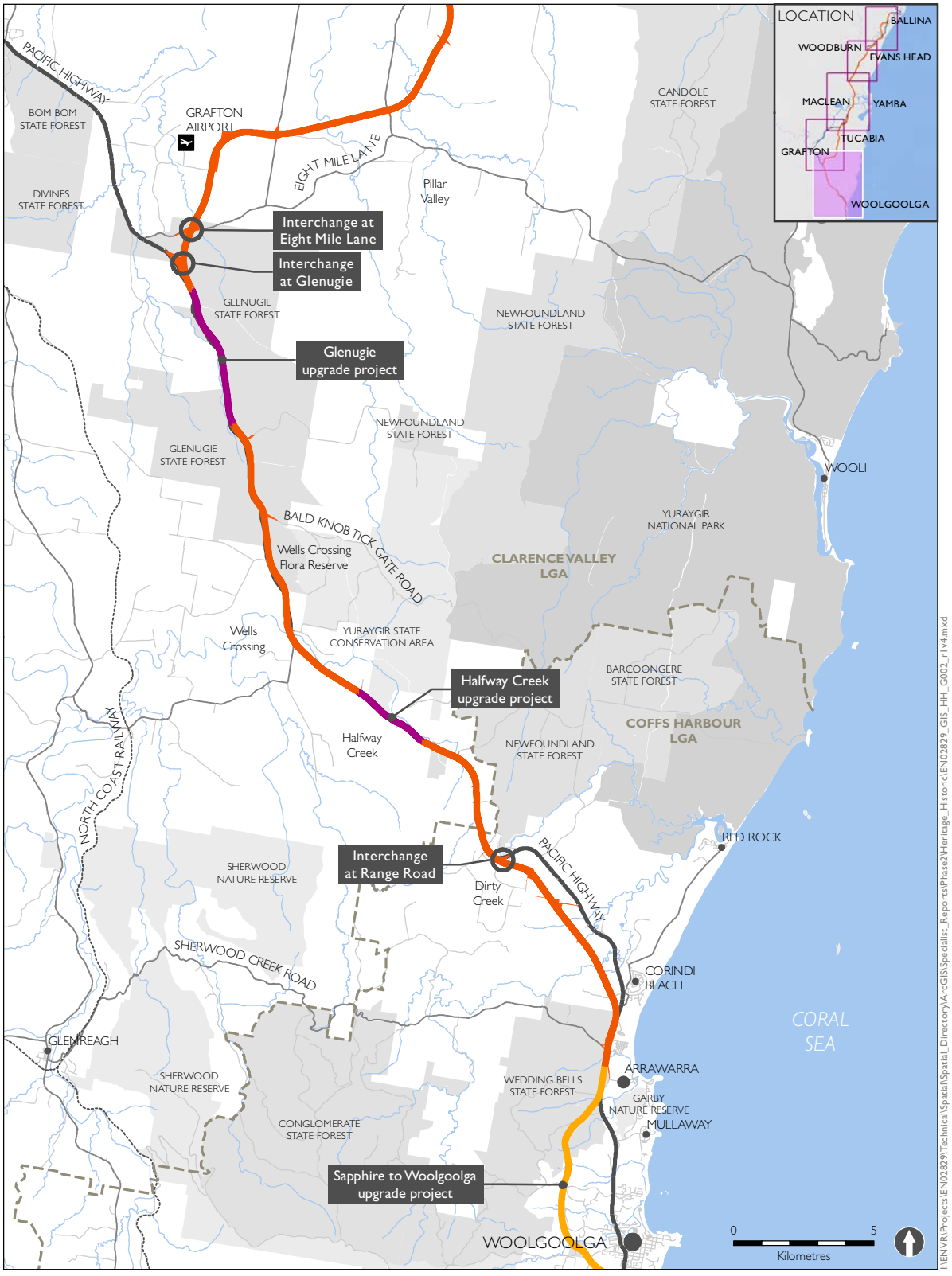
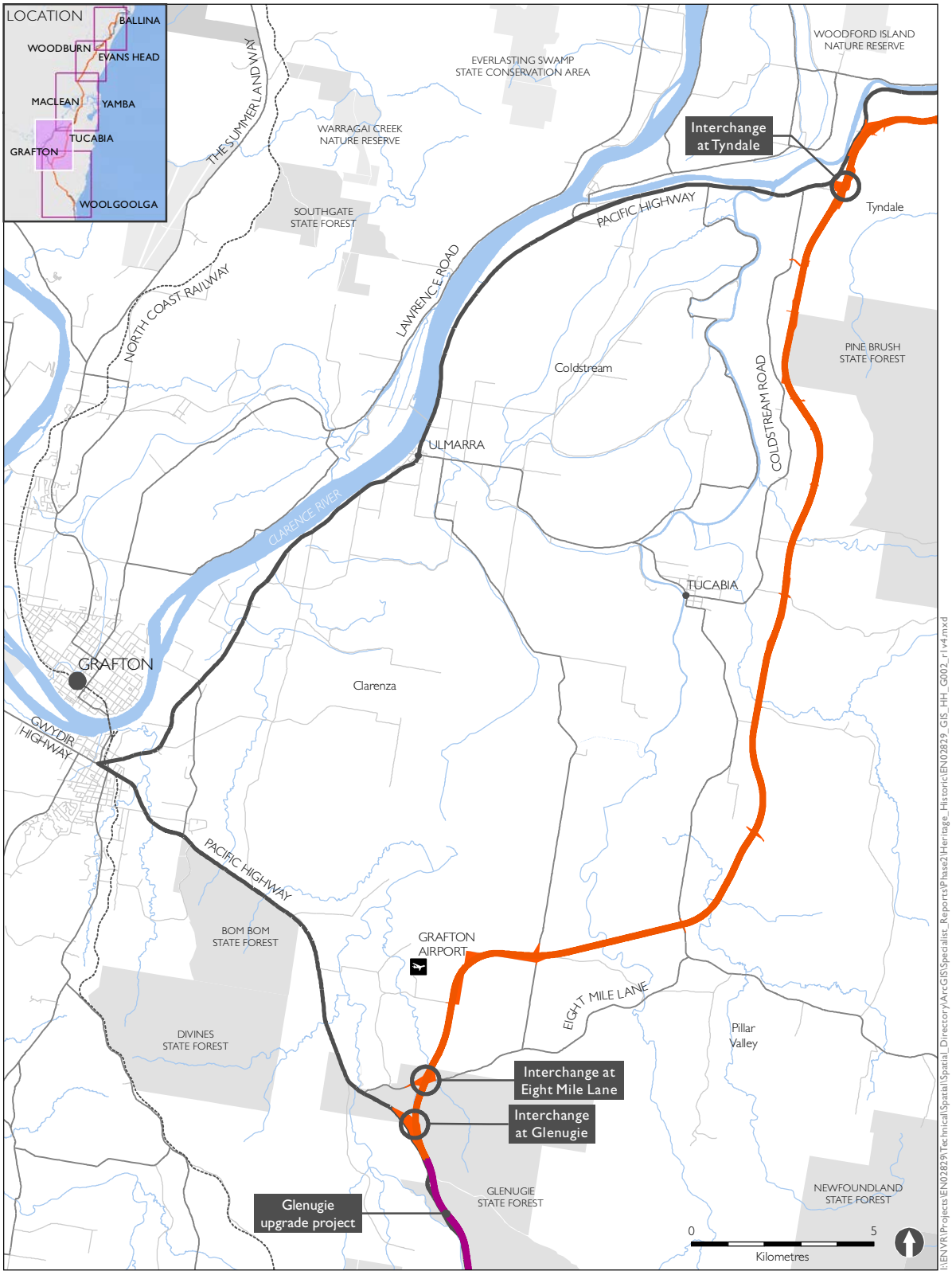
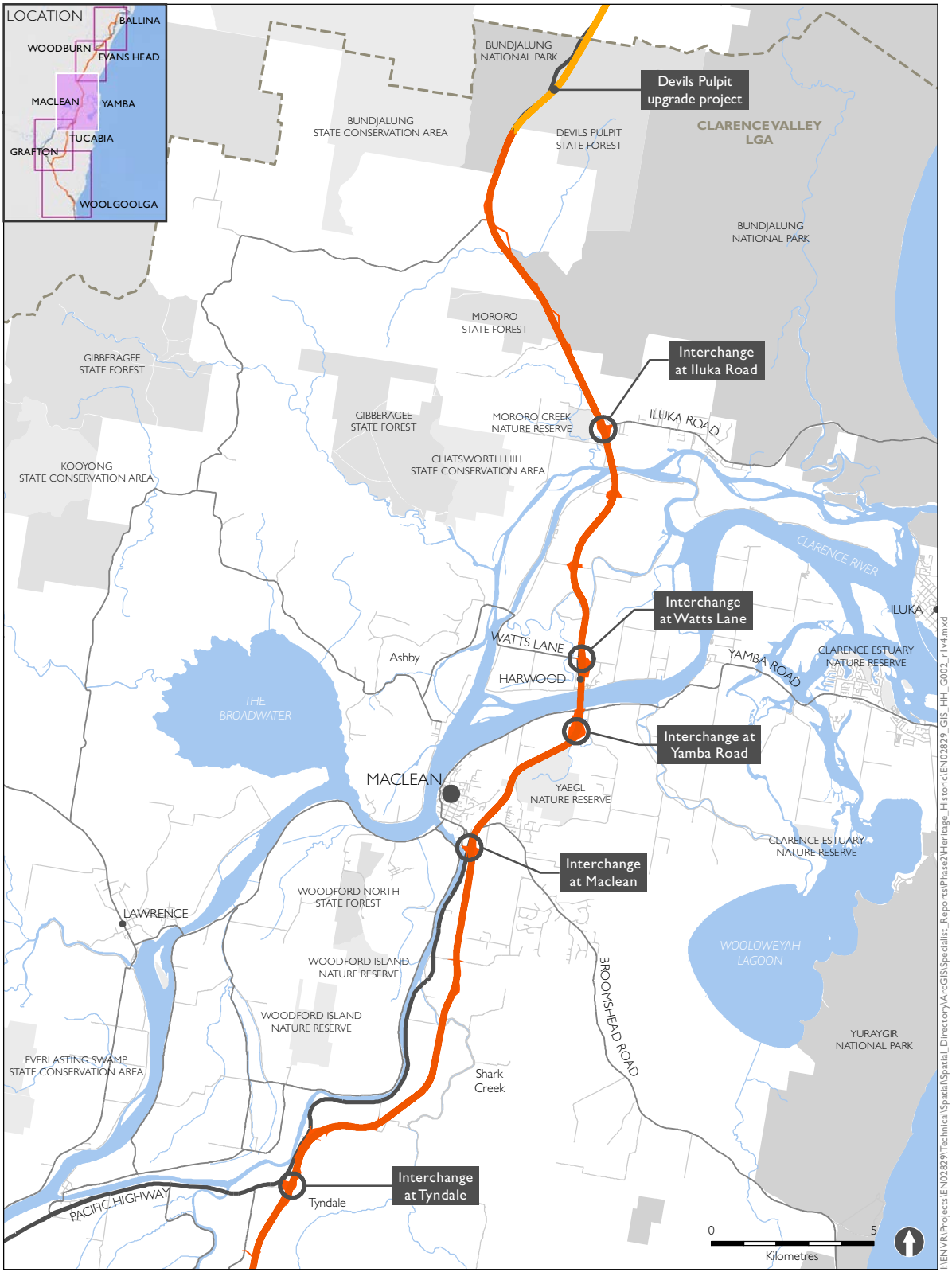


Figure 1-3 The project alignment - Glenugie to Tyndale



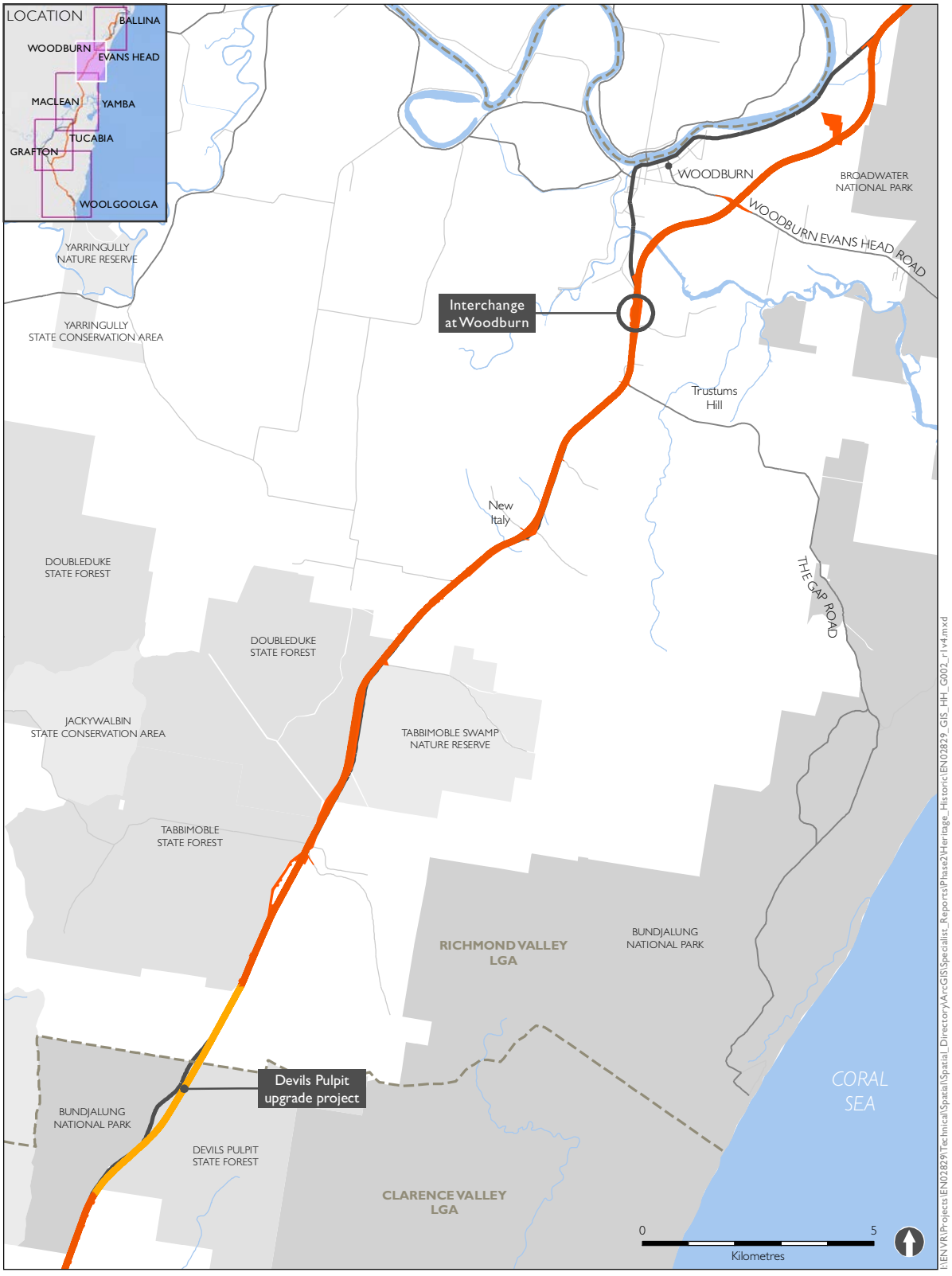

The project
Upgrade completed to dual carriageway
Upgrade under construction
Existing Pacific Highway

Figure 1-4 The project alignment - Tyndale to Devils Pulpit



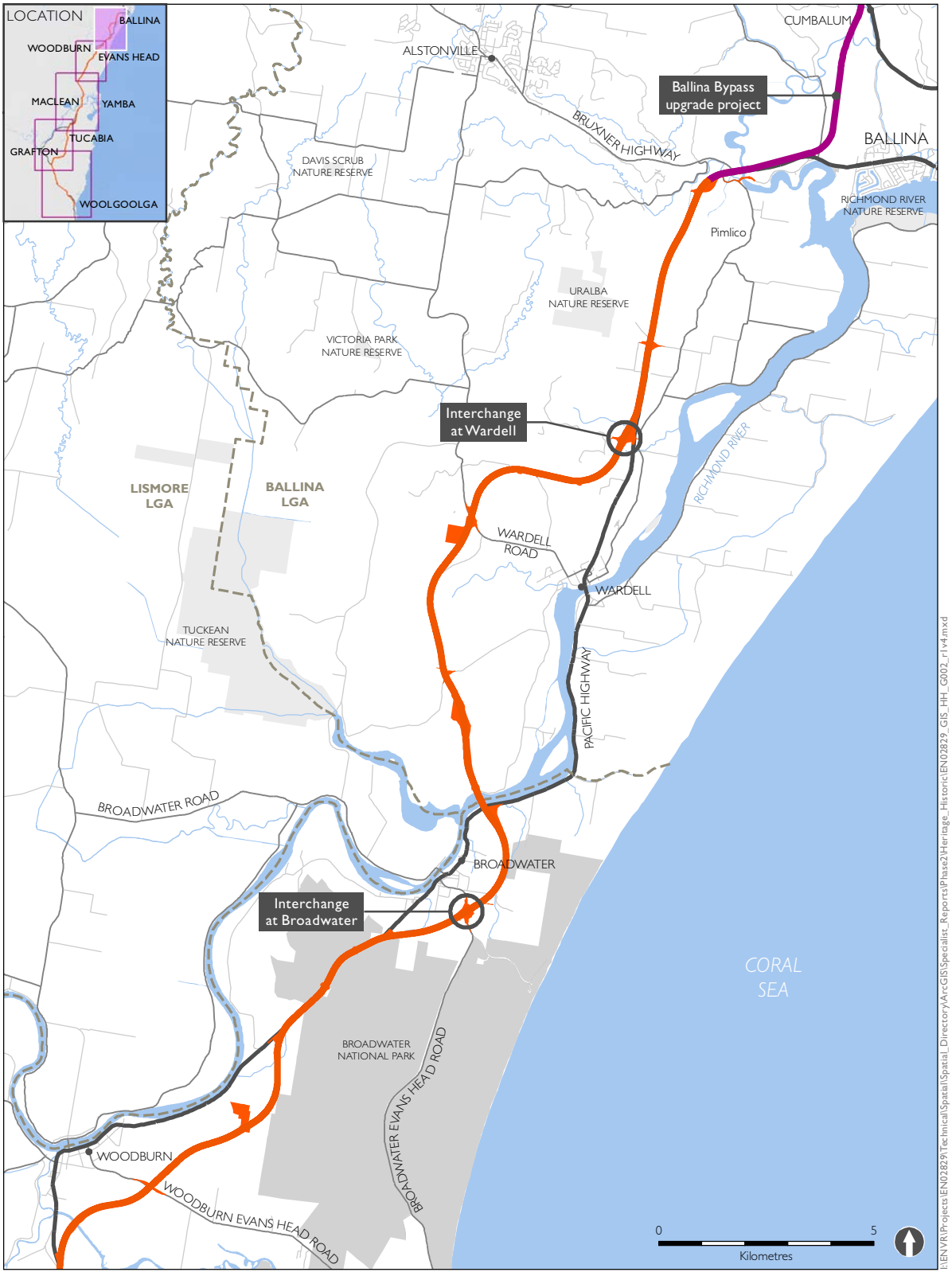

The project
Upgrade completed to dual carriageway
Upgrade under construction
Existing Pacific Highway

Figure 1-5 The project alignment - Devils Pulpit to Woodburn




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

Figure 1-6 The project alignment - Woodburn to Ballina




The project
Upgrade completed to dual carriageway
Upgrade under construction
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## 1.3. Study objectives and requirements

### 1.3.1. Objectives

The objectives of this non-Aboriginal historical heritage technical paper are to:

- Undertake a non-Aboriginal historical heritage assessment in accordance with relevant heritage guidelines
- Addresses the Director-General's environmental assessment requirements.

### 1.3.2. Assessment requirements

This assessment addresses the Director-General's environmental assessment requirements for the project for non-Aboriginal historical heritage. Comments on and recommendations about the Director-General's environmental assessment requirements from the Heritage Council of NSW were also addressed in the assessment. Table 1-2 details the requirements and where these are addressed within this report.

**Table 1-2: Director-General's environmental assessment requirements for non-Aboriginal historical heritage.**

| Requirements | Where addressed in report? |
|---|---|
| Impacts to *State and local historical heritage* (including archaeology, heritage items, conservation areas and natural areas), in particular: | Chapter 5 – Impact assessment |
| Impacts to the New Italy Settlement and | Section 5.4.8 – New Italy Settlement Landscape statement of heritage impact |
| High Conservation Value Old Growth Forest should be assessed. | Section 5.4.13 – High Conservation Value Old Growth Forest statement of heritage impact |
| 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). | Section 5.4 – Statements of heritage impact<br>Chapter 6 – Mitigation and management |
| 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). | Table 2-1<br>Chapter 2 - Assessment methodology |
| Include a statement of heritage impact for all heritage items (including significance assessment) | Section 5.4 – Statements of heritage impact<br>Appendix A – Site descriptions and significance assessments |

| Requirements | Where addressed in report? |
|---|---|
| Consider impacts from vibration, demolition, archaeological disturbance, altered historical arrangements and access, landscape and vistas, and architectural noise treatment. | Section 5.4 – Statements of heritage impact |
| Develop an appropriate archaeological assessment methodology, including research design, to guide physical archaeological test excavations and include the results of these excavations. | Section 5.4 - Statements of heritage impact. Preparation of the statements of heritage impact have determined that no test excavations of the impacted heritage items are required. |

# 2. Assessment methodology

This chapter details the methods used in completing the non-Aboriginal historical heritage assessment. An outline of the assessment approach is provided. Details of previous and current field surveys and the survey coverage of the project boundary are presented. The chapter also presents the approach taken in assessing the heritage significance of heritage items, the approach taken to the project's non-Aboriginal environmental impact assessment, consultation undertaken and the relevant guidelines and legislation used in undertaking the assessment.

The overall approach to the assessment comprised identifying heritage items[1] within and adjacent to the project boundary through a review of previous heritage studies, searches of relevant heritage register and schedules, and by undertaking field survey. The significance of each heritage item was assessed in accordance with NSW Heritage Office (2001) guidelines. The impact of the project on each heritage item was then assessed, both for direct and indirect impacts including impacts from vibration, demolition, archaeological disturbance, altered historical arrangements and access, landscape and vistas, and architectural noise treatment. Statements of heritage impact were prepared in accordance with NSW Heritage Office (1996b) guidelines for each heritage item where impacts would occur. Appropriate management measures were identified to avoid, minimise and manage impacts to each heritage item. The assessment was undertaken by a team of suitably qualified heritage consultants under the direction of Dr Karen Murphy (Senior Historical Archaeologist, SKM) and Vanessa Edmonds (Practice Leader - Cultural Heritage Assessments, SKM) (Table 2-1).

## 2.1. Assessment approach

### 2.1.1. Overall approach

The detailed steps of the assessment approach are as follows:

- Review relevant heritage legislation
- Review background information including previous thematic histories, field surveys and assessments undertaken during the four previous development projects

[1] The term 'heritage item' is used throughout this report to indicate any non-Aboriginal historical heritage place including buildings, structures, and archaeological remains. Each heritage item is individually numbered but may include either a single component or multiple components making up a broader complex with direct historical and cultural associations.

(Woolgoolga to Wells Crossing, Wells Crossing to Iluka Road, Iluka Road to Woodburn and Woodburn to Ballina)

- Search all available historical heritage registers for the project boundary, including the State Heritage Register, State Heritage Inventory, NSW Roads and Maritime Services Section 170 Heritage and Conservation Register, Local environmental plans, National Trust of Australia (NSW) list, Register of the National Estate, Commonwealth Heritage List, National Heritage List, National Shipwrecks Database and World Heritage List
- Collate any known heritage curtilage (boundary) information as part of the heritage searches
- Undertake a literature review including previous archaeological reports, historical heritage studies, local heritage studies, conservation management plans, as well as regional and local history documents and maps where available
- Prepare thematic history
- Develop a predictive model for occurrence of historical site types in the landscape and apply this to the study area to inform further field survey requirements
- Undertake field survey of the project boundary (in areas not covered by previous surveys) to identify known historical heritage items, unrecorded historical heritage items and assess the potential for any unrecorded historical heritage items
- Undertake desktop assessment of ancillary sites to identify known historical heritage items and assess potential for any unrecorded historical heritage items
- Provide a list of historical heritage items and features located within or adjacent to the project boundary
- Consult with authors of previous studies, if necessary, to gather further information
- Undertake additional consultation with relevant councils and the Heritage Branch of the Office of Environment and Heritage, regarding heritage significance and curtilage of heritage-listed items
- Undertake targeted survey to record identified historical heritage items and determine heritage curtilages
- Prepare statements of heritage impact (including assessments of significance) for all historical heritage items impacted by the project
- Undertake assessment of cumulative impacts on non-Aboriginal historical heritage (including cultural landscapes and previous and existing highway infrastructure)
- Recommend management and mitigation measures.

Further information on heritage register searches, predictive modelling, approach to the survey, assessments of significance and consultation is identified in detail below.

**Table 2-1: Heritage consultants undertaking this assessment.**

| Name | Qualifications | Role |
|---|---|---|
| Dr Karen Murphy | PhD (Historical Archaeology)<br>Bachelor of Arts (Honours) (Archaeology) | Management and direction of overall assessment<br>Field survey<br>Historical research<br>Significance assessment<br>Statements of Heritage Impact<br>Writing and preparation of report |
| Vanessa Edmonds | Bachelor of Arts (Australian Prehistory)<br>Master of Letters (Archaeology and Palaeo-anthropology) | Advice and guidance on overall assessment<br>Field survey |
| Rose Reid | Bachelor of Arts (Archaeology/ Anthropology)<br>Bachelor of Science (Honours) (Geology) | Historical research<br>Register searches<br>Review of previous assessment<br>Writing and preparation of report |
| Rachael Loizou | Bachelor of Arts (Honours) (Archaeology) | Field survey<br>Historical research<br>Significance assessment<br>Statements of Heritage Impact |
| Joseph Brooke | Bachelor of Archaeology (Honours) | Field survey |
| Robyn Jenkins | Bachelor of Social Science (Honours) (Archaeology) | Field survey |
| Andrew Costello | Bachelor of Arts (Honours) (Archaeology) | Field survey |
| Rani Attwood | Bachelor of Archaeology<br>Graduate Diploma of Archaeology | Field survey |
| Erica Weston | Bachelor of Arts (Archaeology) | Field survey |

### 2.1.2. Approach to heritage values of the Pacific Highway

The heritage values of the Pacific Highway itself were also examined as part of this assessment. The heritage assessment of the Pacific Highway as an item of heritage has not been comprehensively undertaken as part of any previous Pacific Highway upgrade projects in NSW. In the few instances where previous heritage assessments did examine components of the Pacific Highway for their heritage values these undertook significance assessments of the individual remnants or components of the Pacific Highway and usually found these to not meet threshold criteria for either local or State significance. Alternatively, in one instance, the Pacific Highway was referred to as a 'highly significant State road' but provided no supporting evidence or assessment for this statement.

To address this deficiency, this assessment examines the Pacific Highway from a heritage perspective. Rather than using the overall approach outlined above for other heritage items, a more broad, landscape type approach has been undertaken due the extensive nature of the highway as a place and the huge number and variety of components that it comprises. The assessment

presents the historical background of the highway, the known physical remains and former routes of the highway, a significance assessment of the Highway as a whole, and the impacts of the project on the highway overall.

## 2.2. Historical heritage register searches

This assessment of historical heritage included searches of all heritage registers to identify items located in or near the project boundary. Heritage registers and schedules searched included:

- The Australian Heritage Database (including the World Heritage List, the Register of the National Estate, the Commonwealth Heritage List and the National Heritage List)
- The National Shipwrecks Database
- The State Heritage Register
- The State Heritage Inventory
- Heritage Schedules in local environmental plans including Ballina Local Environmental Plan (1987), Coffs Harbour City Council Local Environmental Plan (2000), draft Ballina Local Environmental Plan (2010), Clarence Valley Local Environmental Plan (2011) and Richmond Valley Local Environmental Plan (2012)
- The National Trust (NSW) list
- The Roads and Maritime Services Heritage and Conservation Register (under Section 170 of the *Heritage Act 1977*)
- All registers and schedules were initially searched in July-August 2010 to inform the predictive model and early field survey. The registers were again searched in November-December 2011 to ensure any changes to registered items was captured. As draft Local environmental plans were gazetted the heritage schedules were again searched in December 2011 (Clarence Valley) and February 2012 (Richmond Valley).

Heritage studies and anecdotal information about registered sites have been sourced from:

- Ballina Shire, Richmond Valley, Clarence Valley and Coffs Harbour City Councils
- Historical societies including Richmond River Historical Society, Coffs Harbour Local Historical Society, Mid-Richmond Historical Society and Clarence River Historical Society
- The New Italy Museum, New Italy.

## 2.3. Predictive model

The predictive model was developed to identify the most likely types of historical heritage sites to be found in the project area and areas of greater or lesser potential for the presence of historical heritage sites. The predictive model was then used to inform further requirements for field survey.

The model was developed as follows:

- Review of previous predictive models and statements made for the region in previous heritage assessments and investigations
- Identification of known and recorded historical heritage sites from heritage registers and databases and previous heritage investigations
- Review of previous literature including primary documents, local histories and historical maps regarding the history of the region
- Identification of key historical themes for the region based on the historical activities undertaken
- Development of a thematic history for the region based on the identified historical themes including key dates, activities and the pattern of historical development up to the present day
- Consideration of information about current landscape and land use to assist in identification of likely presence and/or survival of particular types of historical heritage sites
- Development of predictive statements for each of the project sections

## 2.4. Field survey

Information from the initial field surveys undertaken for the previous development projects was used to inform the strategy developed for further field survey required.

### 2.4.1. Initial field surveys

Initial field survey has been undertaken in and adjacent to the project boundary as part of the previous development projects. Table 2-2 summarises the locations of the project sections for the current assessment in relation to the previous development projects. The methodology of the initial field surveys is provided below. The initial field survey results are provided in section 3.2.2.

South East Archaeology (Kuskie and Carter 2007) undertook heritage survey of the previous Woolgoolga to Wells Crossing development project along the preferred route corridor at an average width of 150 metres and with several minor areas outside the corridor for access roads and other ancillary works. Based on an initial predictive study undertaken by South East Archaeology in 2005 for identifying feasible route options, a comprehensive survey of almost the entire preferred corridor was undertaken by South East Archaeology in March 2005. The survey

sampled coverage of the entire preferred route corridor except for areas of totally modified ground and several small areas where property access was not available. That survey covered around 90 per cent of the preferred route corridor. Non-Aboriginal heritage items which were identified during the survey were recorded in detail by an historical archaeologist in May 2007.

Navin Officer (2009b) surveyed the previous Wells Crossing to Iluka Road development project (excluding the alignment between Tyndale and Maclean) along the preferred route corridor at a nominal 150 metre width. A general predictive statement about the types of heritage items likely to be found in the preferred route corridor was developed. The survey involved the inspection of heritage sites identified on registers/lists, from local community consultation, topographic maps and through windscreen survey driving along the existing highway and secondary road in the preferred route corridor, as well as pedestrian survey to identify any further sites. The survey was undertaken in November-December 2007 and covered around 90.5 per cent of the preferred route corridor. The remaining 9.5 per cent was assessed by desktop analysis.

Connell Wagner (2008) undertook a study for the previous Iluka Road to Woodburn development project along the preferred route corridor up to one kilometre either side of the existing highway alignment. They undertook consultation with local councils, historical societies and other community members and groups to identify heritage sites. They also identified sites from register searches and from previous heritage studies. Site inspections were made of identified heritage sites, but no broad scale survey for unknown sites was carried out.

Heritage Concepts (2005) undertook a study for the Woodburn to Ballina development project, investigating all proposed corridor options. The survey of the corridor options included ground-truthing known heritage sites identified from registers/lists, and by sampling different land use zones to provide optimum survey coverage. Areas selected for survey represented different land use zones along the proposed routes with a focus on riverine, built and rural environments. Along what was to become the preferred route corridor Heritage Concepts undertook visual inspection but only limited detailed survey due to issues with property access.

The field survey coverage and quality as a result of the previous development projects varied between the projects. The field surveys for the Woolgoolga to Wells Crossing and Wells Crossing to Iluka Road development projects comprised comprehensive field survey coverage. The Iluka Road to Woodburn investigations focused on known historical heritage items with a limited field survey program. The investigation for the Woodburn to Ballina development project provided a comprehensive assessment of potential heritage items even where direct access to properties was limited. A review of the previous survey undertaken informed the more recent field survey program as part of the current development program. Overall the methodology and coverage of the initial field survey programs was sufficient, and as such the more recent field survey program focused on areas not previously surveyed.

**Table 2-2: Summary of project sections in relation to the previous development projects.**

| Project section | Location | Previous development project | Field survey (survey team, date) |
|---|---|---|---|
| 1 | Woolgoolga to Halfway Creek | Woolgoolga to Wells Crossing | South East Archaeology, 2005, 2007<br><br>SKM, 2010-2011 |
| 2 | Halfway Creek to Glenugie upgrade | Woolgoolga to Wells Crossing | South East Archaeology, 2005, 2007<br><br>SKM, 2010-2011 |
| 3 | Glenugie upgrade to Tyndale | Wells Crossing to Iluka Road | Navin Officer, 2007<br><br>SKM, 2010-2011 |
| 4 | Tyndale to Maclean | Wells Crossing to Iluka Road | SKM, 2010-2011 |
| 5 | Maclean to Iluka Road, Mororo | Wells Crossing to Iluka Road | Navin Officer, 2007<br><br>SKM, 2010-2011 |
| 6 | Iluka Road to Devil's Pulpit upgrade | Iluka Road to Woodburn | Connell Wagner, 2007<br><br>SKM, 2010-2011 |
| 7 | Devil's Pulpit upgrade to Trustums Hill | Iluka Road to Woodburn | Connell Wagner, 2007<br><br>SKM, 2010-2011 |
| 8 | Trustums Hill to Broadwater National Park | Iluka Road to Woodburn<br><br>Woodburn to Ballina | Connell Wagner, 2007<br><br>Heritage Concepts, 2005<br><br>SKM, 2010-2011 |
| 9 | Broadwater National Park to Richmond River | Woodburn to Ballina | Heritage Concepts, 2005<br><br>SKM, 2010-2011 |
| 10 | Richmond River to Coolgardie Road | Woodburn to Ballina | Heritage Concepts, 2005<br><br>SKM, 2010-2011 |
| 11 | Coolgardie Road to Ballina bypass | Woodburn to Ballina | Heritage Concepts, 2005<br><br>SKM, 2010-2011 |

### 2.4.2. Recent field survey

Prior to undertaking more recent field survey, priority areas were identified using background information including topography, the predictive model for historical site types, previous studies and field surveys and historical heritage register listings. This provided a summary of target areas for survey.

The field surveys initially sampled a range of different land use and landforms within the project boundary. There was a focus on riverine, rural and built environments with the aim of maximising coverage in areas considered to be of higher sensitivity. Additionally, ground truthing (visiting and verifying) was undertaken at known heritage sites which could be directly or indirectly impacted by the project.

Completion of the heritage survey of the project boundary was undertaken in four stages:

- An initial field survey was undertaken between 23 and 27 August 2010 (five days). The field team comprised five qualified archaeologists: Vanessa Edmonds, Andrew Costello, Joseph Brooke, Robyn Jenkins and Rani Attwood.
- A second archaeological field survey was undertaken of previously unsurveyed portions of the project boundary between Woodburn and Ballina, as well as several areas elsewhere in the project boundary between 2 and 4 of August 2011 (three days) by Joseph Brooke and Andrew Costello.
- A third archaeological field survey was undertaken of the project boundary to finalise unsurveyed portions between 4 and 7 October 2011 (four days) by Andrew Costello, Joseph Brooke and Erica Weston.
- The fourth stage of field survey targeted the identified historical heritage sites which required detailed assessment between 25 October and 1 November 2011 (six days) by Karen Murphy and Rachael Loizou.

The field surveys were undertaken as follows:

- Survey areas were defined on the basis of landholder information; each block of land with unique property information constituted a survey area. The field survey was undertaken on foot in five metres to 10 metres wide transects across each survey area, with particular attention given to areas of higher ground surface visibility or where the surface was exposed.
- At properties where access was not possible the property was visually assessed from the adjacent property. This method was particularly useful where it could be noted that ground surface visibility was extremely low due to thick scrub or sugar cane plantation and would render pedestrian survey ineffective.
- Where property access was possible, the locations of all historical heritage sites were recorded using a Trimble GeoXT differential Global Positioning System or a Magellan Explorist 600 handheld Global Positioning System.

- 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.
- The survey did not include areas which had been surveyed for the previous development projects, except for specific historical heritage items identified in these previous surveys which required more detailed recording.
- The environmental and archaeological context of each heritage item including general location, site components, landscape features and ground disturbance was recorded in detail and photographed with a digital camera. The curtilage of each historical heritage item was determined and recorded in the field.

Eighty-seven per cent of the overall project boundary has been subject to historical heritage survey through initial and recent field surveys, representing a high proportion of the corridor[2]. The percentage of survey coverage for the project boundary was determined using Geographical Information System coverage data analysis. The main constraints to survey were property access permission and ground-surface exposure (such as agricultural cropping and heavily water-logged properties). The remaining 13 per cent of the project boundary has been assessed using the predictive model described in section 3.3, based on previous site locations, aerial imagery and observations in the field. The effectiveness of the predictive model is examined in section 3.5.

The field survey in October/November 2011 surveyed the majority of previously identified historical heritage items (identified as requiring further assessment); survey coverage for all of the previously identified historical heritage items requiring further assessment is described in Table 2-3. Stonehenge property, Wardell and Townsend residence, Townsend were not surveyed as site access was not granted. These two sites were assessed based on available information from previous heritage studies and current aerial imagery. The High Conservation Value Old Growth Forest was not surveyed due the size and homogenous nature of the entire heritage item and it was able to be assessed through the use of aerial imagery and Geographical Information System analysis. The Service Station Complex, Halfway Creek was not accessible as property access was not granted. Meerschaum Vale Brickworks, Wardell was not surveyed as access and ground surface visibility was hampered by high level grass coverage. These two items were observed from outside the property boundary.

Field survey of ancillary sites situated outside the project boundary would be undertaken where desktop investigations indicate a medium or high level of likelihood of the presence of previously unrecorded or unknown historical heritage sites. The survey would be undertaken during public display of the EIS and results provided in the Submissions report. Section 2.5 details the desktop assessment methodology.

[2] This excludes ancillary sites located outside the project boundary.

**Table 2-3: October/November 2011 survey coverage.**

| Project section | Item name | Survey coverage |
|---|---|---|
| 1 | House, Sheds and Stockyards, Milleara | 100%; interior of structures not surveyed. |
| 2 | Service Station Complex, Halfway Creek | Not surveyed, observed from roadside only as site access was not granted. |
| 4 | Cane Barge, Former Ashby Ferry and Sugarcane Hoist, Maclean | 100% |
| 5 | Harwood Tram Tracks, Harwood | 100% |
| 5 | Harwood Bridge, Harwood | 100% |
| 5 | Convent, Harwood | 100%; interior of structure not surveyed. |
| 7 | New Italy Settlement Landscape, New Italy | 100%; Roder's Stone-lined Well observed from fenceline as site access was not granted. |
| 8 | Woodburn Slaughterhouse, 204 Tuckombil Road, Woodburn | 100% |
| 9 | Maloney Property, Broadwater | Dairy, buttery/creamery and associated open bay/open bay shed were 100% surveyed. Stockyards, residence and remainder of property were observed but not surveyed. |
| 10 | Meerschaum Vale Brickworks, Wardell | Observed proposed location of site from roadside due to OH&S hazards which prevented site access ie very tall grass obscuring uneven ground surface and water channels. |
| 9 | Byrne Property, Broadwater | 100% |
| 10 | 'Stonehenge' Property, Wardell | Not surveyed as site access was not granted. |
| 5 | Harwood Heritage Conservation Area | 100% |
| Multiple | High Conservation Value Old Growth Forests | Not surveyed. Assessed using aerial photos and GIS analysis. |
| 4 | Townsend residence, Townsend | Not surveyed as no site access. |

## 2.5. Desktop assessment of ancillary sites

No field survey was undertaken of the ancillary sites located outside the project boundary due to the timing of finalisation of the ancillary site locations. A desktop assessment was undertaken to identify the likelihood of previously unrecorded or unknown historical heritage sites for all ancillary sites. All ancillary sites were assessed, to determine the likelihood of sites, by identifying:

- Whether the ancillary site is outside the project boundary and therefore not already subject to assessment
- Whether there is presence/absence of known historical heritage sites
- Whether obvious historical features are visible in aerial imagery

- What the level of disturbance, cultivation, vegetation and development of area is
- Whether field survey was undertaken within or adjacent to area.

The predictive model was also considered in the assessment of the ancillary sites. Each ancillary site was ranked with low, medium or high likelihood of historical heritage sites based on the above criteria. Requirements for further assessment including field survey were identified and are included in Section 6.1.4 (Management and mitigation measures). The field surveys would occur during public display of the EIS and the results would be provided in the Submissions report.

## 2.6. Assessment of significance

The assessment of cultural heritage significance seeks to develop an understanding as to why a place or item is considered important and what values it has to the community. The concept of cultural heritage significance supports that both tangible and intangible cultural values can be embodied within the fabric of a place or item and associated items. Further, the degree of significance can be determined using standardised processes.

### 2.6.1. Nature of significance

An updated section of the 1996 NSW Heritage Manual (NSW Heritage Office 2001) sets out a detailed process for assessing heritage significance. The manual provides specific criteria for assessing the significance of an item, including guidelines for inclusion and exclusion. The summary of significance assessment below has been prepared with reference to these guidelines.

The NSW Heritage Council has adopted specific criteria for assessment of eligibility for listing on the NSW State Heritage Register, which are included in the *Heritage Act 1977*. The seven criteria upon which the following assessment of significance is based are outlined below:

- Criterion (a) an item is important in the course, or pattern, of NSW cultural or natural history
- Criterion (b) an item has strong or special association with the life or works of a person, or group of persons, of importance in NSW cultural or natural history
- Criterion (c) an item is important in demonstrating aesthetic characteristics and/or a high degree of creative or technical achievement in NSW
- Criterion (d) an item has strong or special association with a particular community or cultural group in NSW for social, cultural or spiritual reasons
- Criterion (e) an item has potential to yield information that would contribute to an understanding of NSW cultural or natural history
- Criterion (f) an item possesses uncommon, rare or endangered aspects of NSW cultural or natural history

- Criterion (g) an item is important in demonstrating the principal characteristics of a class of NSW cultural or natural places or cultural or natural environments.

Each of the above criteria is considered in regard to the history and physical evidence of the heritage items identified. As the criteria of the Australia ICOMOS *Charter for Places of Cultural Significance* (the Burra Charter) Australia ICOMOS 2000) are very similar to the NSW Heritage Manual, they are not considered separately. The level of significance of each item has also been assessed based on *Levels of Heritage Significance* guidelines (NSW Heritage Office 2008) and in accordance with the definitions of local and State heritage significance in section 4A of the NSW *Heritage Act 1977*.

## 2.7. Definition of impacts

The potential impacts of the project on the heritage significance of heritage items has been described using two categories of potential impact, direct and indirect, as defined below:

- Direct impact is defined as physical change occurring to an item or place situated within the project boundary, which results in the significant diminution of the historical heritage values of that item or place. For the purposes of this analysis, direct impact is considered to be a likely consequence for any site or place situated within the project boundary. Direct impact may include minor and peripheral changes, or large scale removal and destruction
- Indirect impact is defined as an impact to an item or place, or to its surroundings (where those surrounds contribute significantly to the historical heritage values of that item or place), where this occurs outside of the project boundary, and this impact is a consequence of the project. The potential for indirect impact varies according to the nature of the item or place, and its proximity to the project boundary. Indirect impact may include vibration, impacts to landscapes and vistas, changes to ongoing use, change to access or changed associations. Assessments of indirect impact must relate to site-specific characteristics and it is difficult to generalise about a consistent zone of indirect impact surrounding a project boundary.

## 2.8. Consultation informing this assessment

As part of the assessment, consultation was undertaken with a number of different stakeholders as detailed in Table 2-4. Overall project community information sessions and consultation was also undertaken throughout the project. This included consultation with communities in New Italy and Harwood.

**Table 2-4: Consultation informing the non-Aboriginal historical heritage assessment**

| Stakeholder | Objective | Date |
|---|---|---|
| Heritage Branch of the Office of Environment and Heritage | Obtaining State Heritage Register site data, curtilage data and information. | September 2010, January 2011 |
| | Discussion regarding heritage-listed New Italy Settlement Sites. | Meeting request to Bill Nethery, February 2012; postponed twice by Heritage Branch and not rescheduled |
| | Discussion regarding state heritage-listed New Italy Settlement Sites and High Conservation Value Old Growth Forests. | Meeting request with copy of draft working paper provided to Conservation Team, 5 April 2012; no response<br><br>Ongoing follow-up mid-April to mid-May to Vince Sicari; no response<br><br>Updated copy of working paper including images and maps posted to Heritage Branch 1 June 2012. |
| | Briefing regarding heritage issues related to project to Bill Nethery. | 7 June 2012 |
| | Discussion regarding state heritage-listed New Italy Settlement Sites and High Conservation Value Old Growth Forests. | Meeting request to head of Conservation Team, August 2012; declined by Vince Sicari due to workload. |
| | Discussion regarding impacted State Heritage Register-listed sites - New Italy and High Conservation Value Old Growth Forest | To be undertaken concurrently with the EIS. |
| NSW Heritage Council | To be undertaken concurrently with the EIS. | To be undertaken concurrently with the EIS. |

| Stakeholder | Objective | Date |
|---|---|---|
| Ballina Shire Council | Obtaining local environmental plan site data and information. | August 2010 |
| Clarence Valley Council | Obtaining local environmental plan site data and information. | August 2010 |
| Mid Richmond Historical Society, Richmond River Historical Society, Clarence River Historical Society | Obtaining background history and site information. | August 2010 |
| Peter Kuskie (South East Archaeology) and Jacqui Collins (Adise Consultants) | Obtaining information on previous reports and site data related to heritage assessment of previous development projects. | June-August 2010 |

## 2.9. Relevant guidelines

This assessment was undertaken and report prepared according to the principles outlined in:

- Australia ICOMOS *Charter for Places of Cultural Significance* (The Burra Charter) (Australia ICOMOS 2000)
- *NSW Heritage Manual* (NSW Heritage Office 1996) including the following sections:
  - *Investigating History* - used in undertaking research into historical context and history of individual heritage items
  - *Investigating Fabric* - used in surveying and recording individual heritage items
  - *Assessing Heritage Significance* (NSW Heritage Office 2001) - updated section of 1996 NSW Heritage Manual used to review existing significance assessment and undertake significance assessment for new heritage items
  - *Investigating Heritage Significance* (draft guideline) (NSW Heritage Office 2004) - updated section of NSW Heritage Manual used to undertake significance assessment for new heritage items
  - *Statements of Heritage Impact* - used in preparation of Statements of Heritage Impact
- Roads and Traffic Authority Heritage Guidelines (RTA 2004).

# 2.10. Legislation

## 2.10.1. Commonwealth legislation

### Environment Protection and Biodiversity Conservation Act 1999

The *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) protects heritage places of National significance as well as those which fall under Commonwealth ownership. The EPBC Act also provides protection to World Heritage properties listed on the World Heritage List as part of the UNESCO World Heritage Convention. Recent amendments to the EPBC Act created the Commonwealth Heritage List and a National Heritage List. Any actions that are likely to have a significant impact on the items listed in the World Heritage List, Commonwealth or National Heritage List must be referred to the Department of Sustainability, Environment, Water, Population and Communities for consideration.

## 2.10.2. State legislation

### Environmental Planning and Assessment Act 1979

The *Environmental Planning and Assessment Act 1979* (EP&A Act) requires that environmental impacts are considered in land-use planning, including impacts on Aboriginal and non-Aboriginal heritage. Various planning instruments prepared under the Act identify permissibility of land use and development constraints.

Projects approved under Part 5.1 of the EP&A Act, do not require approvals under the *National Parks and Wildlife Act 1974* or the *Heritage Act 1977* (as specified below). The management of heritage sites would follow identified mitigation measures and conditions of approval for the project.

### Local environmental plans

The development of local environmental plans is governed under the provisions of Part 3, Division 4 of the EP&A Act.

Heritage items, conservation areas and sites of archaeological potential in the project boundary are protected under the provisions of Ballina Local Environmental Plan (1987), Coffs Harbour Local Environmental Plan (2000), the draft Ballina Local Environmental Plan (2010), Clarence Valley Local Environmental Plan (2011) and Richmond Valley Local Environmental Plan (2012).

### Heritage Act (NSW) 1977

The *Heritage Act 1977* provides mechanisms by which items and places of heritage significance may be protected. The Act is designed to protect both listed heritage items, such as standing structures and potential archaeological remains or relics.

Approvals under Part 4 or an excavation permit under s139 of the Heritage Act are not required for an approved project under Part 5.1 of the EP&A Act. The notification obligation for the discovery of items that could meet the definition of a relic under the Act (s146) remains operative. However, Part 5.1 projects must outline proposed heritage management and mitigation measures.

Part 6 Division 9 of the *Heritage Act 1977* protects archaeological 'relics' from being 'exposed, moved, damaged or destroyed' by the disturbance or excavation of land. This protection extends to the situation where a person has 'reasonable cause to suspect' that archaeological remains may be affected by the disturbance or excavation of the land. It applies to all land in NSW that is not included in the State Heritage Register. A 'relic' is defined by the *Heritage Act 1977* as:

*Any deposit, object of material evidence which relates to the settlement of the area that comprises NSW, not being Aboriginal settlement, and has local or state significance.*

Section 139 of the *Heritage Act 1977* requires any person who knows or has reasonable cause to suspect that their proposed works would expose or disturb a 'relic' to first obtain an Excavation Permit from the Heritage Council of NSW (pursuant to Section 140 of the Act), unless there is an applicable exception (pursuant to Section 139(4)). In cases where a Section 139 permit is not required for projects assessed under Part 5.1 of the EP&A Act, works would need to be conducted in accordance with the intent of the *Heritage Act 1977*.

Part 3C of the *Heritage Act 1977* protects historic shipwrecks. Historic shipwrecks are defined by the Heritage Act as:

*The remains of any ship (including any articles associated with the ship) (a) that have been situated in State waters, or otherwise within the limits of the State, for 75 years or more, or (b) that are the subject of a historic shipwrecks protection order.*

Section 51 of the Heritage Act prohibits any person moving, damaging or destroying any historic shipwreck other than in accordance with a historic shipwrecks permit.

### National Parks and Wildlife Act 1974

The principal legislation for the protection, conservation and management of Aboriginal objects and places in NSW is the *National Parks and Wildlife Act 1974*. The objective of the Act is the conservation of places, objects and features of cultural value within the landscape, including, but not limited to:

- Places, objects and features of signficance to Aboriginal people
- Places of social value to the people of NSW
- Places of historic, architectural or scientific significance.

An 'Aboriginal object' is any deposit, object or material evidence, including Aboriginal remains, relating to the Aboriginal habitation of NSW, before or concurrent with occupation by non-Aboriginal people. An 'Aboriginal place' is an area declared by the Minister to be of special significance with respect to Aboriginal culture. An Aboriginal place does not have to contain physical evidence of occupation (such as Aboriginal objects).

This historical heritage assessment focuses on non-Aboriginal heritage and specifically excludes evidence of historical period Aboriginal use and occupation of the region. These are instead assessed in the Aboriginal cultural heritage assessment reports for the project.

## National Trust of Australia (NSW)

The National Trust of Australia (NSW) is a non-government community organisation which promotes the conservation of both built and natural heritage. The National Trust maintains a register of landscapes, townscapes, buildings, industrial sites, cemeteries and other items or places which the National Trust determines to have heritage significance and are worthy of conservation. Currently there are some 11,000 items listed on the National Trust's register. The listing in the register has no legal force. However, it is widely recognised as an authoritative statement of the heritage significance of a place. The National Trust does not have any control over the development or demolition of the listed places or items in its register.

# 3. Existing environment

## 3.1. Historical context

Historical context provides the framework to understand local site histories. It is used to establish the importance and rarity of the historical values associated with particular sites. It is easier to understand the history of a site if related to broader historical 'themes' that characterise Australia and NSW. Historical themes have been established by the Heritage Council of NSW (2001) and the Australian Heritage Commission (2001). Relevant themes identified for the region in which the project is situated are outlined in Table 3-1.

**Table 3-1: Relevant historic themes of the project region.**

| Australian theme (Australian Heritage Commission 2001) | NSW theme (NSW Heritage Council 2001) | Local theme | Site types |
|---|---|---|---|
| Peopling Australia | Aboriginal cultures and interactions with other cultures | Aboriginal life in pre-contact period | Camp site, ceremonial place, trade route, spiritual places. |
| Developing local, regional and national economies | Exploration | Exploration | Explorers route, marked trees, camp sites, mountain pass, water source, Aboriginal trade routes, landing sites |
| Peopling Australia | Aboriginal cultures and interactions with other cultures | Aboriginal contact with Europeans | Place name, conflict or massacre site, shipwreck contact site, missions and institutions, pastoral workers camps, timber mill settlement, Aboriginal reserves |
| Developing local, regional and national economies | Forestry | Cedar cutting, timber-getting and sawmilling | Cedar getters camps, timber mills and associated infrastructure, High Conservation Value Old Growth Forest |
| Building settlements, towns and cities | Land Tenure | Settlement and selection | Layout and subdivision |
| Building settlements, towns and cities | Towns and villages | Towns and villages | Commercial buildings, residential houses and subdivisions |
| Developing local, regional and national economies | Transport | Road and river transport | Fords, ferry crossings, bridges, shipping |
| Peopling Australia | Migration | Migrant contributions to the community | Migrant labour sites |

| Australian theme (Australian Heritage Commission 2001) | NSW theme (NSW Heritage Council 2001) | Local theme | Site types |
|---|---|---|---|
| Developing local, regional and national economies | Agriculture and Pastoralism | Corn and cane growing and dairying | Dairy factories and farms, butter factories. |
| Developing local, regional and national economies | Industry | Ship building, fishing, tallow and meat production. | Wharves and jetties; potential archaeological deposits relating to shipbuilding activities |
| Developing local, regional and national economies | Mining | Gold mining, Brick quarrying | Shafts, dredging locations, mullock heaps, quarries, kilns, discarded bricks |
| Building Settlements, Towns and Cities | Utilities | Water resource management including channel and canal development | Canals, water channels, regulator structures |
| Governing | Government and Administration | Aboriginal settlements, missions and reserves | Missions, churches, Aboriginal reserves, public infrastructure |

The following discussion provides a thematic history of the project region and provides some historical context for the predictive model developed in section 3.3.

### 3.1.1. Aboriginal life in pre-contact period

The Bundjalung people 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 the Bundjalung along the coastal plain and encompassing Ballina.

Prior to European settlement about 20 different dialects of the Bundjalung language were spoken north of the Clarence River to the Logan River in south-east Queensland (Collins 2005). The ethnohistoric record suggests that the lower Richmond River 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, around one person per 5 square kilometres (Pierce 1971 cited in Collins 2005).

The lower Clarence River was occupied by Yaegl (Yaygir) Aboriginal people, 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 cited in Collins 2008). According to Crowley (1997 cited in Collins 2008) his 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.

According to Tindale (1940 cited in Navin Officer 2009b) the Kumbainggiri occupied the headwaters of the Nymboida River across the range to Urunga, Coffs Harbour, Bellingen, Glenreagh and Grafton, west of the Yaegl language group. The Kumbainggiri spoke a language belonging to the Kumbainggeric Group. 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 1,200 and 1,500 people (Hoddinott 1978 cited in Collins 2008).

Within the area surrounding the project boundary there are four recognised language groups:

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

Additional information regarding the Aboriginal life in the pre-contact period is presented in the Aboriginal heritage component of the overall project assessment.

### 3.1.2. Exploration

In 1828 the Captain of the 'Rainbow', Henry Rous, recorded two entrances to the Clarence River which could not be entered for exploration due to large surf. Continuing north they identified the Richmond River where they dropped anchor and charted the entrance and inner banks (Daley 2001:11-12).

Rous sailed up the Richmond River as far as Broadwater (Daley 2001:2). Rous described the banks of the river as thickly covered with mangrove swamps on the east side and sub-tropical jungles of cedar on the west side. Early river travel was inhibited by the thick overhanging foliage, which often had to be cut away to allow passage of a ship's masts (Daley 2001:2).

The Clarence River was noted by the escaped convict Richard Craig in 1830. He made a report in Sydney, detailing the quantity and quality of the timber in the area, hopeful that this news would grant him his freedom.

The first vessel to enter the Clarence River was that of Thomas Small, who had eventually established a timber yard at Kissing Point, sailing to the Clarence River with 12 pairs of sawyers. Small established the first cedar base on Woodford Island in 1837. The second base was set up by Francis Girard at Tyndale (Bickford *et al.* 1998).

### 3.1.3. Aboriginal contact with Europeans

Early contact and assistance by Aboriginal people was documented by explorers in the region. First recorded contact on the north coast was in May 1770 when the Endeavour sailed up the coast of NSW. On 15 May 1770, Aboriginal people and Europeans had a glimpse of each other near the seven mile beach between Lennox Head and Broken Head (Prentis 1984:5). The Europeans observed a group of about 20 Bundjalung people, but in turn they were ignored. In August 1799 Matthew Flinders landed on the southern side of the Clarence River, near present day Yamba. Flinders and Bungaree, the Aboriginal interpreter from Sydney, found three substantial vine and bark huts, but met none of the Yaegl people.

As cedar workers and then settlers moved into the region and starting clearing and claiming land, conflicts arose. The coming of the cedar cutters disturbed the Aboriginal way of life. The cedar cutters intruded upon the Aboriginal hunting, gathering and spiritual environment less than the pastoral industry and certainly the agricultural industry which followed. Nevertheless instances of violence occurred. There were also instances of co-operation with Aboriginal people on the Clarence River helping to locate cedar trees and timber for ship repairs. Aboriginal men and women joined in clearing the brushwoods, felling trees and burning the timber (Prentis1984:12).

Conflict increased once settlers started to claim and clear land. Early accounts detail massacres at Evans Head in 1843 and at Ballina in 1853 (Heritage Concepts 2005:12). Aboriginal people were drawn to the security of food and shelter offered by pastoral stations, where they provided a casual labour force (NSW Heritage Office and Department of Urban Affairs and Planning 1996:59).

On the north coast the maintenance of language and spiritual observances, plus knowledge of locations and care for them, is a feature of early Clarence and Richmond societies (Gumbaynggir and Bundjalung) (McBryde 1997:312-313). McBryde cites Creamer's (1984:44-45) conclusion that there was strong continuity of cultural knowledge amongst both individuals and communities on the north coast, and that an important factor in this was the continuity of residence in their own country and language area for many communities and families. It made possible transmission across generations of knowledge about cultural practices together with information about the actual locations and places in the landscape associated with them.

### 3.1.4. Cedar cutting, timber-getting and sawmilling

Prior to European settlement, a large part of the region, from the coastal plain inland from Ballina to Lismore in the east and from Meerschaum Vale in the south to Goonengerry and Byron Bay in the north was covered by subtropical rainforest, called the 'Big Scrub'. Of the around 75,000 hectares of the Big Scrub present prior to European settlement, only one per cent remains in small isolated locations today. Figure 3-1 provides an approximate extent of the Big Scrub in around 1840.

Cedar was harvested along all the major NSW coastal rivers. Timber harvesting in the new colony of Port Jackson relied on wood found in the local environs. These timbers were difficult to work with and it would take some time for the settlers to adapt to the use and handling of these exotic timbers. Rainforest timbers were identified to the north of Sydney in the Hawkesbury region and cedar was the timber of choice. As a result the Admiralty in England requested that as much as possible be exported (Vader 2002:21). This demand rapidly increased the exploration of new areas and the harvesting of cedar from these areas.

Cedar cutters were on the Clarence River in 1837, the Macleay River by 1839 and the Richmond River in 1842 (Kass 1989:11; Trudgeon 1977:1). The first cedar camp on the Clarence River was established in 1837 by Thomas Small on Woodford Island (Kass 1989:11). The first cedar cutters in the Richmond River region were led by Steve King in 1842. They travelled up the Richmond River, naming the Pimlico area and Cabbage Tree Island. The first cedar was cut near Coraki (Daley 2001:6). Temporary camps were built along the rivers as cedar getters and their families moved upstream to exploit available resources (Trudgeon 1977:2). Temporary camps were established along Pearces Creek, Terania Creek, Emigrant Creek, Tintenbar, Teven Creek, Duck Creek and Wardell (then known as Blackwall) (Olley 1995:32).

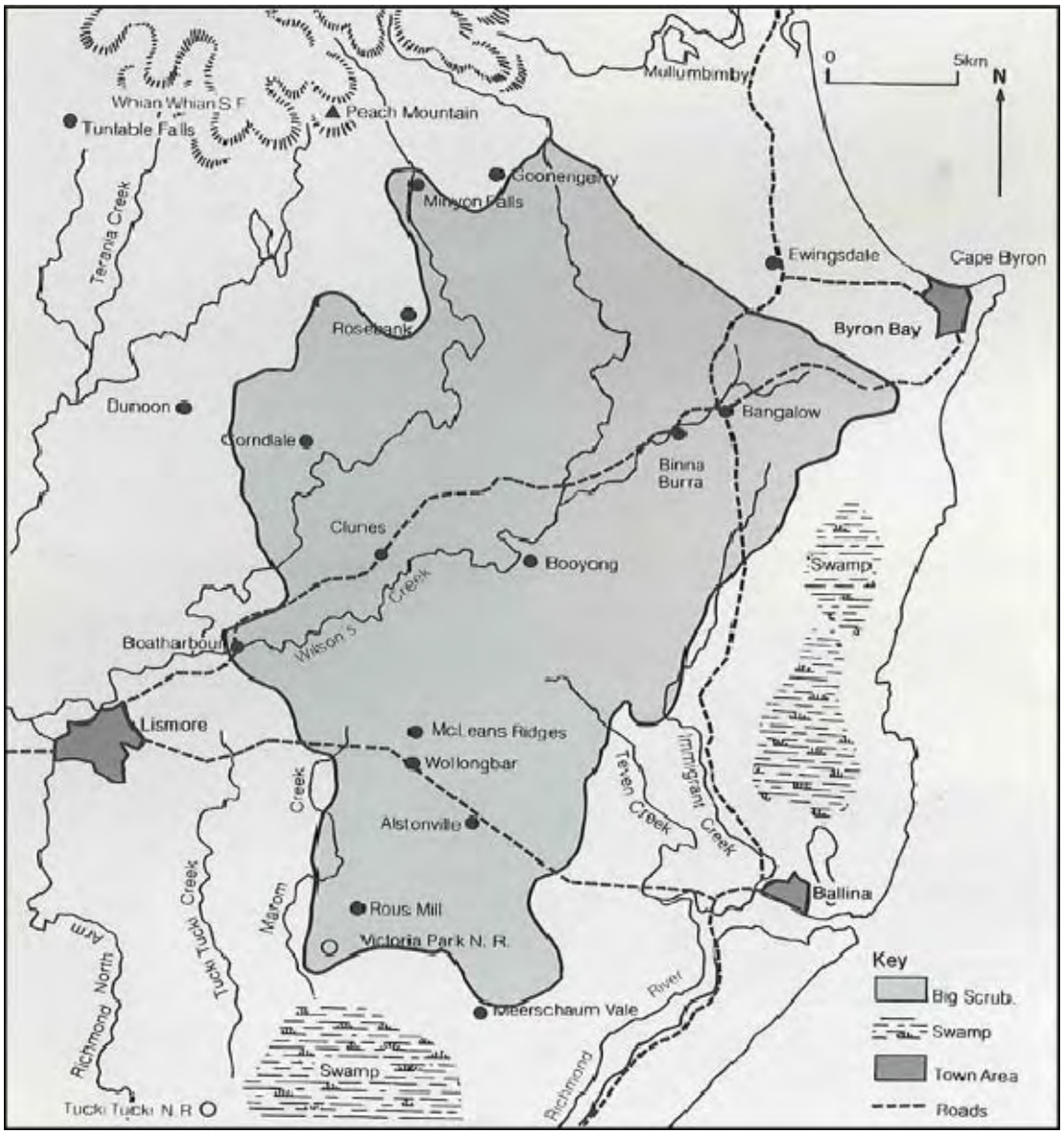



**Figure 3-1: Map of Richmond River District with approximate extent of Big Scrub in around 1840 (Frith 1976)**

Many people were involved in the cedar trade including cedar merchants, sawyers, bullock drivers, labourers to cut roads into the forest and rafters to convey the logs down to the river entrance for the waiting vessels.

The hardships of life for cedar cutters and their families have been documented as follows:

*...disorder was particularly prevalent among the cedar sawyers who are...generally convicts, who have become free by servitude; they live in pairs in the dense dark bushes; their habitation being merely a few sheets of bark temporarily piled together, as they are continually moving in search of fresh cedar. The cedar dealers furnish them from time to time with salt provisions, flour, tea and sugar* (Hodgkinson 1845, cited in Fox 1976:4).

Cedar was abundant in the river valleys, especially on the alluvial flats. Trees growing on the river banks were the first to be felled, as they could easily be rolled into the river for transport. The cedar getters followed the timber up non-navigable creeks, where logs were stacked in creek beds until heavy rains would wash them out (Trudgeon 1977:6). Once cedar cutters moved away from a river, bullock teams were used to drag logs to depots at deep water ports. Ports developed along the rivers with the increase in the cedar trade, including the establishment of Ballina on the Richmond River (Kass 1989:11).

Cedar brought wealth, developed river transport, established the timber industry and opened land for agricultural use. Large tracts of bush that had covered the region were cleared (Trudgeon 1977). Cedar felling initially concentrated in the lower portions of the valleys near rivers, which provided ease of transport and access. As the cedar was thinned out along river banks, the cedar getters had to move further into the Big Scrub. Transporting logs became more difficult, and bullock carts were often used for transport (Ramsland 1974) (Figure 3-2).

Early sawmills were opened at Ballina on the northern shore of Shaw's Bay in 1853. At this location small trading vessels could proceed no further upriver than Shaw's Bay because of river sand shoals (Ainsworth n.d.:13). A larger sawmill was built at Wyrallah by the Breckenridge brothers in 1865 (Daley 2001:8). Another sawmill was established at Blackwall (Wardell) by Thomas Carter for his son Ernest in 1868 (Gahan 2004:28). This sawmill was situated to take advantage of the Richmond River logging operations. The mill burnt down in the 1880s but was re-built to provide additional services including joinery and glazing (Mullins 2001:17).

As cedar resources were depleted, attention was diverted to other timber types such as hardwoods like mahogany and tallowwood. Up until World War II, hoop pine was the main harvest timber. Construction after the war caused a demand in timbers which previously were considered inferior, such as spotted gum, flooded gum and brush box (Trudgeon 1977:27). Timber getting has had a huge impact on the landscape throughout the region. A small section of the Big Scrub is protected on the Local environmental plan-listed Tropical Fruit Research Station at Alstonville. Other parts of the Big Scrub are protected in various nature reserves. Sections of ecologically mature eucalypts are protected in the north-east region within various national parks and nature reserves and in the state heritage-listed High Conservation Value Old Growth Forest.

The demand for timber was further increased by the outbreak of World War I. This increase in money and demand for timber created new logging methods. Traditional saw pit methods were replaced by sawmills which were set up close to the timber source. The smaller mills tended to be mobile, staying in one place for a period of about two years before being moved on to a new area. Larger mills were more permanent in nature although they too responded to the need for remaining close to the raw material source. Larger mills often acted as a catalyst for the establishment of small settlements, which remained after the mills had moved on.

**Figure 3-2: Man beside a bullock dray loaded with cedar, Richmond River, NSW c 1886 (CH Kelly) (National Library of Australia ref 4312945)**

### 3.1.5. Settlement and selection

While cedar getters entered the lower reaches of the river valleys, the squatters were occupying the grasslands of the upper reaches. In 1840, Henry Clay and George Stapleton, arrived in the region and marked out and claimed Cassino Station on the Richmond River (Mullins 2001:1). Pastoral licenses were issued on an annual basis from 1843 until 1848, after which time the leasehold period was lengthened (Olley 1995:17). These squatters occupied a large portion of crown land and stocked it with sheep or cattle under a licence (from 1839) for use of the land (Daley 2001:3). After the Robertson Crown Lands Act 1861, many farms were taken up in this decade. Land mania set in at the Big Scrub, 40 to 640 acre farms were available, and small scale speculation in land was a local excitement (Bickford *et al.* 1998).

By 1845 21 stations were settled on the Richmond River stretching north from the Clarence River bounded by the mountains to the north and west. There were few stations within the project region itself, due to the vast expanse of the Big Scrub as depicted in Figure 3-1. Ellangowan Station on the south side of the Richmond River covered an area of 76,800 acres, including the current location of the town of Woodburn. Ellangowan was first leased by Alexander and William Busby in the early 1840s, but by the following year it was under the name of Clark Irving. A visit by the Crown Lands Commissioner in 1844 recorded the presence of two huts with three occupants, 450 cattle and four horses (Olley 1995:18, 66).

Squatting licences were first taken out on the Clarence River in 1839, and most of the valley was taken up in a very short time. Surveyor Peppercorne laid out Casino, Lismore, Codington, and Deptford (Ballina) at the heads. Rural land near the Clarence River was sold slowly at first. Scottish farmers were interested, as were the tenant farmers coming north from the Hunter and Williams Rivers.

### 3.1.6. Towns and villages

The north coast of NSW consists of rocky headlands and barrier dune systems, which provide little scope for agricultural production. There are few good natural ports in the region and the river mouths themselves provided the main access from the ocean, even with risks posed by sand bars and changing tides (Heritage Office and Department of Urban Affairs and Planning 1996:59).

Until the mid 1850s, the majority of people in the region did not own the land they lived on. When the early towns in the region were surveyed by FS Peppercorne and allotments were offered for sale, settlement began in earnest (Daley 2001:12). The Robertson Crown Lands Act 1861 allowed people to buy land on Conditional Purchase before survey with the land to be paid off within three years (Daley 2001:12). These new settlers faced the daunting task of clearing the scrub, building some form of shelter and supplementing their meagre rations with home grown produce. Bark huts with dirt floors were the quickest and cheapest form of shelter. The influx of settlers during the 1860s created a hierarchy of towns, villages and hamlets throughout the region, depending on the agricultural pattern and the density of the settlement. Along the Richmond and Clarence Rivers small ports linked to maize or sugar were established. Some grew to be major centres, such as Ballina and Maclean. The later occupation of the Big Scrub for dairying created an inland network of small towns (Kass 1989:20).

The following provides a summary of the development of the key towns and villages within the project region.

#### Woolgoolga

Cedar cutters first entered the area in the 1830s, but a permanent settlement was not established until the 1870s. The first European settlement of the Woolgoolga district occurred in the late 1870s at about the same time as the settlement of Coffs Harbour. The first permanent record of settlement in this area was in 1870 when Run No 104 named Weelgoolga and comprising 25,000 acres of Crown land was gazetted. Thomas Small of Ulmarra was the first lessee of the run (Connell Wagner 2002:3).

The first farmer selector to settle in the Woolgoolga area was William Sare in the 1880s. Several other farmers and their families settled in the early 1880s. The main pursuit of these first farmers was sugar cane growing. The village, originally known as Woolgoolga, was officially gazetted in 1888. The name was changed to Woolgoolga in 1966 (Connell Wagner 2002:4).

By the end of the 19th century timber milling and the cutting of cedar were important in the area although Woolgoolga was never a major timber milling centre. Apart from the timber activity there were a number of attempts to farm a variety of crops. By the 1890s there was a jetty near the town which was being used by the sawmills. By the turn of the century bananas were being grown but it was not until around the 1930s that they were grown with any success.

Indian settlement in the area commenced around 1939 and the first Sikh temple opened in 1968 in Hastings Street (Connell Wagner 2002:4).

### Maclean

Maclean was originally referred to as Rocky Mouth, because of rocks at the mouth of the South Arm near the surveyors camp. The township of Maclean was laid out by the Surveyor-General, Alexander (Alister) Maclean in 1862 and renamed Maclean by the Government Surveyor Greaves.

### Harwood

The township of Harwood was established on Harwood Island to service sugar cane farming and milling operations. The Harwood Mill has been the central component of the sugar industry on the Lower Clarence River since 1873. It is the oldest continuously operating sugar mill in NSW and is one of only three sugar mills remaining in NSW.

### Woodburn

Woodburn was also first referred to as Rocky Mouth by early cedar getters. Squatters, the Busby brothers, took up Tuckombil Station in the vicinity of Woodburn in 1844. They were joined by Billy Wright, a timber merchant and two shipwrights (Davis and West) who came to Rocky Mouth to build two ships for Wright (Newman 1985:6). The town was officially named Woodburn by William Gollan, an early settler and the first postmaster, in 1896 (Newman 1985:6).

In the 1870s Woodburn developed rapidly as a result of the sugar cane industry and was the location of the shortest overland route to the Clarence River where a steamer to Sydney could be caught (Newman1985:8). By 1886 mail to and from Sydney came overland and Woodburn was established as a depot for coach travel. Woodburn was also the location of one of the main depots for the small passenger steamers which travelled the Richmond River (Daley 2001:20).

### Broadwater

Broadwater was originally part of a selection held by selectors Henry Cook and Alexander MacDonald. The town became more established with the construction of a sugar mill in 1881, which resulted in the building of barracks, managers' houses and many workers cottages. Several hotels were built before the 1880s (Daley 2001:19).

Early accounts (Mullins 2001:55) indicate that from Broadwater to Ballina '...both banks (of Richmond River) are disfigured by small, wretched, tenantless cabins...relieved occasionally by a cottage of the better sort, neat and tidy'. This provides an insight into the transitory nature of many camps and settlements, fuelled by waves of workers brought to the region, first by the timber trade and then by the gold rush.

By the 1880s Broadwater became one of the main centres for the sugar industry as the local area under sugar cane cultivation increased. CSR sought to establish a mill on the Richmond River.

Sites at Woodburn, Wardell and Rileys Hill were deemed unsuitable and a property on the eastern side of the Richmond River at Broadwater was purchased. The CSR mill was completed in August 1881 (Smith 1991:25). During the same period a store, public hotel and post office were also established. The first school classes were held in the Union Church in 1881, soon after the mill began operation. The first proper school was constructed in 1885 (Gardiner 2007).

### Wardell

Wardell was founded as a township called Blackwall by cedar getters in around 1850 (Gahan 2004:24). Blackwall was one of the smallest settlements during this early occupation period. The town was laid out in 1855-6 by Peppercorne during his survey of the region and a school was established in 1867 (Gahan 2004:24, 45).

The establishment of two of the first sawmills in the region, operated by Ernest Carter and James E James, ensured its success (Mullins 2001:54). By 1881, there were three hotels, a court house, a post and telegraph office, a number of stores and a ferry. The construction of a timber wharf in 1887 increased the town's accessibility and trade options. Cedar trade began to fall at the end of the 1890s, resulting in reduced work for the saw mills in Wardell.

### Ballina and East Ballina

East Ballina was first settled by sawyers who settled near the mouth of the Richmond River and built bark huts near a spring on the north headland (Daley 2001:15). Conditions in the early settlement were very rough, with no roads or services for the population. The discovery of gold in the area in the 1850s brought prosperity to the region. The town was surveyed by FC Peppercorne in 1856.

Ballina was a secondary settlement, founded after the settlement of East Ballina (on the north headland). With an increase in shipping, population growth and the opening up of new areas for cedar harvesting, the settlement was moved from East Ballina to Ballina proper (Ainsworth nd:7). Ballina (formerly named Deptford) was laid out and surveyed in 1859. Ballina grew with the shipping industry and became an important centre of shipping and transport.

## 3.1.7. Agriculture and pastoralism

Early farming within the region was primarily subsistence-based, and until the late 1890s the main farming industries were pig farming and corn and sugar cane growing. The dairying industry developed at this time, with export of butter and other dairy products from the region (Trudgeon 1977:25).

Early settlers planted vegetables in their cleared plots. Corn and pumpkins were the most favoured with some sugar cane. Corn was grated into a powder, eaten as porridge and used as flour in damper. They also supplemented their diet with bush food such as wallaby, possum, brush turkey and ducks. Sheep farming was not very profitable in the Richmond region as large numbers of animals succumbed to disease. By 1848 most leaseholders were changing to other livestock mainly cattle (Daley 1966:51). Excess cattle were rendered into tallow which was exported from the

region. Tallow processing became a local industry in the 1850s (Daley 1966:52). It was not until the introduction of meat preserving and canning technology did the meat trade in the region become established. Charles Tindal set up the Ramornie Meatworks upriver of Grafton on the Clarence in 1862, and by 1875 it was the largest meat processing plant in Australia. The Meatworks operated until 1925 (Kass 1989:9).

Early dairy farming was limited by due to the re-growth of cleared land, and the abundance of native grasses such as kangaroo and foxtail which were unsuitable for milk production (Trudgeon *et al.* n.d.:5). In addition, once the vegetation of the Big Scrub was removed the deeps soils became porous and unsuitable for imported grasses. However, at first the soils were very fertile and the mild winters, meant that milk could be produced over the whole year (Trudgeon et al nd:5). Farming flourished following the introduction of paspalum grass into the area. The first jersey cows were brought into the region in 1878.

Farmers from the South Coast of NSW moved to the region taking up land with similar soils to those suitable for dairying in the south. This saw the opening up of the land of the Big Scrub rather than the floodplains which had been the focus of timber and sugar cane. The isolation of the region from major markets and the difficult with transportation of liquid milk saw the industry focus instead on cheese and butter production (Kass 1989:17). In 1886 a cheese factory was established on the Clarence River at Ulmarra (Kass 1989:17) followed by a large commercial butter factory established about two miles downstream of Lismore in 1889. This factory was capable of producing five tonnes of butter per day, the bulk of which was soon being exported to England (Trudgeon et al nd:8). By the 1890s a network of co-operative creameries had been established through the Clarence Valley (Kass 1989:17). Farmers in the region also established piggeries due to the large amounts of unused skimmed milk resulting from cream production, and bacon and ham became by-products of the dairying industry.

By 1910 the North Coast region was the prime focus for dairying in NSW, and by the 1930s dairying challenged sugar cane as the main activity in the Clarence Valley. In 1931 the Ulmarra butter factory exported just under 4.5 million pounds of butter and the Grafton butter factory 2.5 million pounds which equated to 60 per cent of all butter produced in NSW (Kass 1989:27-28). The changes in technology following World War I meant that the dairy industry was no longer dependent upon the local processing of raw milk into butter. New refrigeration techniques and speed of transport enabled the raw milk to be transported to larger centres for processing and many local butter factories closed.

Towards the late 1930s and into the early 1940s the industry was supporting many inefficient dairy producers due to the centralised price supports put in place during the Great Depression. The family farming model was still in place for dairying in the region long after it had become uneconomic in other rural industries. Too many farms were producing for a static and declining market. Farmers began leaving the industry in increasing numbers following World War II (Kass 1989:28). With the decline of the dairy industry some farmers diversified into growing other crops including bananas, avocadoes and potatoes. Some farmers were bought out by Australian Paper Manufacturers and the land was turned over to timber plantations which were in recent years taken over by NSW State Forests.

The agricultural industry saw an early decline with overproduction by hundreds of selectors in the region and cheap imports of other fodder crops flooding the market. This saw the focus of agricultural production turn to sugar cane (Kass 1989:14). Sugar cane was first grown near Lismore as early as 1861 and on the lower Richmond River in 1866 (Trudgeon et al nd:1). Sugar was initially produced in very crude conditions at Yabsley's ship building shed in Coraki. By 1871 six small mills had been erected in the region, however, none of these were capable of processing large commercial quantities. Eventually mills were established at Woodburn, Broadwater, Wardell,

Pimlico and Harwood within the project region. By the 1880s the network of mills run by the Colonial Sugar Refining Company (CSR) was firmly in place on the Tweed, Richmond and Clarence Rivers. The development of ports to service the sugar industry saw a network established along the Richmond and Clarence Rivers for transport of cane to the mills. Some ports, such as Maclean, later became major ports (Kass 1989:16).

A large central mill was established at Broadwater in 1880, which was one of the first big central mills in Australia. The mill could crush 900 tons of cane per day, compared with the two to three tons of the smaller mills (Trudgeon et al nd:10). The Harwood Mill has been the central component of the sugar industry on the Lower Clarence River since 1873, as noted above. It is the oldest continuously operating sugar mill in NSW and is one of only three sugar mills in NSW. Major changes to the mill over the last century included the introduction of the cane derrick in 1913 and the building of tramlines in 1925-1931 by CSR to transport the cane more efficiently to the mill. Other changes included the introduction of bulk handling of raw sugar for shipment to refineries in 1954 and the start of mechanical harvesting in 1974 which resulted in the replacement of water transport with road transport. The sale of the Harwood Mill in 1979 to the NSW Sugar Milling Cooperative was another major change (Gardiner 2006). These mills continue to operate at both Broadwater and Harwood under the management of the NSW Sugar Milling Co-operative.

Other agricultural developments in the region included many attempts at a variety of tropical fruits from the early 19th century. Bananas were the most successful example with the first success being in the Clarence Valley at Ulmarra. The success of bananas soon saw them planted near most farmhouses, but the major commercial areas became Coffs Harbour and the Tweed Valley (Kass 1989:19).

### 3.1.8. Water resource management

The unique interplay between water and agriculture in the region necessitated the building of infrastructure to manage water within the environment. Drainage problems south of Woodburn at Rocky Mouth Creek, resulted in the excavation of the Tuckombil Canal in 1895 (GHD 2008:1). The purpose of the Canal was to provide a flood relief measure, following severe flooding in the 1890s. The objective was to drain flood waters from Bungawalbin Creek, Sandy Creek, Moonem, Swan Bay, New Italy, Oaky Flat and Rocky Mouth Creek catchment areas via a shortcut across country (the Tuckombil Canal). The original construction included a sandstone flagstone causeway, constructed above high tide level to prevent tidal exchange between the river systems. The original canal was relatively shallow and terminated in the head waters of the Evans River, which, at the time, comprised heavily wooded melaleuca swamps and small tributary streams. Following major floods in 1945, 1948 and 1954, a flood mitigation plan was formulated for the local area. This plan included a proposal for the widening and deepening of the Canal. The dimensions of the Canal were significantly altered in 1965 when the Canal was widened and deepened. In 2001 a temporary concrete weir was built across the Canal to prevent saline inflow from Evans River in non-flood periods (GHD 2008:1).

Other water management infrastructure in the region includes the multitude of shallow channels which meander through the cane fields, draining excess water. These drainage systems were developed by drainage unions. The impetus for these organisations was the Drainage Promotion Act 1865, which allowed landowners in flood prone areas to form unions for the purpose of establishing drainage works. Further legislation, the Water and Drainage Act 1902, established public funding for drainage works (Heritage Concepts 2005:27).

### 3.1.9. Other industry

A range of other industries developed alongside the timber getting, agriculture and pastoral activities in the region. Demands for ships exceeded supply in the 1860s through to the 1880s as the timber trade flourished. Ship building became an important business as entrepreneurs took advantage of the local timber industry. The first wooden vessels were built at Woodburn in 1847, and ship yards were established on the Clarence River where William and Edward Chowne built a 240 ton vessel in the same year. The Chownes built small vessels suited to the river trade (Bickford et al 1998:44; Kass 1989:12). Ships were also locally built by William Yabsley at Coraki from the 1850s (Gallagher 1972). There was a boom in shipbuilding by the 1870s, before the iron hulled steamships displaced them and became more commonly used from 1872 onwards (Daley 2001:10). By the 1890s the ship building industry was largely defunct in the region (Kass 1989:12).

The shipbuilding industry provided the key method of transport to link the producers with their markets. Despite this, those raising livestock in the region had difficulties in reaching the markets for wool and fresh meat so turned to the tallow trade from the 1840s. The first boiling down works for the processing of animal carcasses into fat (or tallow) was established on the Clarence River near Grafton by Joseph Sharpe in 1844 (Kass 1989:9). This was followed by another works established on Cassino Station on the Richmond River. Within a short period of time the Clarence Valley was second only to the Hunter Valley for production and shipping of tallow to Sydney, reaching 89 tons of tallow shipped in 1846 (Kass 1989:9).

Commercial fishing in the region suffered early problems in trying to capitalise on the valuable marine resource due to the distance to its markets. Oyster leases were established on the Clarence River at Iluka and Yamba in 1884. In 1887 they shipped 121 bags of oysters to Sydney, which grew to 1716 bags by 1892. In the early 20th century the Clarence River was one of the largest shippers of seafood to the Sydney market. In 1945 the government began pushing for the establishment of fishing co-operatives in order to improve marketing, and the Clarence River Co-operative was established in that same year. A processing plant was established in Iluka in 1973 and the Clarence River continues as an important source of seafood (Kass 1989:27).

### 3.1.10. Road and river transport

Shipping was the main means of transport in the early years of settlement in the project region, and facilitated movement of workers, supplies and materials along the coast and inland along the rivers (Gallagher 1972). The first ship in the Richmond River area was the *Sally*, which in 1842 brought Steve King and his cedar getters into the region.

Up to 30 ships were wrecked in the Richmond River entrance between 1855 and 1907 on account of the shifting sand bars and exposed rocks (Gallagher 1972). In 1855, a permanent pilot was employed to guide ships through the heads into the river (Gallagher 1972). Hazards were increased once inside the heads with narrow channels restricting the use of sails, resulting in a reliance on tug boats, rowing boats or tides (Gallagher 1972). A breakwater was built at Ballina in 1889 which increased safety and navigation of the heads (Daley 2001:10). Forty-one shipwrecks are recorded as having occurred in or near the Clarence River from 1841 to 1968, with 81 being recorded in or near the Richmond River between 1869 and 1945 (Australian National Shipwrecks Database 2012).

The Richmond and Clarence Rivers were very busy with the punts of local residents, who would pull their way along the rivers over short distances to travel from home to church, school or to visit. They also transported their produce to wharves for loading onto larger boats for transport (Gahan 2004:36).

Maritime infrastructure began developing in the mid-1800s to service the early settlements, ship building operations, sugar cane mills, timber traders and mills. Early infrastructure included timber and stone wharves, dry docks and associated buildings, cane derricks and jetties (Curby and Coroneos 1997).

Early tramways were constructed for the easy transport of timber. Some of the tramways were constructed long distances into the forests. This combined with the location of many new jetties encouraged the export of hardwoods and removed the dependence on maintaining pastures for the bullocks (Bickford et al 1998). Sawmills built and operated the tramways at their own cost to bring logs to their mills. Later, tramways were established in towns to transport sugar cane from harbour to mill. Tramways were constructed at several key ports, including Harwood, Woolgoolga and Coffs Harbour (Figure 3-3).

**Figure 3-3: Tramway transporting cane in Harwood (National Library of Australia, ref 4590846)**

Some of the first roads in the region were the rough roads cut through the bush by cedar getters for use by bullocks and carts (Gahan 2004:38). The opening of roads in the district enabled easier movement away from the coastal fringe and the waterways. In 1843 James C Burnett was commissioned to survey the entire length of the Richmond River. Burnett cut a road from Brisbane to the upper Richmond River and on to Casino (Daley 2001:2). At this time local roads were

generally nonexistent, and horse or bullock trails were difficult to negotiate, so river transport dominated until the 1880s. An increase in timber demand in the 1880s allowed the development of better road and bridge infrastructure as settlement moved away from the river frontages (Vader 2002:165). While most communications in the region were with Sydney rather than between the valleys transport connections were established between the valleys with a regular coach service which ran several times a day timetabled to connect with river boats. The service ran between the Clarence and Richmond Valleys via the shortest route, from Chatsworth to Woodburn (Kass 1989:13).

Many of the original roads used by selectors in travelling to and from their farms are still in use, such as the road to Duck Creek (now the Pacific Highway) and the road from Wardell to Meerschaum Vale (Gahan 2004:38). The condition of early roads was frequently an issue, with wet weather making many roads impassable. The condition of roads only began to improve in 1906, following the introduction of shire councils (Gahan 2004:39). By the 1930s roads in the region were being surfaced with locally quarried stone.

The only major road in the region in 1858 was from Armidale to Grafton and up to Ballina (Figure 3-4). By 1895 the major roads began to represent a route similar to the existing Pacific Highway with a road from Coffs Harbour to Grafton, then north through Maclean and Woodburn to Ballina (Figure 3-5).

### 3.1.11. Pacific Highway

It was not until 1909 that a continuous route, approximately following the Pacific Highway route, was available between Hexham (north of Sydney) and Tweed Heads (just south of the Queensland border). This route had few bridge crossings over rivers and relied on ferries to make the crossing. The general use of motor vehicles for transport followed World War I, with the roads on the main North Coast Road (as the road was then known) comprising earth formations creating dusty conditions in dry weather and muddy conditions in the wet (Laybutt 2011).

In August 1928 the newly-formed Main Roads Board of NSW proclaimed the main North Coast Road running from Hexham through Gloucester, Taree, Port Macquarie, Kempsey, Macksville, Nambucca Heads, Coffs Harbour, South Grafton, Maclean, Woodburn, Ballina, Bangalow, Byron Bay, Mullumbimby and Murwillumbah to Tweed Heads, as State Highway No 10 and named it the ‘North Coast Highway’ (Laybutt 2011). In 1931 the Main Roads Board approved the adoption of the name ‘Pacific Highway’ for the coastal highway from Tweed Heads to Sydney in line with the naming of the coastal road from Brisbane to Tweed Heads (Brisbane Courier 14 April 1931).

Several major deviations were constructed in the north coast region during the initial period of highway development between Bangalow and Ewingsdale (1931), through Brunswick Heads (1945), and around Mullumbimby (1954) (Laybutt 2011). Improvements continued through the early to mid-20th century with upgrading of surfaces, changes of alignments and the construction of bridges.

Bridge construction on the Pacific Highway began as unemployment relief during the Great Depression in the 1930s including construction of the bridge across the Clarence River North Arm at Mororo in 1936. By the 1960s, only two vehicle ferries remained in use on the Pacific Highway – both within the project region at the Richmond River and the Clarence River. In April 1964 a bridge was opened across the Richmond River at Wardell replacing the ferry. The final ferry was decommissioned and replaced by the Harwood Bridge over the South Arm of the Clarence River in 1966 (Laybutt 2011).

From 1974 work on the highway declined dramatically with the restructuring of Federal road funding. The National Roads Act 1974 enabled the declaration of National Highway links between capital cities which would then be funded solely by the Federal government. The New England Highway was prioritised over the Pacific Highway for Federal funding which led the NSW Department of Main Roads to undertake a large number of small realignments to the Highway during the 1980s including at Woolgoolga, Dirty Creek Range, Chatsworth and Ballina. Only a small number of larger projects were carried out during this time on the north coast including a bypass of Nambucca Heads, dual carriageways through Coffs Harbour and Sextons Hill near Tweed Heads, and the first stage of the Tweed Heads Bypass (Laybutt 2011).

In 1991, the NSW State government identified the North Coast Corridor from Hexham to the Queensland border as one of the fastest growing regions in the state, changing the perception of the Pacific Highway. It was no longer seen as a thoroughfare to Brisbane but the key to an economic region 700 kilometres long and up to 100 kilometres wide. The fragmented economy and high unemployment of the region increased the importance of the highway (Broomham 2001:180). Work on upgrading the Pacific Highway in the first half of the 1990s was entirely state government funded. In early 1996 the Federal government signed an agreement to jointly fund an accelerated upgrading of the Pacific Highway. The program commenced in September 1996 converting 16 per cent of the highway between Hexham and Queensland to dual carriageway by 1999 (Laybutt 2011).

The extensive reconstruction program which realigned much of the highway between the late 1950s and mid-1980s bypassed some sections of the original highway, with most being retained for local use. Key changes to the Pacific Highway of relevance to the project area are listed in Table 3-2. These changes and the remnants of earlier sections of the Pacific Highway are detailed by project section in section 3.5.

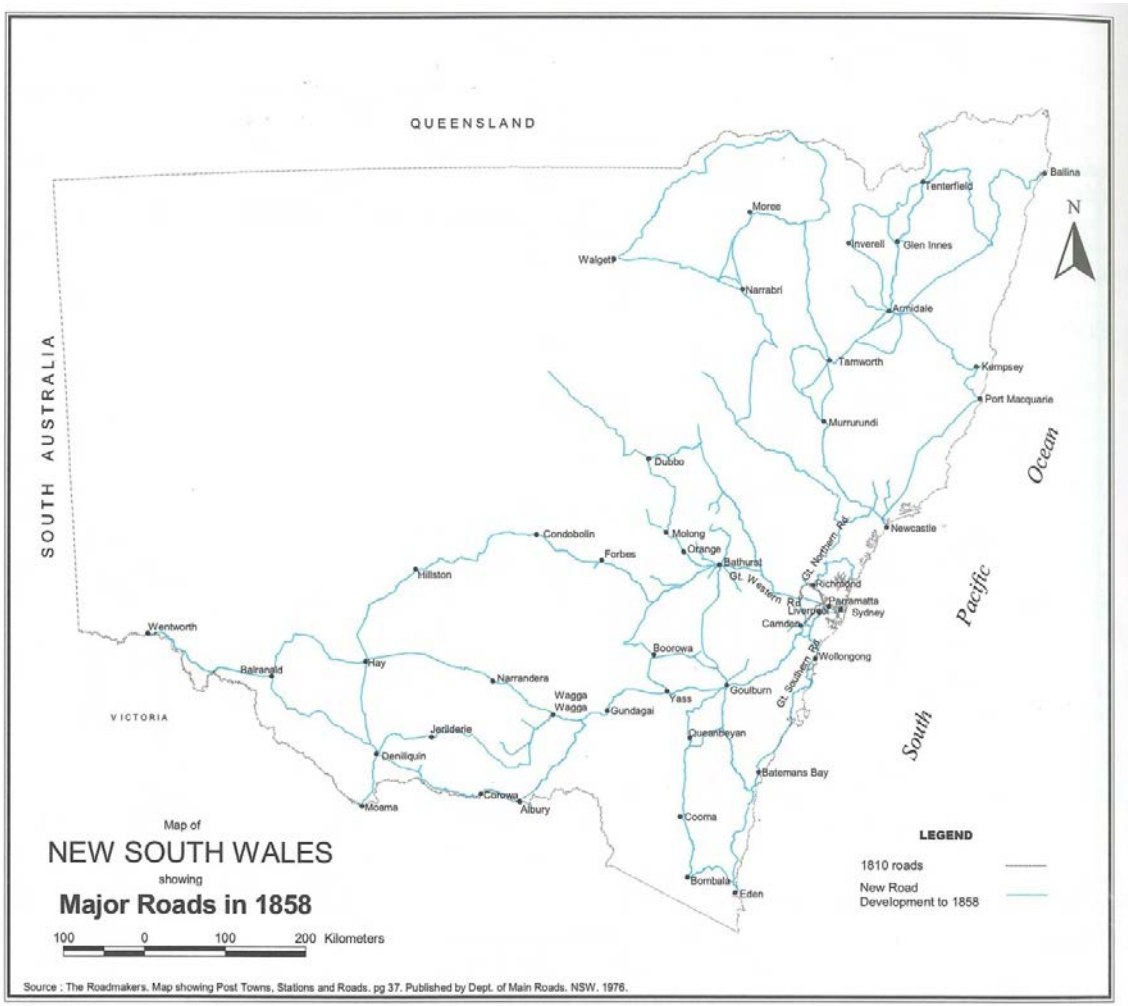



**Figure 3-4: Major roads in NSW in 1858 (Broomham 2001)**

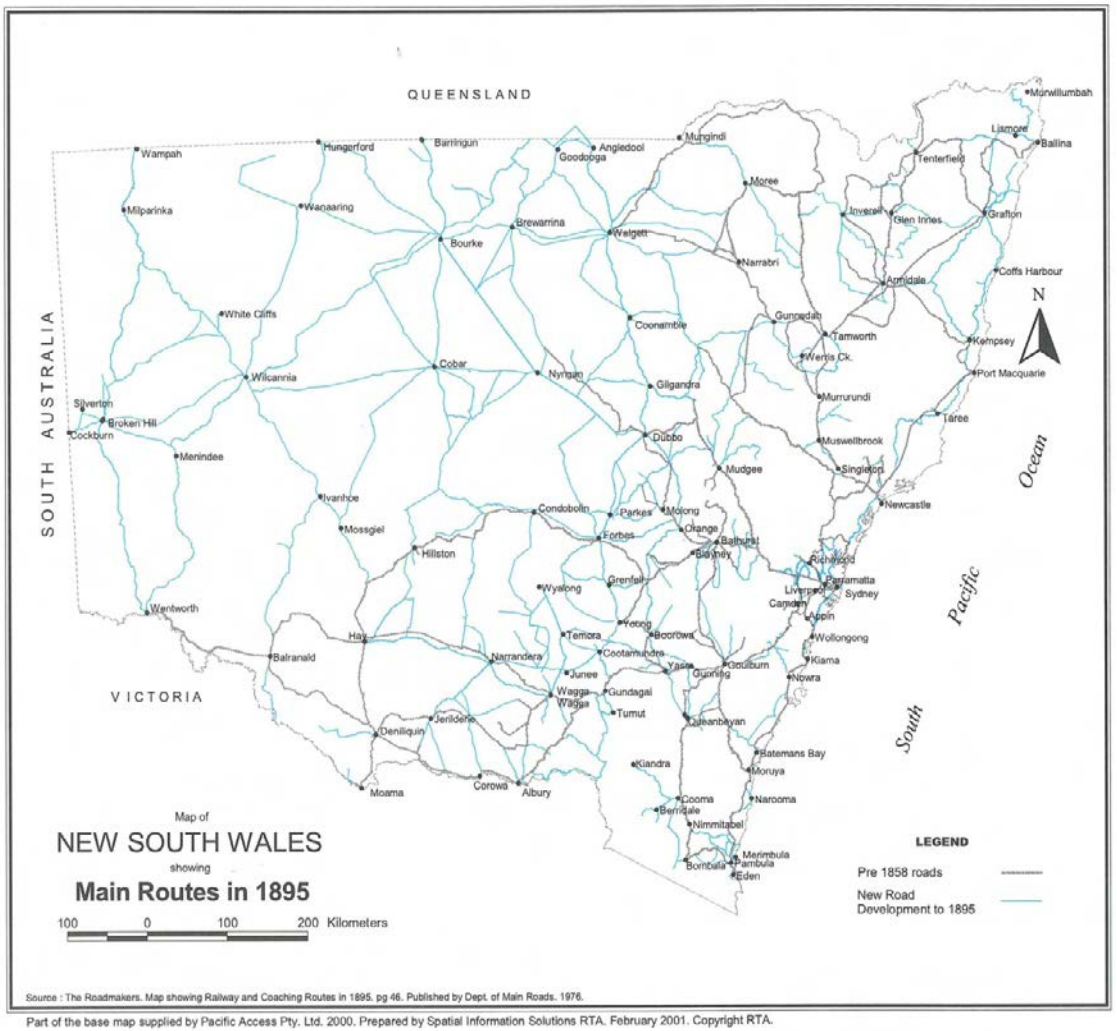



**Figure 3-5: Main routes in NSW in 1895 (Broomham 2001)**

**Table 3-2: Key changes to Pacific Highway relevant to the project (based on Laybutt 2011)**

| Year | Event |
|---|---|
| 1928 | Proclaimed State Highway No 10 and named North Coast Highway between Hexham and Tweed Heads |
| 1929 | Ulmarra deviation |
| 1931 | Named Pacific Highway and extended from Hexham to North Sydney |
| 1934 | Dirty Creek Range deviation (original) |
| 1935 | Mororo Bridge over Clarence River North Arm |
| 1939 | Concrete pavement completed between South Grafton and Ulmarra |
| 1953 | Deviation at Cassons Creek, north of Corindi Beach |
| 1956 | Deviation on approach to old Shark Creek bridge, near Maclean |
| 1957 | Deviation north of Woolgoolga |
| 1958 | Pacific Highway sealing completed |
| 1964 | Bridge over Richmond River at Wardell and deviation, replaced Burns Point Ferry |
| 1965 | Woolgoolga deviation |
| 1966 | Harwood Bridge over Clarence River South Arm. Replaced last remaining ferry crossing on Pacific Highway |
| 1970 | Proclaimed a motorway between Coffs Harbour and Grafton |
| 1971 | Deviations at Tabbimoble |
| 1980 | Double Crossing Creek deviation, north of Coffs Harbour |
| 1980 | Corindi Beach deviation |
| 1984 | Deviation at Jacky Bulbin, north of Mororo |
| 1986 | Shark Creek bridge and deviation |
| 1986 | Deviation at Devils Pulpit State Forest |
| 1986 | Chatsworth deviation |
| 1987 | Dirty Creek Range deviation |
| 1989 | Deviation from Alipou Creek to Swan Creek, north of Grafton |
| 1991 | NSW State government begins highway upgrading |
| 1993 | Mororo Bridge duplication |
| 1998 | Gap Road upgrade |
| 2000 | Tyndale realignment |
| 2004 | Halfway Creek upgrade |

### 3.1.12. Gold mining and brick manufacture

Gold was discovered in NSW in 1851. The early gold discoveries were made on Crown land and the issuing of a miner's licence legitimised the occupation of the Crown land. The gold rush of the early 1850s increased the demand for cedar and created many more jobs in the cedar industry (Bickford et al 1998:41).

Gold was discovered at Ballina in the 1850s (Ainsworth nd:9). This had a profound effect on the development of regional towns and villages and also increased the demand for timber in the region. Gold was also found near Woolgoolga along the Orara River in the 1870s and further discoveries were made in the 1890s. By 1895 there were 220 men on the Orara gold field (Bickford et al 1998:41).

Another key resource quarried in the area was clay used for brick making. Bricks were produced locally and transported short distances for use in housing and infrastructure. From the 1870s brick was used most often in public buildings such as the Maclean Court House and local primary schools. Prior to the 1880s bricks were often made on site but in the 1890s Robert Page established a brickworks at his property below the Lookout at Maclean. Page bricks were used for the building of the 'Highfield' residence at James Creek. The brickworks closed in 1946 but traces of the brick kilns can be found on site (Gardiner 2006:51, 52). Other local clay quarries have been noted, although not listed on any heritage registers, at Broadwater (Byrne family property), Meerschaum Vale and Lang Hill.

### 3.1.13. Aboriginal settlements, missions and reserves

Reserves were areas set aside by the NSW Government as places for Aboriginal people to live. Most of the reserves were hidden away from white communities. The nature of reserves varied from church missions, which were regulated and managed by church representatives, to reserves which were deeded to an Aboriginal community and held and farmed by Aboriginal people.

Some small reserves were established in 1849, with a view to protection and assimilation. They were not intended for subsistence but as camping places in their hunting grounds and away from towns and inns (Bickford et al 1998: 34). During the later 1860s and 1870s the Aboriginal groups of the project region were heavily affected by intensification of European settlement following the Crown Lands Act 1861. They lost jobs and access to land as pastoral runs were cut up for small grazing selections and then increasingly for intensive wheat farming.

The Aborigines Protection Board was established in the 1880s. The Board's role initially involved overseeing the distribution of blankets, rations and various other goods to Aboriginal people. In later years, the formation and management of reserves became a major part of the Board's functions. From 1882 onwards the Board increasingly intruded into the lives of the Aboriginal communities of NSW, dramatically increasing the regulations and limitations governing their lives. In the early decades of the 20th century the Board successfully pushed for legislative power to control the lives of Aboriginal people and, in particular, Aboriginal children. In 1909 the first protection legislation was enacted, the Aborigines Protection Act 1909. A system of protective segregation was adopted from the 1880s onwards, with Aboriginal people being put on reserves and managed stations which were generally away from white society. Medical care, ration items such as agricultural implements and blankets were distributed. In north-eastern NSW 126 reserves were established between 1883 and 1971, more than half of these in the Clarence and Macleay valleys (Rich 1990:25).

Most of the reserves were established between 1880 and 1920, although a number were later revoked, and others have been created since the 1950s. The size of the reserves varied, for example Emigrant Creek near Ballina was 28 acres, and Terania Creek was 39 acres, however others were larger, such as Kyogle at 115 acres (McGuigan 1984).

Aboriginal families moved to Cabbage Tree Island in the 1880s in response to the pressures of European settlement on their traditional country. Cabbage Tree Island is located on the Richmond River between the towns of Wardell and Broadwater. The community on Cabbage Tree Island established sugar cane farms and fruit and vegetable gardens there (Gahan 2004:25). Families on the island managed to retain traditional knowledge despite the influence of European settlement. In 1911, much of the autonomy on the island was taken away when the Aborigines Protection Board of NSW appointed a manager and a matron to the island. At this time a school and manager's residence were built. The Department of Education established a school at Cabbage Tree Island in 1893 in response to the wish of parents at Wardell Public School to exclude Aboriginal children (Gahan 2004:51). This exclusion policy continued up until the 1960s.

The settlements which developed at these reserves, including associated facilities, cemeteries and places of spiritual importance, became very important to the people who lived there. Creamer (1984) found that settlement cemeteries held particularly strong social values.

### 3.1.14. Migrant contributions to the community

The major migrant influences in the project region can be traced to Italian and Chinese migrant workers. The first example relates to the New Italy Settlement, south of Woodburn and the second is the migrant itinerant Chinese who worked throughout the region.

Settlement of the land which has become known as New Italy started with an ill-fated migration scheme from Italy in 1880. The Italians were part of a scheme initiated by Charles De Bruel, the Marquis de Ray, to establish a colony at Port Breton, New Ireland (Papua New Guinea). In July 1880, 246 people made the journey to New Ireland (Pesman and Kevin 1998:2). The poor preparation, climate and inadequate food resulted in the deaths of 48 people. The migrants requested assistance from a ship which arrived as part of an earlier expedition to New Ireland and were subsequently transported to Noumea and then to NSW (Gardiner and Cotter 2002:12). The *James Patterson* arrived in Sydney in 1881 with 217 Italian migrants on board. The NSW Government offered asylum to these migrants, although it refused their requests to remain together as a community, stipulating that they should serve as indentured labourers for one year before they could establish their own community.

In early 1882, seven of the migrant families applied for a selection of land close to a creek on the South Woodburn-Chatsworth Island coach route (Clifford 1889:4). The original land selected was 'about 3 miles square ... of fifty-three selections, ranging from 40-120 acres occupied by about 30 families' (Clifford 1889:7). Within a year this number had grown to 19 families and by 1887 a school, post office, tavern and church had been established (Pesman and Kevin 1998:2).

The settlement at New Italy was probably the first Italian farming community in Australia (Pesman and Kevin 1998:21). In the early years of the settlement the community had to diversify their interests to maintain income and productivity of the land. This included harvesting timber for railways sleepers, production of sugar cane, tobacco, maize, oats and barley, growing of fruit trees including lemons, apples and stone fruits and grapes and vegetables (Gardiner and Cotter 2002:15). Silk farming was also commenced in 1890, with the clearing of more land and the planting of mulberry trees. Silk was successfully produced at New Italy. The New Italy Settlement prospered until the 1920s and then gradually declined. Most of the residents moved to Lismore where a larger Italian community was established by this time.

The historical significance of the New Italy Settlement is recognised by a listing on the State Heritage Register (no 1648). The individual components of the site within this listing include the community hall, monuments, memorials, the Museum and the church and school sites. Associated items which have been identified outside the State Heritage Register curtilage include a memorial, three stone-lined wells, various fruits trees (in particular mango, citrus and guava trees) as well as archaeological remains of buildings.

Much of the evidence of the settlement, such as pise houses, wells, drainage lines, agricultural contours, fence posts, exotic plantings, orchards and grape vines have been damaged or buried beneath soil and native vegetation. However 10 discrete archaeological sites have been identified in the *New Italy Settlement Conservation Management Plan* (Gardiner and Cotter 2002) including: the school and residence, the church, Angelo Piccoli's house, the wine shop, the Post Office and store, stockyards, three wells, the Vine Haven property, a house site on Mahogany Rd and the Park of Peace (Gardiner 2007:35).

Chinese migration in the 19th and 20th centuries had a significant impact on the development of northern coastal NSW, both economically and socially. According to Williams (1999:1) in his thematic history of Chinese settlement in NSW the uniqueness of the Chinese contribution to the heritage of NSW is due to different factors including the '...value placed on maintaining links with the villages of origin, the predominance in early migration of men over women and the experience of prejudice and anti-Chinese legislation'.

The cessation of convict transportation in the 1840s resulted in an increasing demand for labour and large numbers of Chinese people arrived as indentured labourers to work as shepherds and irrigation experts for private landowners (Williams 1999: 4). Between 1848 and 1853, over 3,000 Chinese indentured workers arrived via Sydney for employment in the NSW countryside.

The first gold rushes in NSW in the 1850s ended the need for Chinese people to work as indentured labourers, as they now had the freedom to head for the gold fields and make their own way. Initially the larger gold fields in Victoria attracted the majority of Chinese workers, however anti-Chinese legislation introduced in Victoria in 1859 resulted in thousands of miners moving to NSW (Williams 1999:5). The unreliability of gold mining as a means of income soon resulted in Chinese people diversifying their occupations, with a bias towards more service-oriented employment. Chinese people became merchants, hawkers and fishermen in the 1860s and 1870s. From the 1890s Chinese people were scrub cutters, interpreters, cooks, tobacco farmers, market gardeners, cabinet makers, storekeepers and drapers (Williams 1999:6). Most of these occupations were of a highly transient nature throughout NSW and Queensland.

Gambling and opium smoking were very popular pastimes, and no doubt helped relieve the loneliness of many individuals. Opium smoking had been common in China for many centuries before European trade in cheaper, higher quality opium varieties helped to make it a major social problem (Williams 1999:52). In NSW gambling had been an illegal but much practised leisure pursuit since the colony's foundation. While Chinese people were by no means the only practitioners, general hostility towards them ensured that their involvement had a high profile.

Chinese people were present in the north coast region from the late 1840s, first as indentured pastoral workers on newly established sheep and cattle properties. Thousands of Chinese men migrated to the upper Clarence region in the 1850s in search of gold. There were at least six Chinese mining settlements, referred to as Chinatowns. During this time they built extensive stone and wooden structures, for washing alluvial gold. They operated a large treadmill water wheel, and at Tooloom, west of Kyogle, they constructed a race for diverting river water that was 20 miles long (Far North Coaster 2009).

From the mid-1880s North Lismore became a Chinese enclave, with the men mainly growing fresh fruit and vegetables to supply the European settlers. According to Theresa Gilroy, 'There was a Chinese store where a pub now stands, there were fruit and vegetable shops, fancy stores, herbalist and a cabinet maker right here in North Lismore. There were up to 150 Chinese men living around here between 1885 and 1905' (Far North Coaster 2009).

During the field survey for this assessment, two areas potentially associated with Chinese gambling were recorded. These areas are identified today by large plantings of bamboo. These areas may also be associated with the community on Cabbage Tree Island where gambling was not allowed. Aboriginal men from Cabbage Tree Island would go to where the Chinese would set up gambling tables. People would travel between the island and various gambling sites including those near Wardell (Jali LALC Site Officers, pers comm, 27 August 2010).

## 3.2. Physical context

### 3.2.1. Historical heritage register search

Historical heritage items or places identified on the relevant historical heritage registers and schedules within or adjacent to the project boundary are presented in Table 3-3.

There are 16 heritage items registered on heritage databases, mostly local environmental plans. Two of these items are listed on the State Heritage Register - New Italy Settlement and High Conservation Value Old Growth Forest. No sites or places within the project boundary were listed on the World Heritage List, Commonwealth Heritage List or National Heritage List and therefore no referral under the EPBC Act for matters of national environmental significance is required. There are no historic shipwrecks recorded on the National Shipwrecks Database within the project boundary.

There are no recorded heritage items on any heritage databases or lists outside of the project boundary within the proposed ancillary sites.

**Table 3-3: Results of historical heritage register searches**

| Project section | Place name | Register | Location | LGA | Heritage significance |
|---|---|---|---|---|---|
| 7 | New Italy Settlement Landscape | State Heritage Register 1648 | 2 New Italy Road, New Italy via Woodburn. Lot 2 DP616005, Part Lot 72 and Part Lot 73 DP755609. | Richmond Valley | State |
| | | Richmond Valley Local Environmental Plan 2012, site IDs I145, I147, I148, I149, I150, A5, A7.<br>Richmond Valley Local Environmental Plan 2012, section 6.4, Historic New Italy Village Area. | I145 – Cypress Road Stone-lined Well, Cypress Road, New Italy. Lot 25 DP755610.<br>I147 – Bazzo's Well, Forest Road, New Italy. Lot 59 DP755609.<br>I148 – New Italy Settlement (incl. Museum complex and former school site), 2 New Italy – Swan Bay Road, New Italy. Lot 2 DP616005, Lot 72 DP755609.<br>I149 – Roder's Stone-lined Well and Orchard, Pacific Highway, New Italy. Lot 97 DP755609.<br>I150 – Memorial and Stone-lined Well, Cnr Swan Bay – New Italy Road and Pacific Highway, New Italy. Lot 1 DP207390.<br>A5 – St Peter's Church, former, and Wells, 40 Forest Road, New Italy. Lot 37 DP755609.<br>A7 – Pezzuti's Wine Shop, former, Moonim-New Italy Road (corner Swan Bay – New Italy Road), New Italy. Lot 30 DP755609.<br>Historic New Italy Village Area,<br>New Italy. Figure 5-1. | | Local |
| 7 | Vineyard Haven New Italy Settlement | State Heritage Register 1715<br>Richmond Valley Local Environmental Plan 2012, site ID I146 | 1 Forest Rd, New Italy via Woodburn.<br>Part Lot 2 / DP828347 | Richmond Valley | State |
| Multiple | High Conservation Value Old Growth Forest | State Heritage Register 224 | Numerous locations in North East NSW | Various | State |

| Project section | Place name | Register | Location | LGA | Heritage significance |
|---|---|---|---|---|---|
| 3 | Tyndale Residence | Clarence Valley Local Environmental Plan 2011, site ID I389 | 2860 Pacific Highway, Tyndale.<br>Lot 2 DP586049 | Clarence Valley | Local |
| 4 | Townsend Residence | Clarence Valley Local Environmental Plan 2011, site ID I377 | 3 Jubilee Street, Townsend.<br>Lot 1 DP501255 | Clarence Valley | Local |
| 4 | Maclean Punt and former Ashby ferry (both stationary) | Clarence Valley Local Environmental Plan 2011, site ID I158 | Ferry Park, Corner of Cameron St and Pacific Highway, Maclean.<br>Lot 434 DP823599 | Clarence Valley | Local |
| 4 | Tyndale Shed and Cane Barracks | Clarence Valley Local Environmental Plan 2011, site ID I387 | 18 Gallaghers Road, Tyndale.<br>Lot 2 DP210874 and Lot 19 DP1007618 | Clarence Valley | Local |
| 5 | Harwood School and School Residence | Clarence Valley Local Environmental Plan 2011, site ID I139 | 9 Morpeth Street, Harwood.<br>Lot 1 DP818005 | Clarence Valley | Local |
| 5 | Harwood Tram tracks | Clarence Valley Local Environmental Plan 2011, site ID I141 | Old Pacific Highway road reserve, Harwood. | Clarence Valley | Local |
| 5 | Harwood Water Brigade Hall | Clarence Valley Local Environmental Plan 2011, site ID I143 | River Street, Harwood.<br>Lots 168 and 169 DP751373, Reserve 44087 | Clarence Valley | Local |
| 5 | River Street Trees, Harwood | Clarence Valley Local Environmental Plan 2011, site ID I145 | River Street road reserve, Harwood. | Clarence Valley | Local |
| 5 | Harwood War Memorial | Clarence Valley Local Environmental Plan 2011, site ID I144 | River Street Road reserve, Harwood. | Clarence Valley | Local |
| 5 | Residence, ‘Highfield’ | Clarence Valley Local Environmental Plan 2011, site ID I158 | 35 James Creek Road James Creek.<br>Lot 30 DP1136907 and Lot 31 DP1136907 | Clarence Valley | Local |
| 5 | Harwood Heritage Conservation Area | Clarence Valley Local Environmental Plan 2011 | Northern side of Clarence River at Harwood | Clarence Valley | Local |
| 5 | James Creek Residence | Clarence Valley Local Environmental Plan 2011, site ID I161 | 580 Yamba Road, James Creek.<br>Lot 1811 DP1079120 | Clarence Valley | Local |
| 8 | Woodburn Slaughterhouse | Richmond Valley Local Environmental Plan 2012, site ID I166<br>NSW Roads and Maritime Services Register, ID 4311595 | 204 Tuckombil Road, Trustrums Hill.<br>Lot 15 DP864108 | Richmond Valley | Local |

### 3.2.2. Previous historical and archaeological assessments in the project boundary

Previous historical heritage and archaeological assessments in the project boundary provide relevant information relating to the nature and extent of historical heritage and archaeological sites and places. Previous studies are summarised below, with results for the project boundary summarised in Table 3-4. A detailed analysis was undertaken to identify any information and knowledge gaps in these assessments undertaken to date. The historical heritage assessments outlined below have identified historical heritage sites, which are not currently listed on heritage registers. These are summarised in Table 3-4. Curtilage data for these sites, where available, are included in Appendix A.

#### Council studies

Ballina Shire Council commissioned a community-based heritage study for the Wardell area (Gahan 2004). The study used guidelines published by the NSW Heritage Office, Community-Based Heritage Studies: A Guide (2007). The study presented a detailed thematic history of the Wardell region comprising the township of Wardell and other localities including Bagotville, Cabbage Tree Island, Coolgardie, East Wardell, Empire Vale, Keith Hall, Pimlico, Meerschaum Vale, Patch's Beach and South Ballina. The study resulted in the assessment of 57 items or places of state or local significance and the recommendation for inclusion of these items in the Ballina Shire Local Environmental Plan.

Similarly, Clarence Valley Council prepared a community-based heritage study for the Maclean area (Gardiner 2006). This included the areas of Harwood, Ashby, Tyndale, Iluka, Yamba, Brooms Head and Maclean. The study provides a thorough listing of known historical heritage sites or places within the Maclean region as well as defining several conservation areas to be recognised for their heritage significance as a landscape, rather than as individual items.

Richmond Valley Council have also prepared a community-based heritage study (Gardiner 2007) which includes New Italy, Woodburn, Casino and other areas. Recommendations arising from this study included an archaeological conservation area for the New Italy Settlement.

These studies emphasise a community-based approach by undertaking significant local consultation to develop a schedule of heritage items which can then be adopted into the next version of the Local environmental plan.

#### Route development studies

The NSW Roads and Maritime Services commissioned several studies for each previous development project between Woolgoolga and Ballina. The results of these are discussed below.

Kuskie and Carter (2007) completed an assessment in two phases for Woolgoolga and Wells Crossing; an initial predictive study to assist with the selection of feasible route options, followed by a more detailed investigation of the preferred route. The detailed assessment was undertaken with reference to the historical and environmental context of their study area and surrounding locality, including searches of relevant national, state and local heritage registers and planning instruments, followed by a comprehensive field survey of the preferred route. A total of nine potential non-Aboriginal heritage items were identified, none of which are presently listed on any heritage registers or planning instruments. The significance of these items was assessed in accordance with the Heritage Branch of the Office of Environment and Heritage criteria. Two items (house, sheds and stockyards near Milleara/Halfway Creek and service station, Halfway Creek) are of local

heritage significance and relate to the expansion of settlement and provision of services along the highway.

Navin Officer (2009b) reviewed a range of documentation to assess archaeological and historical information for Wells Crossing to Iluka Road. Their literature review was used to determine if known historical sites were in their study area, to facilitate site prediction on the basis of known regional and local site patterns, and to place the area within an archaeological and heritage management context. Navin Officer's review included searches of heritage registers and schedules, local histories, and archaeological reports to identify heritage sites within the project boundary. The heritage-listed items identified in the study corridor were inspected in the field. Additional potential heritage sites were identified by the local community, from topographic maps and through driving the existing highway and secondary roads within their study area. The 2009 assessment concluded that the preferred route would affect two potential historical heritage sites:

- A 19th century private residence, formerly the Harwood Convent, included in a proposed Harwood Heritage Conservation Area in the Maclean Community-Based Heritage Study (Gardiner 2006)
- The Harwood Bridge, identified in the Maclean Shire Community-Based Heritage Study (Gardiner 2006).

These two sites were identified as being of local heritage significance by the authors, and while reference was made to the 'Heritage Branch methodology and criteria for cultural heritage significance' a specific methodology was not presented. Detailed assessment against each significance criteria was not undertaken by Navin Officer (2009b).

Connell Wagner (2008) completed the non-Aboriginal heritage assessment for Iluka Road to Woodburn. This assessment aimed to identify and describe any potential items having historical heritage significance, which may be affected by upgrade of the Pacific Highway from Iluka Road to Woodburn. The items identified were documented and described in terms of their significance and their relationship to the project. The assessment identified that the following sites within the project boundary are listed on the NSW State Heritage Register:

- The museum complex within the New Italy Settlement
- High Conservation Value Old Growth Forest.

Connell Wagner (2008) also identified around 1,350 hectares of the original New Italy settlement area (which was under discussion for nomination for inclusion on the State Heritage Register) and is now included in the Richmond Valley Local Environmental Plan 2012, as the Historic New Italy Village Area. No unlisted heritage sites were identified in their assessment.

Heritage Concepts (2005) undertook a detailed study for the various route options for Woodburn to Ballina. This included searches of available heritage registers and relevant previous reports and publications. Their study concluded that there is potential for unregistered heritage or archaeological sites in their study area. They identified that previous consultants' studies had concentrated mainly on issues of maritime heritage, focussing on the Richmond River. They highlighted the importance of the River for trade, transportation, and the growth of towns and agricultural settlements. They also identified however the potential for other items to be found within the study area that would have either archaeological or cultural heritage significance. It was found likely that many unidentified items, associated with important early agriculture and other industries be located away from the towns. These potential constraints were investigated by physical survey of the study area by Heritage Concepts, the aim of which was to assess the

potential historical heritage and archaeological constraints. Their study identified three potential heritage items not already listed on any register or schedule relevant to the project boundary:

- Byrne property, Broadwater
- Meerschaum Vale Brickworks site, Wardell
- 'Stonehenge' property, Wardell.

The 'Stonehenge' property and the Meerschaum Vale Brickworks site were identified by Heritage Concepts (2005) as being of local significance, based on the significance level identified in previous community heritage studies, while the Byrne property was only identified as being of potential heritage significance. Detailed significance assessment against NSW Heritage Branch's heritage significance criteria was not undertaken by Heritage Concepts (2005).

Navin Officer (2009a) undertook a detailed study for the Glenugie upgrade of the Pacific Highway. One historical heritage site was identified during the study as a result of register searches, historical research and field survey. The unlisted North Coast Railway branch tramway line situated in the southern end of the Glenugie upgrade study area is now situated within the project boundary for the present assessment. Navin Officer (2009a) undertook a detailed significance assessment of the branch tramway line in accordance with NSW Heritage Branch (1996) methodology identifying the site as of local heritage significance.

### Other studies

Heritage Concepts (2007) undertook a heritage impact assessment as part of the Review of Environmental Factors for the construction of the Franklins Road Heavy Vehicle Inspection Site on the Pacific Highway at Glenugie. This assessment identified the remains of the Six Mile Tick Gate at this location, which falls within the project boundary, as being of local heritage significance. Heritage Concepts (2007) undertook a detailed significance assessment with reference to unspecified NSW Heritage Branch (2001) guidelines, the Australia ICOMOS (2000) Burra Charter and the *NSW Heritage Act 1977*.

**Table 3-4: Unregistered historical heritage places in the project boundary identified from previous studies.**

| Project section | Place name | Location | Description | LGA | Significance |
|---|---|---|---|---|---|
| 1 | House, sheds and stockyards, Milleara | Lot 9 DP707325 | Farm complex comprising sheds and weatherboard cottage. Also items of movable heritage (farm machinery) | Clarence Valley | Local |
| 1 | Tree stumps, Milleara/Halfway Creek | Lot 7 DP707325 and Lot 61 DP751368 | Old tree stump with spring board cuts for loggers | Clarence Valley | Local |
| 1 | Schoolhouse, Halfway Creek | Lot 15 DP879175 | Weatherboard schoolhouse, now a dwelling | Clarence Valley | N/A |
| 1 | Stockyard and sheds south of Corindi River | Lot 51 DP851056 | Post and rail stockyards and timber shed | Coffs Harbour | N/A |
| 2 | Survey mark, Halfway Creek | Lot 7300 DP1144709 | Tree stump with survey mark ‘223’ | Clarence Valley | N/A |
| 2 | Service Station, Halfway Creek | Lot 411 DP883976 | Former Halfway Creek Wine Bar/Restaurant and coach service station, now associated with a modern service station | Clarence Valley | Local |
| 2 | Bridge and culvert, Halfway Creek | Within Pacific Highway road reserve, south of Halfway Creek | Bridge remains and culvert at Halfway Creek | Clarence Valley | N/A |
| 2 | Stockyards, north-west of Lemon Tree Road, Halfway Creek | Lot 1 DP558503 | Timber post and rail stockyards | Clarence Valley | N/A |
| 2 | Six Mile Tick Gate Remains, Glenugie | Lot 20 DP1123940 | Structural and other remains of the 1930s-1970s tick gate operations | Clarence Valley | Local |
| 2 | North Coast Railway Branch Tramway, Franklins Road, Glenugie | Lot 74 DP751380, road reserve | Remnants of 1915 tramway formation | Clarence Valley | Local |
| 5 | Convent, Harwood | 12 River St Harwood | 19th century house in Harwood Conservation Area | Clarence Valley | Local |
| 5 | Harwood Bridge, Harwood | Bridge over Clarence River at Harwood | Steel truss bridge built in 1966 | Clarence Valley | Local |
| 9 | Byrne Property, Broadwater | Lot 6 DP 1043232 | Former local brickworks and farm site | Ballina | Local |

| Project section | Place name | Location | Description | LGA | Significance |
|---|---|---|---|---|---|
| 10 | Meerschaum Vale Brickworks, Wardell | Approximate location is Lot 7 DP866508 | Possible location of former brickworks | Ballina | Local |
| 10 | 'Stonehenge' Property, Wardell | Lot 2 DP543525, Via Lumleys Lane, Wardell | Residential property | Ballina | Local |

N/A indicates that the site does not meet the criteria (NSW Heritage Office 2001) for state or local heritage significance.

## 3.3. Predictive model for historical heritage sites

Based on the above synthesis, the types and distribution of non-Aboriginal historical heritage sites within the project boundary may consist of sites associated with:

- Exploration, such as survey markers, shipwrecks, blazed trees
- Cedar getting, such as camp sites, huts (standing buildings or ruins), sawpits, remnant sawn logs, sawmills, trees marked with holes for planks and Big Scrub remnants
- Farming and pastoral activities, such as homesteads, sheds, barns, farm machinery, stock routes, fences or fencelines and sugar mills
- Water management infrastructure, such as canals, channels, regulator structures, wells
- Mining and quarrying, such as diggings, spoil heaps, alluvial traces, quarries (often disguised as dams) and kilns
- Aboriginal sites, such as contact sites, reserve sites, cemeteries and building remains
- Migrant influence, such as domestic artefact scatters, house remains, wells, fences, exotic trees, agricultural contours in landscape, Chinese temples, irrigation ditches, gardens, bamboo clumps, hearths, ovens and graves
- Road and river transport, such as early roads, bridges and associated structures, coach routes, timber or stone jetties and wharves, dry docks, cane derricks, timber or sugarcane tramways and tick gates
- Towns and villages, such as churches, schools, memorials and residential properties.

A discussion of the predictive model as it applies to each section of the project is presented below. Predictive models such as this can be used as a guide, however should not be used in lieu of field survey or detailed research.

### 3.3.1. Section 1 – Woolgoolga to Halfway Creek

Land use within Section 1 ranges from heavily wooded state forest to gently undulating farm land. The southern part of the section from near Arrawarra River to the Corindi River is under increasing pressure from settlement and residential land use heading north from Coffs Harbour.

The southern portion of the project boundary traverses forested undulating low coastal hills and flats. The Corindi River and its associated floodplain, currently used for small farm holdings, are traversed at Corindi. North of the Corindi River the project boundary diverges inland to the north-

west through forested hills and low Dirty Creek Range. Closer towards Halfway Creek the project boundary tends to be densely forested with re-growth.

Historical heritage site types within this section are likely to include sites associated with exploration or early survey; timber harvesting such as marked trees; farming and pastoral activities, such as homesteads, sheds, barns, farm machinery, stockyards, fences or fencelines; and Aboriginal sites, such as contact sites, reserve sites, massacre sites and burials. Sites associated with transport infrastructure such as roads and bridges are also likely.

Areas of greater potential for historical heritage sites may include areas within close proximity to fresh water; areas with hill top positions with good views; areas associated with known historical homesteads and areas alongside historical roads.

Areas of lesser potential for historical heritage sites may include areas of forested re-growth, where prior logging has occurred and original remnant forest or timber milling sites are less likely to remain.

### 3.3.2. Section 2 – Halfway Creek to Glenugie upgrade

Land use within Section 2 generally consists of heavily wooded re-growth areas interspersed with small pastoral areas or hobby farms. Landforms are generally undulating low hills and flats with several small creeks crossing the project boundary. The Newfoundland and Glenugie state forests cover much of the northern portion of the section. Halfway Creek runs parallel to the project boundary for much of the section. The northern part of the section is characterised by low undulating hills and slopes, mostly within state forest.

Historical and archaeological site types within this section may include sites associated with: exploration or early survey; farming and pastoral activities, such as homesteads, sheds, barns, farm machinery, stockyards, fences or fencelines and transport infrastructure such as roads, tick gates and bridges.

Areas of greater potential for historical heritage sites may include areas within close proximity to fresh water; areas with hill top positions, with good views; areas associated with known historical homesteads and areas alongside historic roads.

Areas of lesser potential for historical heritage sites may include areas of forested re-growth such as Glenugie and Newfoundland state forests, where prior logging has occurred and original remnant forest or timber milling sites are less likely to remain.

### 3.3.3. Section 3 – Glenugie upgrade to Tyndale

Land use in the southern part of Section 3 consists of heavily wooded re-growth areas interspersed with small pastoral areas or hobby farms on undulating low hills. In the southern part of the section the project boundary follows the existing Pacific Highway alignment and at the Glenugie interchange the project boundary branches off to the east through the Glenugie State Forest and then onto the gently sloping farmland and waterways of the Pillar Valley.

From Pillar Valley, the project boundary proceeds north to Tyndale along the basal to mid slopes of the Coast Range. The topography in this section is typically spurs and slopes extending westward, fringing the Clarence River floodplain and its associated swamps, interspersed with creeks.

Historical heritage site types within this section may include sites associated with: exploration or early survey; farming and pastoral activities, such as homesteads, sheds, barns, farm machinery, stockyards, fences or fencelines; road and water transport infrastructure such as roads, tick gates, bridges and jetties and water management infrastructure.

Areas of greater potential for historical heritage sites may include areas within close proximity to fresh water; areas with hill top positions, with good views; areas alongside historical roads and areas immediately adjacent to major traversable waterways.

Much of the landscape of the central part of this section (Pillar Valley region) includes areas which have been previously logged and are now cleared as agricultural land. That combined with the low lying areas and frequent waterways, indicate that the potential for historical sites, other than those associated with water management and water transport, is low.

Areas of lesser potential for historical heritage sites may include areas of forested re-growth such as Glenugie State Forest, where prior logging has occurred and original remnant forest or timber milling sites are less likely to remain.

### 3.3.4. Section 4 – Tyndale to Maclean

From Tyndale the project boundary follows the South Arm of the Clarence River, on the Clarence River floodplain. The terrain is mainly undulating, elevated above the Clarence River. The section is characterised by farmed land, mostly sugar cane or grazing land for cattle. Much of this has suffered disturbances from road construction, clearing, ploughing, and the construction of dwellings and their associated infrastructure. Little of the original vegetation remains in this section of the project boundary.

Historical heritage site types within this section may include sites associated with: exploration or early survey; farming and pastoral activities, such as homesteads, sheds, barns, farm machinery, stockyards, fences or fencelines; road and water transport infrastructure such as roads, bridges and jetties and water management infrastructure.

Areas of greater potential for historical heritage sites may include areas within close proximity to fresh water; areas with hill top positions, with good views; areas alongside historical roads and areas immediately adjacent to major traversable waterways. As much of the landscape in this section has been significantly disturbed, archaeological sites are less likely to be present and other historical heritage sites are more likely to consist of those within established townships or near historical homesteads.

Areas of lesser potential for historical heritage sites may include areas of significant ground disturbance, such as those under previous or current sugar cane cultivation or areas subject to frequent inundation.

### 3.3.5. Section 5 – Maclean to Iluka Road, Mororo

From the outskirts of Maclean the project boundary traverses the Clarence River floodplain over a gently undulating landscape, characterised by farmed land, mostly sugar cane or grazing land for cattle. The project boundary crosses several small creeks including James Creek and water management infrastructure such as drainage canals. Much of this has suffered disturbances from road construction, clearing, ploughing, and the construction of dwellings and their associated infrastructure. Little of the original vegetation remains in this section of the project boundary.

Historical heritage site types within this section may include sites associated with: exploration or early survey; farming and pastoral activities, such as homesteads, sheds, barns, farm machinery, stockyards, fences or fencelines; towns and villages; road and water transport infrastructure such as roads, bridges and jetties and water management infrastructure.

Areas of greater potential for historical heritage sites may include areas within close proximity to fresh water; areas with hill top positions, with good views; areas alongside historical roads and areas immediately adjacent to major traversable waterways. As much of the landscape in this section has been significantly disturbed, archaeological sites are less likely to be present and historical sites are more likely to consist of those within established townships or near historical homesteads.

Areas of lesser potential for historical heritage sites may include areas of significant ground disturbance, such as those under previous or current sugar cane cultivation or areas subject to frequent inundation.

### 3.3.6. Section 6 – Iluka Road to Devils Pulpit upgrade

From the Iluka Road interchange the project boundary travels along the existing Pacific Highway through the Mororo State Forest and other heavily forested areas. The project boundary crosses the Tabbimoble Creek. The project boundary extends on either side of the existing Pacific Highway and as such, much of the project boundary would have been previously disturbed during road construction, clearing, ploughing, and the construction of dwellings and their associated infrastructure. Little of the original vegetation remains.

Historical heritage site types within this section may include sites associated with: exploration or early survey; farming and pastoral activities, such as homesteads, sheds, barns, farm machinery, stockyards, fences or fencelines; road transport infrastructure and sites associated with non-British migrant influences.

Areas of greater potential for historical heritage sites may include areas with hill top positions, with good views; areas alongside historical roads and areas immediately adjacent to major traversable waterways. As much of the landscape in this section has been significantly disturbed by road construction, archaeological sites are less likely to be present and other historical heritage sites are more likely to consist of those within established townships or near historical homesteads.

Areas of lesser potential for historical heritage sites may include areas of significant ground disturbance, such as those under previous or current cultivation and areas of road construction disturbance.

### 3.3.7. Section 7 – Devils Pulpit upgrade to Trustrums Hill

From the end of the Devils Pulpit upgrade the project boundary travels along the existing Pacific Highway through the Tabbimoble and Double Duke state forests and the Tabbimoble Swamp Nature Reserve and other heavily forested areas. In the north of the section, the forested areas clear and the landscape is characterised by small farms. The project boundary extends on either side of the existing Pacific Highway throughout this section and as such much of the project boundary would have been previously disturbed during road construction, clearing, ploughing, and the construction of dwellings and their associated infrastructure. Little of the original vegetation remains.

Historical heritage site types within this section may include sites associated with: exploration or early survey; farming and pastoral activities, such as homesteads, sheds, barns, farm machinery, stockyards, fences or fencelines; road transport infrastructure and sites associated with non-British migrant influences.

Areas of greater potential for historical heritage sites may include areas with hill top positions, with good views; areas alongside historical roads and areas immediately adjacent to major traversable waterways. As much of the landscape in this section has been significantly disturbed by road construction, archaeological sites are less likely to be present and historical sites are more likely to consist of those within established townships or near historical homesteads.

Areas of lesser potential for historical heritage sites may include areas of significant ground disturbance, such as those under previous or current cultivation and areas of road construction disturbance.

### 3.3.8. Section 8 – Trustrums Hill to Broadwater National Park

At the start of the section, the project boundary veers east away from the existing Pacific Highway alignment, and across the Tuckombil Canal then through cultivated farmland. Much of the project boundary in this section is through a landscape not previously disturbed by road construction.

Historical heritage site types within this section may include sites associated with: exploration or early survey; farming and pastoral activities, such as homesteads, sheds, barns, farm machinery, stockyards, fences or fencelines; mining and quarrying sites; road transport infrastructure and sites associated with non-British migrant influences.

Areas of greater potential for historical heritage sites may include areas with hill top positions, with good views; areas alongside historical roads and areas immediately adjacent to major traversable waterways.

### 3.3.9. Section 9 – Broadwater National Park to Richmond River

The start of this section is characterised by the heavily wooded Broadwater National Park. The project boundary then travels through cleared farmland. Much of the project boundary extends through areas not previously subject to major disturbance. However, the likelihood of historical sites appears to be low, based on the historical and current land use being predominantly agricultural. In addition, much of the landscape was traditionally subject to major and frequent floodplain inundation, creating an unlikely landscape for settlement.

Historical heritage site types within this section may include sites associated with: exploration or early survey; farming and pastoral activities, such as homesteads, sheds, barns, farm machinery, stockyards, fences or fencelines; and sites associated with non-British migrant influences.

Areas of greater potential for historical heritage sites may include areas with hill top positions, with good views; areas alongside historical roads and areas immediately adjacent to major traversable waterways.

Areas of lesser potential for historical heritage sites may include areas of significant ground disturbance, such as those under previous or current cultivation and areas of road construction disturbance.

### 3.3.10. Section 10 – Richmond River to Coolgardie Road

The start of this section crosses the Richmond River, then travels through cleared farmland heading north and then east.

Much of the project boundary extends through areas not previously subject to major disturbance, however the likelihood of historical sites appears to be low, based on the historical and current land use being predominantly agricultural.

Historical heritage site types within this section may include sites associated with: exploration or early survey; farming and pastoral activities, such as homesteads, sheds, barns, farm machinery, stockyards, fences or fencelines; road transport infrastructure; historical Aboriginal sites and sites associated with non-British migrant influences.

Areas of greater potential for historical heritage sites may include areas with hill top positions, with good views; areas alongside historical roads and areas immediately adjacent to major traversable waterways.

Areas of lesser potential for historical heritage sites may include areas of significant ground disturbance, such as those under previous or current cultivation, areas of road construction disturbance and steeply inclined and wooded areas.

### 3.3.11. Section 11 – Coolgardie Road to Ballina bypass

This section overlaps the existing Pacific Highway for the majority of its extent. Outside the extent of the existing Pacific Highway the surrounding area has been highly disturbed by sugar cane cultivation. The project boundary crosses Duck and Emigrant creeks, both of which have historical associations for cedar getting and exploration. However, the area where the project boundary crosses these creeks has been highly disturbed during previous Pacific Highway construction, and therefore historical sites are highly unlikely.

Historical and archaeological site types are highly unlikely within this section. If present, site types may include sites associated with: exploration or early survey; farming and pastoral activities, such as homesteads, sheds, barns, farm machinery, stockyards, fences or fencelines, road transport infrastructure; sites associated with non-British migrant influences, and Aboriginal sites, such as contact sites and reserve sites related to the Aboriginal reserve that was situated at Emigrant Creek.

Areas of lesser potential for historical heritage sites include areas of significant ground disturbance, such as those under previous or current sugar cane cultivation and areas of road construction disturbance.

## 3.4. Field survey results

A summary of the results of the recent field surveys is presented in Table 3-5.

During the August 2010 field survey, four historical heritage sites were identified:

- Former house site, Property 315, Maclean
- Shed and barn, Property 680, Broadwater
- Bamboo stands, Property 723 and 725, Wardell
- Potential house site, Wardell
- Cemetery reserve, Broadwater

These sites are summarised in Table 3-5 and detailed in Appendix A.

No additional historical heritage sites were identified during the August and October 2011 field surveys.

Targeted site visits to previously identified historical heritage sites in October-November 2011 provided additional detailed recording and information to inform this assessment. Additional components at three sites were identified as a result of the site visits:

- Maclean Cane Barge and Ashby Ferry – sugarcane hoist related to the use of cane barges on the Clarence River identified adjacent to the existing cane barge and ferry

- Old Pacific Highway Tram Tracks – section of tram tracks not previously recorded located near Petticoat Lane, Harwood. Subsequent investigation of aerial imagery indicates it as a continuation of the Old Pacific Highway Tram Tracks
- Shed and barn, Property 680 – shed and barn identified as the former dairy and buttery for the Maloney property. Additional components include early homestead and associated stockyards.

A summary of the results of the site visits is provided in Table 3-5. Detailed descriptions, photographs, curtilage and significance assessments of those properties subject to the site visits are presented in Appendix A.

**Table 3-5: Results of field surveys 2010-2011.**

| Project section | Location | Survey date | Known historical heritage items (prior to survey) | Item's heritage significance | Results of survey |
|---|---|---|---|---|---|
| 1 | Pacific Highway, Milleara, Lot 9 DP707325 | October-November 2011 | House, sheds and stockyard | Local | Detailed research, survey and photographic recording of property. Confirmed and updated general layout and description as presented in Kuskie and Carter 2007. Defined curtilage. |
| 2 | Pacific Highway, Halfway Creek, Lot 411 DP1144709 | October-November 2011 | Service Station Complex, Halfway Creek | Local | Visual inspection from outside property boundary. Confirmed general layout and description as presented in Kuskie and Carter 2007. |
| 3 & 4 | Alignment between Tyndale and Maclean | August 2010 | Tyndale Cane Barracks | - | Majority of landscape is cane fields and subsequently highly disturbed with very low ground visibility.<br><br>Features of the Tyndale Shed and Cane Barracks property (Item 10) include a shed and workers barracks, both of which are outside the area of impact.<br><br>Possible house site (1940s) indicated by concrete slab and well (Item 22).<br>Site not considered to have sufficient heritage significance to fulfil criteria for local or state heritage listing.<br><br>No other historical heritage sites were detected during the survey. |
| 4 | Ferry Park, Maclean, Lot 434 DP823599 | October-November 2011 | Maclean Cane Barge and Ashby Ferry | Local | Detailed survey and photographic recording of property. Confirmed and updated general layout and description as presented in the State Heritage Inventory listing for this heritage item. Defined curtilage.<br>A sugarcane hoist was identified during the survey and is located along the edge of the river between the cane barge and the tourist centre. |
| 5 | South of Yamba Road | August 2010 | None. | Local | Project boundary is highly disturbed. Land is already part of the interchange at Yamba and significant roadworks have disturbed the area.<br>No historical heritage sites detected within the area during survey. |

| Project section | Location | Survey date | Known historical heritage items (prior to survey) | Item's heritage significance | Results of survey |
|---|---|---|---|---|---|
| 5 | Harwood township | August 2010 | None | - | No additional historical heritage sites detected within the area during survey. |
| 5 | North and south of Serpentine Channel | August 2010 | None | - | Majority of landscape is cane fields and subsequently highly disturbed with very low ground visibility.<br>No historical heritage sites detected within the area during survey. |
| 5 | South of Carolls Lane, Chatsworth | August 2010 | None | - | Majority of landscape is cane fields and subsequently highly disturbed with very low ground visibility.<br>No historical heritage sites detected within the area during survey. |
| 5 | Morpeth Street, Harwood | October-November 2011 | Old Pacific Highway Tram Tracks, Harwood | Local | Detailed survey and photographic recording of property. Confirmed and updated general layout and description as presented in the State Heritage Inventory listing for this heritage item. Defined curtilage.<br>During the survey of another heritage item a second section of tracks were located on the road surface between the Harwood Bridge and Petticoat Lane, Harwood. Analysis of maps suggests that these tracks were once connected with the Old Pacific Highway tram tracks and the two are therefore considered to be part of the same site |
| 5 | Pacific Highway, Harwood | October-November 2011 | Harwood Bridge | Local | Confirmed and updated general layout and description as presented in Gardiner 2006. Defined curtilage. |
| 5 | 12 River Street, Harwood, Lot 1 DP230181 | October-November 2011 | Harwood Convent (former) | Local (as part of Harwood Heritage Conservation Area) | Visual inspection of site from outside property boundary. Description and photographs of site taken. |
| 5 | Harwood | October-November 2011 | Harwood Heritage Conservation Area | Local | Inspection of Conservation Area undertaken to establish overall character and context in order to assess individual items within the boundary. |

| Project section | Location | Survey date | Known historical heritage items (prior to survey) | Item's heritage significance | Results of survey |
|---|---|---|---|---|---|
| 7 | 2 New Italy–Swan Bay Road, New Italy, Lot 2 DP616005 | October-November 2011 | New Italy Settlement (State Heritage Register) / New Italy Museum Complex (Local Environmental Plan) | State | Confirmed general layout and description of Museum Complex. Identified State Heritage Register and local environmental plan boundary location as excluding Memorial and Stone-Lined Well. |
| 7 | Cnr Swan Bay – New Italy Road and Pacific Highway, New Italy, Lot 1 DP207390 | October-November 2011 | New Italy Memorial and Stone-lined Well (Local environmental plan) | Local | Detailed description, measurements and photographs taken of Memorial and Stone-lined Well. Additional components include a timber fence and row of large trees delineating boundary between State Heritage Register-listed Museum Complex and Memorial and Well. No obvious evidence of archaeological remains of original mud brick house formerly on the site. |
| 7 | Pacific Highway, New Italy, Lot 25 DP755610 | October-November 2011 | Cypress Road Stone-lined Well (Local environmental plan) | Local | Area in which the well is situated was not surveyed as it is well outside the project boundary. Proposed impact area along the existing highway revealed open forest and thick understory and grasses. No historical heritage sites detected during survey. |
| 7 | Pacific Highway, New Italy, Lot 97 DP755609 | October-November 2011 | Roder's Stone-lined Well and Orchard (Local environmental plan) | Local | Visual inspection from outside property boundary. Well and Orchard identified and location confirmed. No other historical heritage sites were detected during the survey. |
| 8 | North and south of Tuckombil Canal | August 2010 | None | - | Landscape on either side of Tuckombil Canal was highly disturbed during widening works in 1965.<br>No historical heritage sites detected within the area during visual survey from property boundary. |
| 8 | Lot 64 DP 755624 (north of Woodburn) | August 2010 | None | - | Property contains some farming sheds and old trees, possibly related to the farm house located outside the project boundary to the north-west.<br>Property is dissected by a water easement.<br>No historical heritage sites detected within the area during the visual inspection. |

| Project section | Location | Survey date | Known historical heritage items (prior to survey) | Item's heritage significance | Results of survey |
|---|---|---|---|---|---|
| 8 | Woodburn area | August 2010 | None | Local | No survey undertaken.<br>Project boundary is on existing roads and road reserves or in areas likely to been disturbed during previous logging activities. |
| 8 | 204 Tuckombil Road, Woodburn, Lot 15 DP864108 | October 2010 | Woodburn Slaughterhouse | Local | Detailed survey and photographic recording of property. Confirmed and updated general layout and description as presented in the State Heritage Inventory listing for this heritage item. Defined curtilage. |
| 9 | Property at Lumley's Lane | August 2010 | None | - | Project boundary is within a large hilly area.<br>Archaeological site detected on northern part of property (Item 31). Possibly house site.<br>No other historical heritage sites detected during survey. |
| 9 | Property 680 (Lot 61 DP755624)<br>Adjacent to project boundary at chainage 142300 | August 2010 | None | Local | Two historical sheds on property, one large timber and one small concrete block shed (Item 26).<br>Potential for historical heritage sites.<br>Information from property owner indicated location of cemetery reserve (Item 38). No further information provided. No physical evidence of any burials detected during survey. |
| 9 | Evans Head-Broadwater Road, Broadwater (Property 680), adjacent to Lot 5 DP1142669 | October-November 2011 | Maloney Property Dairy and Buttery | Local | Detailed research, assessment, survey and photographic recording of property and features. Brief oral history obtained from property owner's daughter. Confirmed and updated general layout and description which resulted from a field survey undertaken in 2010. Defined curtilage. The 'two historical sheds' identified in the August 2010 survey were identified as a dairy and a buttery. |
| 9 | Pacific Highway, Broadwater, Lot 6 DP1043232 | October-November 2011 | Byrne Property | Local | Confirmed general layout and description as presented in Heritage Concepts (2005, 2006). Recording, photographs and locations taken for previously identified brick-lined well, clay pit, stone quarry and artefact scatter. Additional features identified included a secondary clay pit, two pig-sties, and evidence of more extensive surface artefacts indicative of sub-surface archaeological remains. |

| Project section | Location | Survey date | Known historical heritage items (prior to survey) | Item's heritage significance | Results of survey |
|---|---|---|---|---|---|
| 10 | Property 725, Lot 7 DP866508<br>Adjacent to project boundary at chainage 153000 | August 2010 | Possible location of former Meerschaum Vale Brickworks | Local | Property not surveyed in detail. Owner indicated that there are no brickworks on his property.<br>Aerial imagery shows dam site which is outside the project boundary.<br>Potential for historical heritage sites. |
| 10 | Wardell Road, Wardell, Lot 7 DP866508 (Property 725) | October 2011 | Possible location of former Meerschaum Vale Brickworks | Local | Low ground surface visibility due to tall grasses across entire area. No evidence of historical heritage sites detected. |
| 10 | Property 725 (Lot 7 DP 866508)<br>Adjacent to project boundary at chainage 152600 | August 2010 | None | Local | Large stand of bamboo on road reserve adjacent to property, potential for archaeological remains (Item 30).<br>Potential historical heritage sites. |
| 10 | Property 723 (Lot 172 DP755691)<br>Adjacent to project boundary at chainage 151800 | August 2010 | None | Local | Large stand of bamboo on property, potential for archaeological remains (Item 30).<br>Potential for historical heritage sites. |
| 11 | North of Whytes Lane, Ballina | August 2010 | None | - | No survey undertaken.<br>Project boundary is mainly existing roadway or land on either side of roadway and therefore already highly disturbed. |
| 9 to 11 | Alignment between Woodburn and Ballina (previously unsurveyed properties) | August 2011 | None | - | No historical heritage sites detected during survey. |

| Project section | Location | Survey date | Known historical heritage items (prior to survey) | Item's heritage significance | Results of survey |
|---|---|---|---|---|---|
| 1 to 8 | Alignment between Woolgoolga and Woodburn (previously unsurveyed properties) | October 2011 | None | - | No historical heritage sites detected during survey. |

## 3.5. Physical evidence of earlier Pacific Highway route

Throughout the project boundary, there are many areas where physical remains of earlier routes and infrastructure of the Pacific Highway are present. The following details the physical remains based on the historical changes identified in section 3.1.11 of this report. For parts of the highway where there is no history of changes noted, the existing highway follows the original alignment dating to at least 1928. All information presented is based on information from Laybutt (2011), examination of current aerial imagery and some field survey.

### 3.5.1. Section 1 – Woolgoolga to Halfway Creek

The Wedding Bells deviation was completed in 1985 between Arrawarra Creek and the Corindi Beach turnoff with sections of the original highway either abandoned or used as local roads. Of particular note is a two kilometre section of Eggins Drive, Arrawarra on the eastern side of the existing Pacific Highway.

At Corindi Beach, the original highway route was through the township via Coral Street. The town was bypassed in 1980 including a new bridge across the Corindi River.

North of Corindi, the bridge over Cassons Creek was constructed in 1953, replacing a single-lane timber bridge. The approaches to the bridge were realigned and the original alignment of the highway was then used as a local road (Blackadder Road).

In 1934, a deviation of two miles between Dirty Creek and Halfway Creek was undertaken to eliminate steep grades and improve the alignment. The deviation was constructed to a gravel-surfaced standard. There are no remnants of the original alignment.

In 1987, a 6.5 kilometre deviation across the Dirty Creek Range was completed replacing the 1934 deviation. Remnants of the old alignment are still trafficable and provide access to properties fronting the old highway. Sections of the old alignment include Dirty Creek Road and Falconers Lane, Dirty Creek.

In 2004, the realignment and duplication of 3.4 kilometres of highway from the western end of the Dirty Creek Range deviation to Lemon Tree Road was completed. Some previous sections of the highway still exist along this section of the highway.

### 3.5.2. Section 2 – Halfway Creek to Glenugie upgrade

There is no documentary evidence of major works having been undertaken in this section of the highway other than sealing the highway at some time prior to 1958 and the provision of overtaking lanes in the 1990s.

There are, however, several identified historical heritage sites within section 2 which relate to the Pacific Highway and its earlier routes dating back to the late 19th century. These include road infrastructure - a timber culvert and bridge posts in Halfway Creek west of the existing Pacific Highway bridge (Item 6) and the current road bridge over Wells Crossing dating to 1940 (Item 9). A

blazed tree stump north of Halfway Creek to the west of the existing Pacific Highway (Item 8) is believed to be related to highway construction. The Service Station complex at Halfway Creek (Item 7) is of direct relevance to the ongoing use and support of travellers on the existing route of the Pacific Highway, which still follows the route of the original coach road between Grafton and Bellingen dating to at least 1896.

### 3.5.3. Section 3 – Glenugie upgrade to Tyndale

The five kilometre section between Alipou Creek, South Grafton and the southern end of the Swan Creek deviation near Finlaysons Road, Ulmarra is part of the original gazetted 1928 State Highway No 10. Resurfacing of this section of the highway in cement concrete was commenced in 1929 as unemployment relief work. Resurfacing the gravel road with concrete was carried out until 1939 extending from South Grafton, through Ulmarra to the Ulmarra shire boundary near Tyndale.

A deviation from Alipou Creek to Swan Creek was completed in 1989 replacing the existing narrow, undulating and deteriorating concrete pavement.

The 1.5 kilometre Swan Creek deviation was opened to traffic in 1991. The original alignment of the highway remains as Finlaysons Road and Wyatt Straight, Ulmarra. The original 1930s cement concrete surface remains intact on these roads.

The original gazetted alignment of State Highway No 10 passed through Ulmarra along River Street. In 1929 the alignment was moved one block to the east through Ulmarra and was upgraded to a concrete surface in 1939. The condition and width of this section of the highway through Ulmarra was upgraded in 2001 but remains in use as the existing Pacific Highway.

Previously passing through the township of Cowper, the three kilometre Cowper deviation to the highway was opened in 1993 alongside the Clarence River.

### 3.5.4. Section 4 – Tyndale to Maclean

Between Tyndale and Maclean one of the few bowstring arch bridges in NSW was constructed over Shark Creek in 1935. A deviation on the northern approach of the bridge was constructed in 1956 to improve the alignment and took the highway away from the river. In 1986 a new bridge was constructed over Shark Creek along with a one kilometre deviation on the northern approach. The remains of the original alignment are visible as O'Mara's Lane, Gulmarrad. The 1935 bridge also remains intact.

### 3.5.5. Section 5 – Maclean to Iluka Road, Mororo

When State Highway No 10 was declared in 1928 the route passed through the town of Maclean. Five kilometre north of Maclean the highway crossed the South Arm of the Clarence River via a punt which landed at the end of Morpeth Street in Harwood on the north side of the river. In the mid-1960s construction began on the Harwood Bridge to replace the Harwood Ferry. The southern approach to the bridge was a six kilometre bypass of Maclean constructed at the same time as the

bridge. The Harwood Bridge and Maclean bypass were opened in 1966. Original sections of the Pacific Highway are visible at the northern end of Morpeth Street (Figure 3-6). The Harwood ferry landing was situated at the southern end of Morpeth Street, in the approximate location of the present boat ramp, 200 metres west of the Harwood Bridge.

The Pacific Highway originally followed Chatsworth Road through the village of Chatsworth until 1986 when the two kilometre Chatsworth deviation was constructed.

The North Arm of the Clarence River was originally crossed by punt at Mororo, just downstream of the current bridge location. Construction of the Mororo Bridge was one of the priorities of the unemployment relief scheme during the Depression in the 1930s. The bridge was officially opened in 1935. A new two-lane bridge was constructed downstream from the original steel-truss bridge to provide for southbound traffic in 1993. As part of this project a 1.8 kilometre realignment of the highway was undertaken including a new junction with Iluka Road. Sections of the Old Pacific Highway are still visible east of the existing Iluka interchange.

**Figure 3-6: Remnants of earlier route of Pacific Highway, northern end of Morpeth Street, Harwood, facing north, photo taken by Rachael Loizou on 28 October 2011.**

### 3.5.6. Section 6 – Iluka Road to Devils Pulpit upgrade

The Tabbimoble Creek deviation was completed in 1986, eliminating the previous narrow, winding, flood-prone section of the highway. Remnants of the previous alignment appear to exist east of the existing highway south of Tully Morgan Jacky Bulbin Road, crossing to the west of the existing highway north of this road.

### 3.5.7. Section 7 – Devils Pulpit upgrade to Trustrums Hill

A deviation of a section of highway at 45.7–47.1 miles north of Grafton was carried out in 1969. There is some evidence of the original alignment to the west of the existing highway.

### 3.5.8. Section 8 – Trustrums Hill to Broadwater National Park

Just south of Woodburn, a four kilometre realignment was completed around Gap Road in 1998. The original highway alignment was retained as Tuckombil Road, from Gap Road to Wondawee Way.

Between Woodburn and Broadwater the highway cuts a direct alignment through the Broadwater National Park rather than following a bend in the river through Rileys Hill. The structure of the intersection of the highway and Rileys Hill Road suggests that Rileys Hill Road was the original route of the highway. Documentary evidence indicates that if a deviation of Rileys Hill was constructed it occurred prior to 1950, however currently no other evidence has been found.

### 3.5.9. Section 9 – Broadwater National Park to Richmond River

The section of the existing highway from Broadwater to Wardell has had no major deviations and follows the original route.

### 3.5.10. Section 10 – Richmond River to Coolgardie Road

The section of the existing highway from Broadwater north to Wardell has had no major deviations and follows the original route. At Wardell the previous alignment of the highway included a car ferry taking traffic across the Richmond River between the Pacific Highway and Fitzroy Street. This alignment continued north to near Ballina via River Street, River Drive and Burns Point Ferry Road, with a punt across the Richmond River at Burns Point (which still operates today). This old alignment was subject to flooding and was upgraded to concrete on the Burns Point Ferry Road in the 1930s. The ferry at Wardell was replaced in 1964 with a bridge crossing which saw the highway deviate to the west of Pimlico Road deviating from the Burns Point route. The previous alignment still exists as River Street, River Drive and Burns Point Ferry Road. The 1964 alignment exists as the current Pacific Highway to the northern end of the project boundary.

### 3.5.11. Section 11 – Coolgardie Road to Ballina bypass

The northern part of the 1964 realignment discussed for Section 10 is situated within Section 11. Refer to Section 10 – Richmond River to Coolgardie Road for details.

## 3.6. Ancillary sites

Of the 81 ancillary sites proposed for the project (Figure 3-7 to Figure 3-17), nine were identified as having a medium likelihood of the presence of previously unrecorded or unknown historical heritage sites. These sites would require further investigation through field survey. These measures apply to the sites identified in Table 3-6. Management and mitigation measures are identified in Section 6.1.4 which outline field survey of these nine sites (and significance assessment and impact assessment where heritage items are identified) would be undertaken in parallel with the Environmental Impact Statement, to adequately manage the potential impacts. The assessment of all ancillary sites is presented in Appendix B.

**Table 3-6: Results of desktop assessment of ancillary sites.**

| Project section | Location | Site no | Outside project boundary | Known historical heritage sites | Obvious historical heritage features visible from aerial imagery |
|---|---|---|---|---|---|
| 2 | 17.2 – 17.5 RHS[1] | 1b | Total | No | Yes. Cleared area behind service station which appears to be building foundations. 2004 imagery appears to be stables or similar beside rectangular paddock. |
| 3 | 61.2 – 61.5 RHS | 8 | Total | No | Yes. Possible old sheds/sawmill. |
| 4 | 77.2 – 77.3 LHS[2] | 4c | Partial | No | Yes. Possible modern house, older sheds. |
| 4 | 79.5 – 80.0 LHS | 6 | Partial | No. 500m S of Item 22 (former house site) and <500m south of Item 12 (Ferry/ punt) - no impact. | Yes. Late 19th/early 20th century house, corrugated shed, other outbuildings, farm equipment vehicles - possible significance. Modern brick house, outbuildings and fenced paddocks - not likely significant. |
| 6 | 103.1 to 103.9 RHS | 3a | Partial | No | Yes. Large cleared paddock, some trees, large old shed and other structures. Part of this is in the design boundary and not |

| Project section | Location | Site no | Outside project boundary | Known historical heritage sites | Obvious historical heritage features visible from aerial imagery |
|---|---|---|---|---|---|
| | | | | | identified during previous assessment so may not be significant. |
| 8 | 132.0 – 132.2 LHS | 2b | Partial | No | Yes. Cleared paddock, dam, fences, modern house, possible yards/foundations and historical remains in front paddock/yard. |
| 9 | 136.8 – 137.2 LHS | 1 | Total | No | Yes. Cleared paddock, tree plantation, pond areas, driveway lines with palms, formerly cultivated paddock - not likely significant. Large shed, damaged roof, appears old construction, possible associated house, equipment/vehicles - possible historical heritage. |
| 10 | 156.2 to 156.6 RHS | 4 | Total | No. <1km E of Item 29 (Stonehenge). No impact to site. | Yes. Possible drain part of the late 19th century/early 20th century drainage union drain system. |
| 10 | 158.3 – 158.7 LHS | 6 | Partial | No | Yes. Possible deposits/rubbish piles/house sites and water tanks likely related to pastoralism. |

NOTES: [1] Right Hand Side: to the east of the project boundary
[2] Left Hand Side: to the west of the project boundary

## 3.7. Effectiveness of predictive model

The overall effectiveness of the predictive model in comparison to the results of the survey and identification of historical heritage sites in the project boundary has been high. The types of places identified during the assessment generally matched the site types predicted in the model. The survey of previously unsurveyed areas generally confirmed the predictions made in the model particularly in relation to the level of disturbance and the corresponding absence of historical heritage sites.

A small number of place types were predicted but not found within the project boundary. Across all sections of the project, the predicted exploration and early survey sites were only identified in one section. This reflects the transient and unobtrusive nature of the evidence of historical exploration and survey activities and their subsequent ease of destruction or deterioration. Within individual project sections, specific predicted site types were also not identified in the project boundary, including historical Aboriginal sites (Section 1 and Section 11), water transport and water

management infrastructure sites (Section 3), and mining, quarrying and migrant sites (Section 8). All of the site types predicted for Section 6 failed to be identified. In only one instance was a place type found within the project boundary that was not predicted. A cemetery reserve (associated with the theme of towns and villages) was located in Section 9. Not predicting this site type reflects the general avoidance of towns and villages by the project boundary, and the earlier town footprint of Broadwater which was not developed.

The apparent failure of the model in this small number of instances does not overtly reflect the overall effectiveness of the model, but is more indicative of the specifically narrow nature of the project boundary through a broader landscape. There is still the possibility that the predicted site types exist in these areas but are outside the project boundary.

The effectiveness of the predictive model within each specific project section is detailed below.

### 3.7.1. Section 1 – Woolgoolga to Halfway Creek

Within Section 1, the predicted timber harvesting sites (Item 3 – Marked trees), farming and pastoral sites (Item 1 – Stockyard and sheds, Corindi Beach; Item 2 – House, sheds and stockyards, Milleara) and road transport infrastructure (remnants of earlier routes of Pacific Highway) were identified. The Halfway Creek schoolhouse (Item 4) is outside the predicted site types but is directly related to settlement in the area for farming/pastoral activities.

The predicted site type of exploration and early survey was not identified within this section of the project boundary. Any sites of historical Aboriginal occupation would be discussed in the Aboriginal heritage assessment report for the project.

### 3.7.2. Section 2 – Halfway Creek to Glenugie upgrade

All predicted site types for Section 2 were identified. The predicted exploration and early survey sites (Item 8 – Survey mark, Halfway Creek), farming and pastoral sites (Item 5 – Stockyards, Halfway Creek) and transport infrastructure (Item 6 – Bridge and culvert, Halfway Creek; Item 7 – Service station complex, Halfway Creek; Item 9 – Bridge, Wells Crossing; Item 35 -- Six Mile Tick Gate Remains; Item 36 - North Coast Railway Branch Tramway) were identified. The transport infrastructure sites (except for the Tramway), and also possibly the survey mark are all related to the construction and use of the Pacific Highway and the route as an early coach road.

### 3.7.3. Section 3 – Glenugie upgrade to Tyndale

The predicted site types of farming and pastoral sites (Item 11 – Tyndale residence) and road transport infrastructure (remnants of earlier routes of Pacific Highway) were identified in Section 3. The predicted site types related to exploration and early survey, water transport infrastructure and water management were not identified within this section of the project boundary.

### 3.7.4. Section 4 – Tyndale to Maclean

Within Section 4, the predicted site types of farming and pastoral sites (Item 10 – Tyndale shed and cane barracks; Item 22 – Former house site, Maclean; Item 34 – Townsend residence), road transport infrastructure (remnants of earlier routes of Pacific Highway) and water transport (Item 12 – Maclean Punt and former Ashby ferry) were identified. The predicted site types relating to exploration and early survey and water management were not identified within this section of the project boundary. Survey of previously unsurveyed areas in this section confirmed ground disturbance and the lack of historical heritage potential in areas under previous or current sugar cane cultivation.

### 3.7.5. Section 5 – Maclean to Iluka Road, Mororo

The predicted site types of farming and pastoral activities (Item 13 – 'Highfield' residence, James Creek; Item 14 – James Creek residence; Item 17 – Harwood tramway tracks), towns and villages (Item 15 and 16 – Harwood School and Residence; Item 18 – Harwood Water Brigade Hall; 19 – Harwood War Memorial; Item 21 – Harwood Convent; Item 32 – Harwood Heritage Conservation Area), road transport (Item 20 – Harwood Bridge; Mororo Bridge and remnants of earlier routes of Pacific Highway), and water transport (Item 18 – Harwood Water Brigade Hall) were identified. The predicted site types relating to exploration and early survey were not identified within this section of the project boundary. Survey of previously unsurveyed areas in this section confirmed ground disturbance and the lack of historical heritage potential in areas under previous or current sugar cane cultivation.

### 3.7.6. Section 6 – Iluka Road to Devils Pulpit upgrade

The predicted site types related to exploration/early survey, farming and pastoral activities and non-British migrant influences were not identified within this section of the project boundary. The predicted road transport infrastructure was found in the remnants of earlier routes of the Pacific Highway.

### 3.7.7. Section 7 – Devils Pulpit upgrade to Trustrums Hill

In Section 7, the predicted site types of farming and pastoral activities and non-British migrant community influences were found in the multiple components of the New Italy Settlement Landscape (Items 23 and 24). The predicted road transport infrastructure was found in the remnants of earlier routes of the Pacific Highway. The predicted site types relating to exploration and early survey were not identified within this section of the project boundary.

### 3.7.8. Section 8 – Trustrums Hill to Broadwater National Park

The predicted site type of farming and pastoral activities (Item 25 – Woodburn slaughterhouse) was found in Section 8. The predicted road transport infrastructure was found in the remnants of earlier routes of the Pacific Highway. Sites related to exploration and early survey, mining and quarrying, and non-British migrant influences were not identified in this section of the project boundary. Survey of previously unsurveyed areas of the project section identified disturbance from the construction of the Tuckombil Canal and other water management infrastructure which was not specifically identified as part of the predictive model.

### 3.7.9. Section 9 – Broadwater National Park to Richmond River

The predicted site types of farming and pastoral activities (Item 26 – Maloney property; Item 28 – Byrne property) were identified in Section 9. Components of the Byrne property (Item 28) may also relate to the influence of non-British migrants. The predicted site types relating to exploration and early survey were not identified within this section of the project boundary. A cemetery reserve (associated with the theme of towns and villages) which was not predicted to occur was identified in Section 9. The cemetery reserve was not predicted given the distance of the project boundary from existing settlements in this Section. The location of the cemetery reflects an earlier footprint of the township of Broadwater which today appears as undeveloped farmland.

### 3.7.10. Section 10 – Richmond River to Coolgardie Road

In Section 10, the predicted site types related to farming and pastoral activities (Item 29 – ‘Stonehenge’ property, Wardell; Item 31 – House site, Wardell), non-British migrant influences and historical Aboriginal sites (Item 30 – Bamboo stands, Wardell) were identified. The predicted road transport infrastructure was found in the remnants of earlier routes of the Pacific Highway. The predicted site types related to exploration and early survey were not identified within this section of the project boundary.

### 3.7.11. Section 11 – Coolgardie Road to Ballina bypass

The model for this section of the project boundary predicted that the identification of historical heritage sites was highly unlikely. The survey and assessment for this section confirmed this predication. Previous routes of the Pacific Highway are situated in this area but are outside the project boundary.

## 3.8. Summary of historical and physical contexts

Table 3-7 provides a summary of all 38 historical heritage items identified during previous surveys and studies, heritage register searches and the 2010 and 2011 field survey programs. The sites are generally listed in sequence from Woolgoolga northwards to Ballina. A detailed description of each of these items is provided in Appendix A. Locations are provided in Figure 3-7 to Figure 3-17.

**Table 3-7: Summary of historical / archaeological heritage items or sites in and adjacent to project boundary.**

| Project section | Item no | Item name | Reference | Location | LGA |
|---|---|---|---|---|---|
| 1 | 1 | Stockyard and sheds, south of Corindi River, Corindi Beach | Kuskie and Carter (2007) | Lot 51 DP851056 | Coffs Harbour |
| 1 | 2 | House, sheds and stockyards, Milleara | Kuskie and Carter (2007) | Lot 9 DP707325 | Clarence Valley |
| 1 | 3 | Tree stumps, Milleara/ Halfway Creek | Kuskie and Carter (2007) | Lot 7 DP707325 and Lot 61 DP751368 | Clarence Valley |
| 1 | 4 | Schoolhouse, Halfway Creek | Kuskie and Carter (2007) | Lot 15 DP879175 | Clarence Valley |
| 2 | 5 | Stockyards north-west of Lemon Tree Road, Halfway Creek | Kuskie and Carter (2007) | Lot 1 DP558503 | Clarence Valley |
| 2 | 6 | Bridge and culvert, Halfway Creek | Kuskie and Carter (2007) | Within Pacific Highway road reserve, south of Halfway Creek | Clarence Valley |
| 2 | 7 | Service Station Complex, Halfway Creek | Kuskie and Carter (2007) | Lot 411 DP883976 | Clarence Valley |
| 2 | 8 | Survey mark, Halfway Creek | Kuskie and Carter (2007) | Lot 7300 DP1144709 | Clarence Valley |
| 2 | 9 | Bridge at Wells Crossing | Kuskie and Carter (2007) | Pacific Highway road reserve, Wells Crossing | Clarence Valley |
| 2 | 35 | Six Mile Tick Gate Remains, Glenugie | Heritage Concepts (2007) | Lot 20 DP1123940 | Clarence Valley |
| 2 | 36 | North Coast Railway Branch Tramway, Glenugie | Navin Officer (2009a) | Lot 74 DP751380, road reserve | Clarence Valley |
| 3 | 11 | Tyndale Residence, Tyndale | Clarence Valley Local Environmental Plan (2011), site ID I389 | Lot 2 DP586049 | Clarence Valley |

| Project section | Item no | Item name | Reference | Location | LGA |
|---|---|---|---|---|---|
| 4 | 10 | Tyndale Shed and Cane Barracks, Tyndale | Clarence Valley Local Environmental Plan (2011), site ID I387 | Lot 2 DP210874 and Lot 19 DP1007618 | Clarence Valley |
| 4 | 12 | Maclean Punt and former Ashby ferry, Maclean | Clarence Valley Local Environmental Plan (2011), site ID I194 | Lot 434 DP823599 | Clarence Valley |
| 4 | 22 | Former house site, Goodwood Street, Maclean (Property 315) | Field survey 2010 | Lot 376 DP751388 | Clarence Valley |
| 4 | 34 | Townsend Residence, Townsend | Clarence Valley Local Environmental Plan (2011), site ID I377 | Lot 1 DP501255 | Clarence Valley |
| 5 | 13 | 'Highfield' Residence, James Creek | Clarence Valley Local Environmental Plan (2011), site ID I158 | Lot 30 DP1136907 and Lot 31 DP1136907 | Clarence Valley |
| 5 | 14 | James Creek Residence, James Creek | Clarence Valley Local Environmental Plan (2011), site ID I161 | Lot 1811 DP1079120 | Clarence Valley |
| 5 | 15 | Harwood School Residence, Harwood | Clarence Valley Local Environmental Plan (2011), site ID I139 | Lot 1 DP818005 | Clarence Valley |
| 5 | 16 | Harwood School, Harwood | Clarence Valley Local Environmental Plan (2011), site ID I139 | Lot 1 DP818005 | Clarence Valley |
| 5 | 17 | Harwood Tram Tracks, Harwood | Clarence Valley Local Environmental Plan (2011), site ID I141<br>Field survey 2011 | Old Pacific Highway road reserve, Harwood<br>Petticoat Lane, Harwood | Clarence Valley |
| 5 | 18 | Harwood Water Brigade Hall, Harwood | Clarence Valley Local Environmental Plan (2011), site ID I143 | River Street, Harwood<br>Lots 168 and 169 DP751373, Reserve 44087 | Clarence Valley |
| 5 | 37 | River Street Trees, Harwood | Clarence Valley Local Environmental Plan (2011), site ID I145 | River Street, Harwood<br>Road reserve | Clarence Valley |

| Project section | Item no | Item name | Reference | Location | LGA |
|---|---|---|---|---|---|
| 5 | 19 | Harwood War Memorial, Harwood | Clarence Valley Local Environmental Plan (2011), site ID I144 | River Street, Harwood<br>Road reserve | Clarence Valley |
| 5 | 20 | Harwood Bridge, Harwood | Gardiner (2006) | Bridge over Clarence River, Harwood | Clarence Valley |
| 5 | 21 | Convent, Harwood | Navin Officer (2009b) | Lot 1 DP230181 | Clarence Valley |
| 5 | 32 | Harwood Heritage Conservation Area | Clarence Valley Local Environmental Plan (2011) | North of Clarence River at Harwood | Clarence Valley |
| 7 | 23 | New Italy Settlement Landscape (incl. Historic New Italy Village Area) | State Heritage Register 1648 | Lot 2 DP616005, Part Lot 72 and Part Lot 73 DP755609 | Richmond Valley |
| | | | Richmond Valley Local Environmental Plan (2012) sites IDs I145, I147, I148, I149, I150, A5, A7 | Lot 59 DP755609, Lot 25 DP755610, Lot 2 DP616005, Lot 1 DP207390, Lot 97 DP755609, Lots 30 and 37 DP755609 | |
| 7 | 24 | Vineyard Haven, New Italy Settlement | State Heritage Register 1715<br>Richmond Valley Local Environmental Plan (2012), site ID I146 | Part Lot 2 DP828347 | Richmond Valley |
| 8 | 25 | Woodburn Slaughterhouse, Trustrums Hill | Richmond Valley Local Environmental Plan (2012), site ID I166 | Lot 15 DP864108 | Richmond Valley |
| 9 | 26 | Maloney Property, Broadwater | Field survey 2010, 2011 | Lot 5 DP1142669 | Richmond Valley |
| 9 | 38 | Cemetery Reserve, Broadwater | Field survey 2010 | Lot 7008 DP92609 | Richmond Valley |
| 9 | 28 | Byrne Property, Broadwater | Heritage Concepts (2005) | Lot 6 DP1043232 | Richmond Valley |
| 10 | 27 | Meerschaum Vale Brickworks, Wardell | Heritage Concepts (2005) | Approximate location is Lot 7 DP866508 | Ballina |
| 10 | 29 | 'Stonehenge' Property, Wardell | Heritage Concepts (2005) | Lot 2 DP543525, Via Lumleys Lane, Wardell | Ballina |
| 10 | 30 | Bamboo stands, Properties 723 and 725, Wardell | Field survey 2010 | Lot 7 DP866508, Lot 172 DP755691 | Ballina |

| Project section | Item no | Item name | Reference | Location | LGA |
|---|---|---|---|---|---|
| 10 | 31 | Potential house site, Wardell | Field survey 2010 | Lot 158 DP755731 | Ballina |
| Multiple | 33 | High Conservation Value Old Growth Forests | State Heritage Register 1487 | Multiple locations along project boundary | Ballina, Richmond Valley, Clarence Valley, Coffs Harbour City |

Figure 3-7 Historical heritage items within the project boundary (section 1)

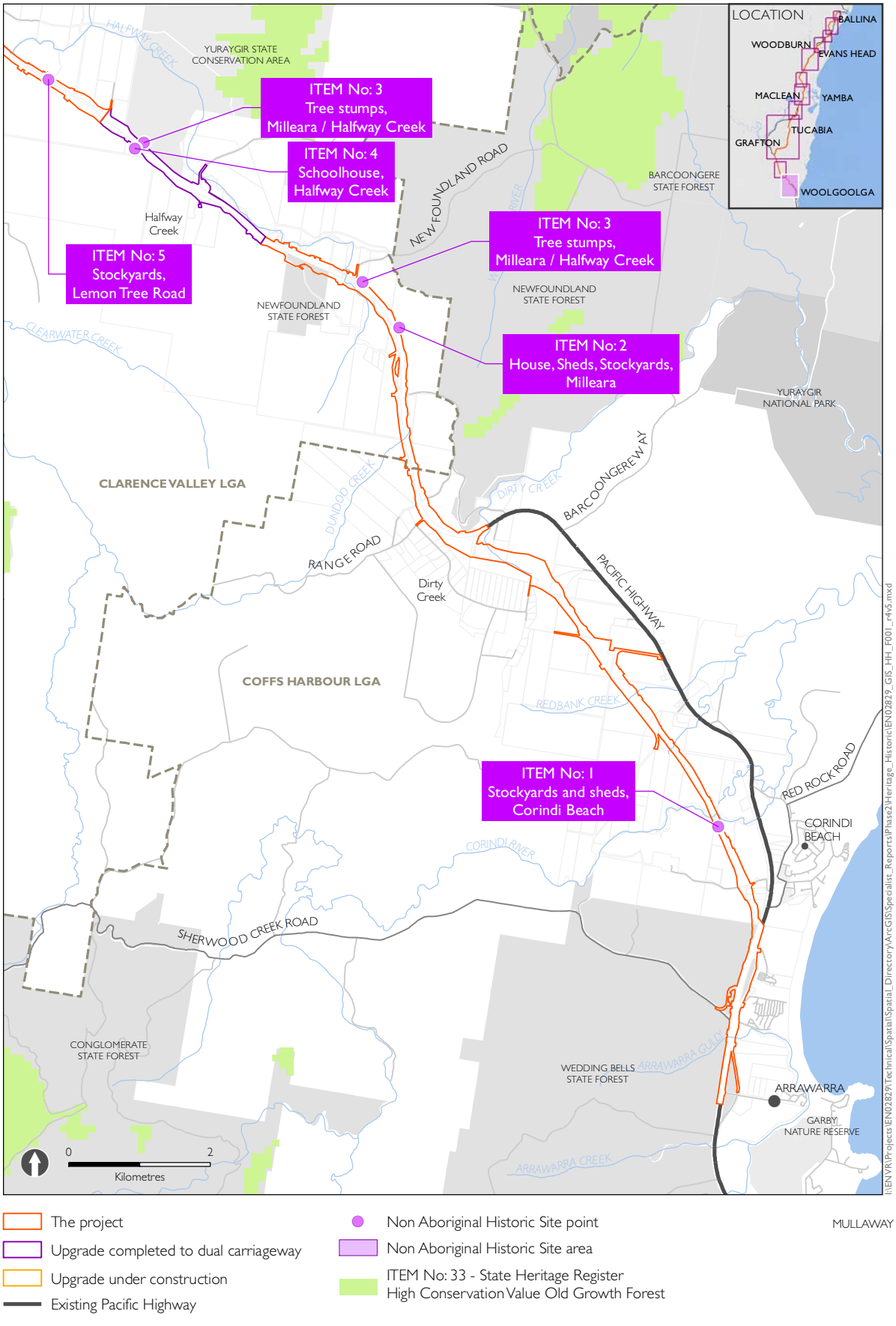


Figure 3-8 Historical heritage items within the project boundary (section 2)

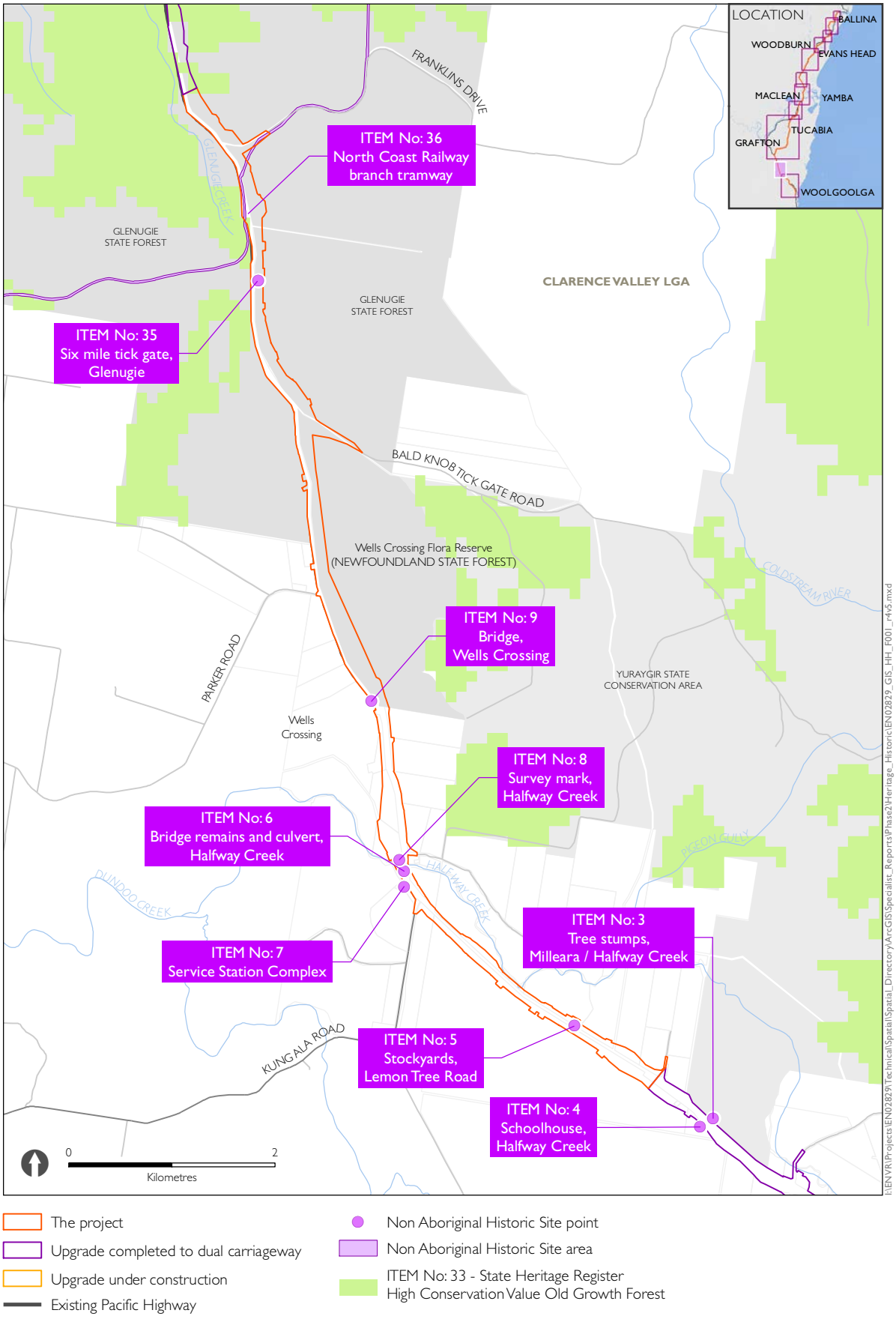


Figure 3-9 Historical heritage items within the project boundary (section 3)

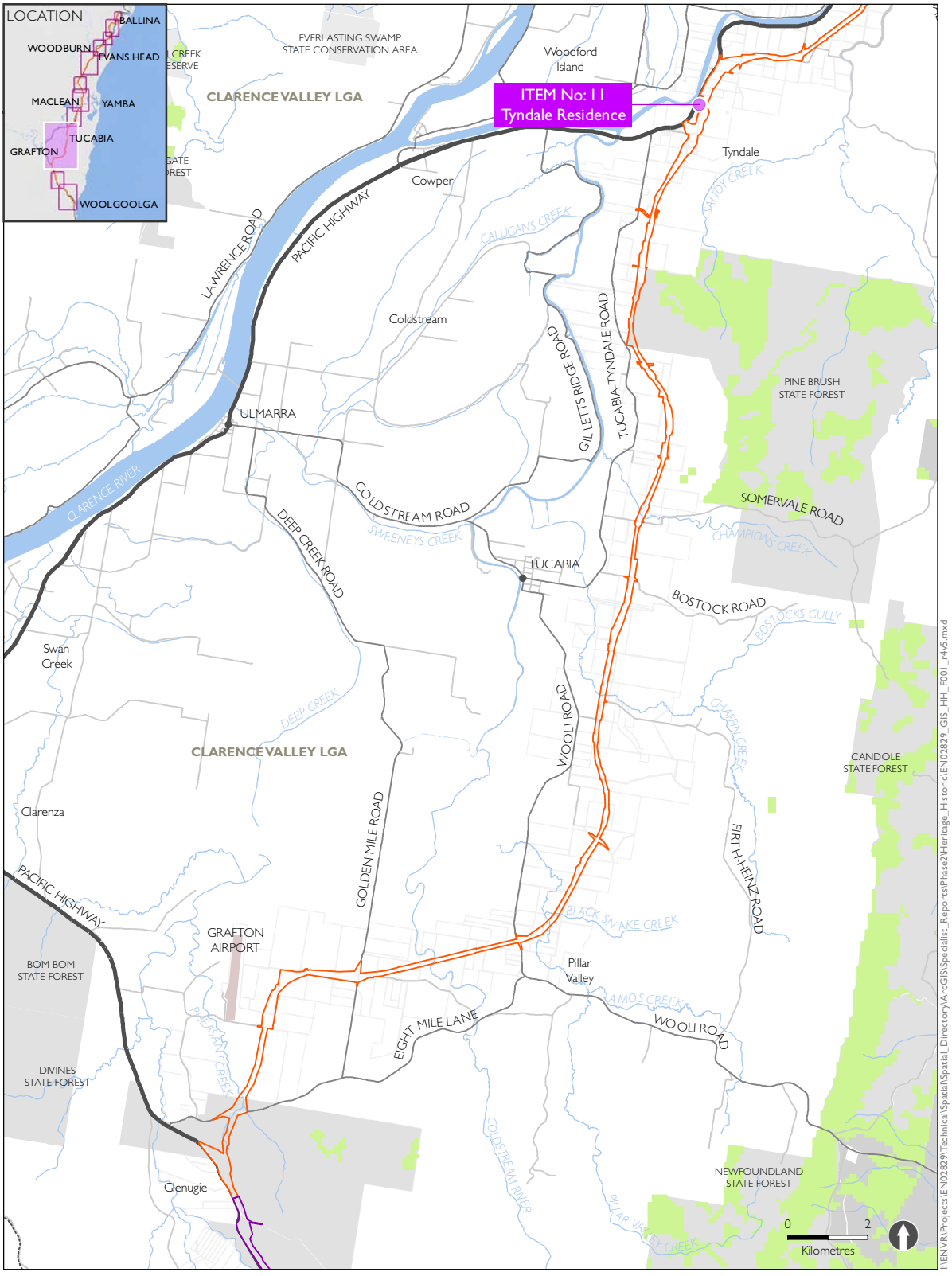


Figure 3-10 Historical heritage items within the project boundary (section 4)

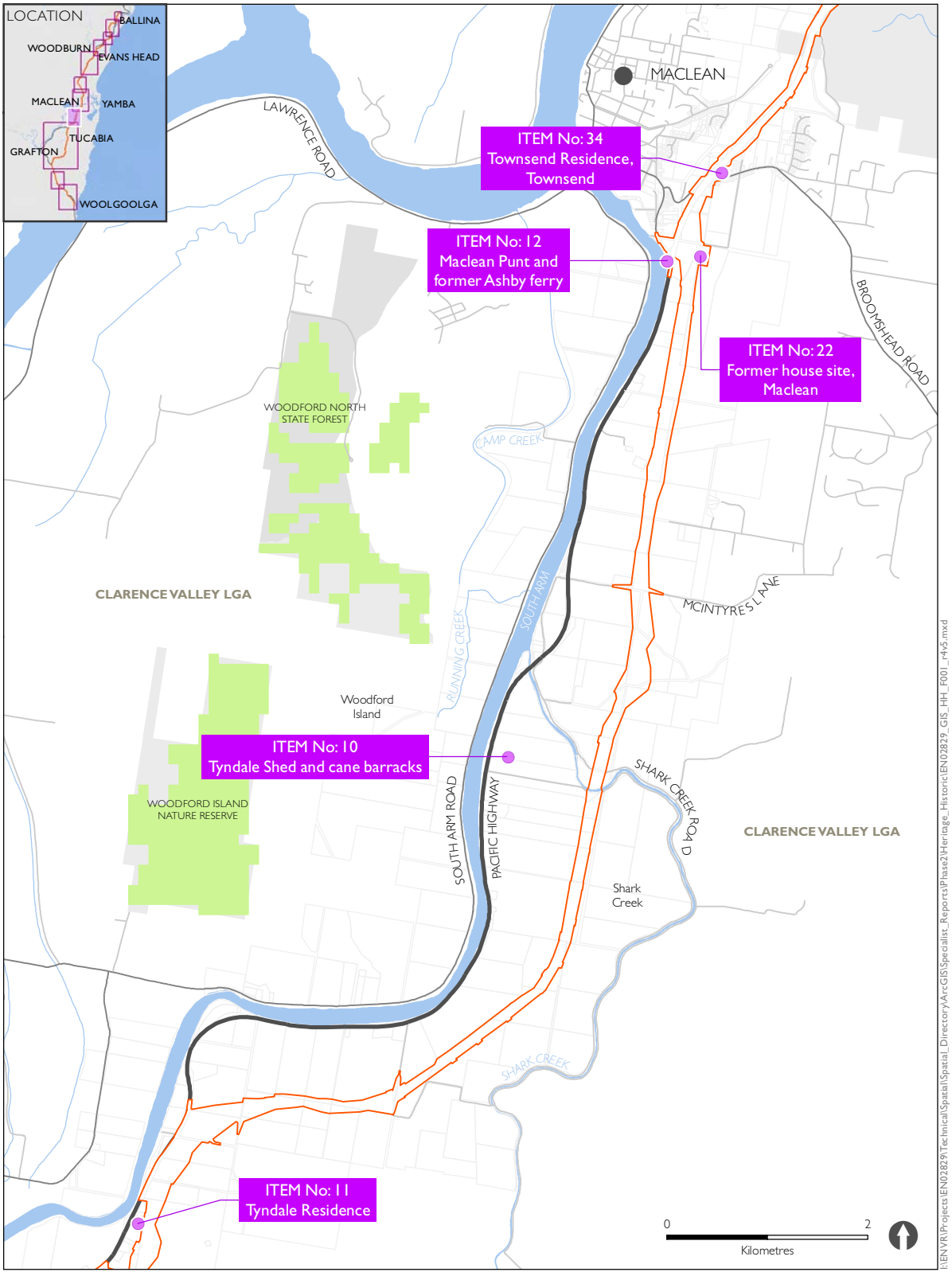


Figure 3-11 Historical heritage items within the project boundary (section 5)

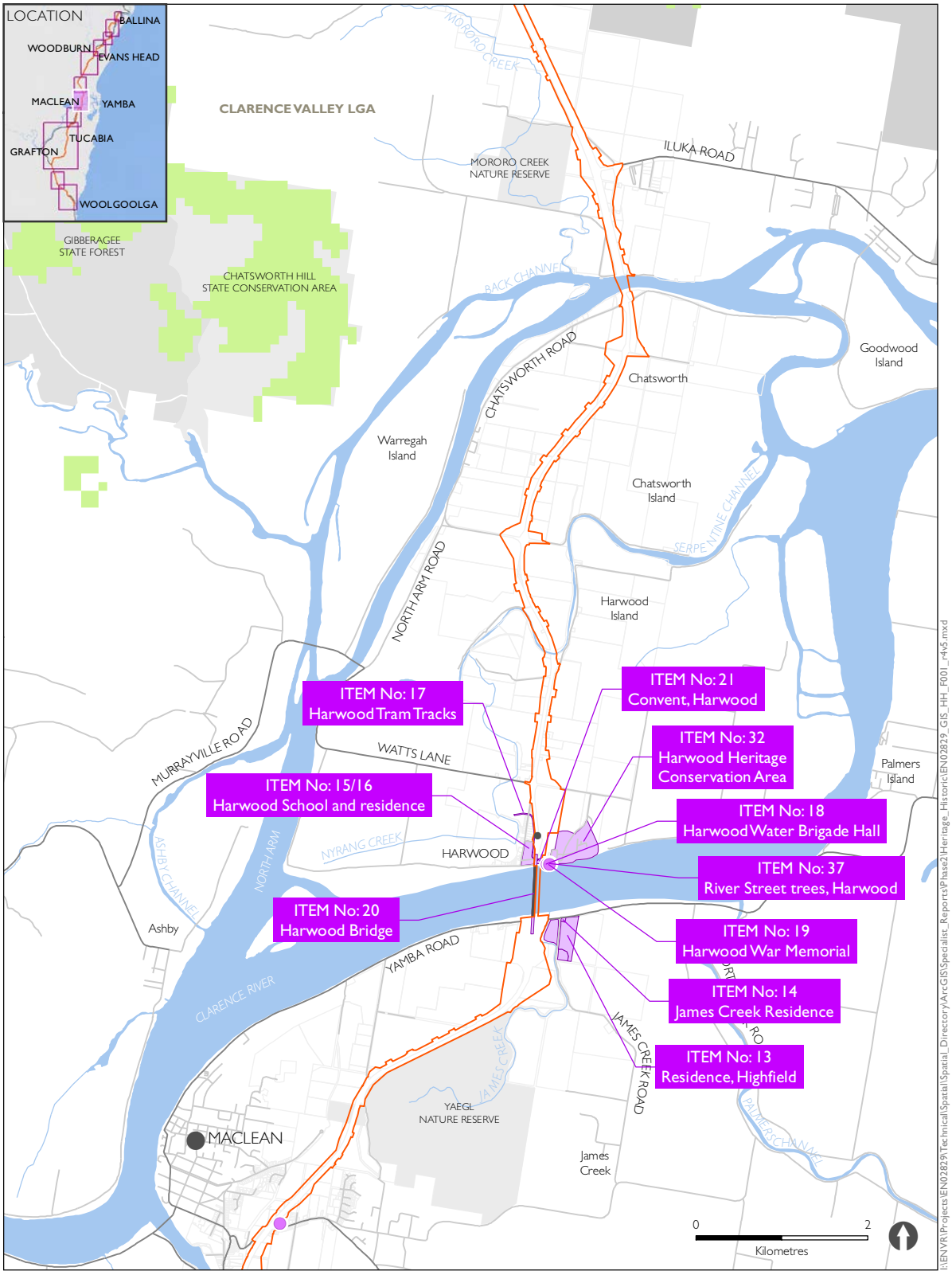


Figure 3-12 Historical heritage items within the project boundary (section 6)

Figure 3-13 Historical heritage items within the project boundary (section 7)

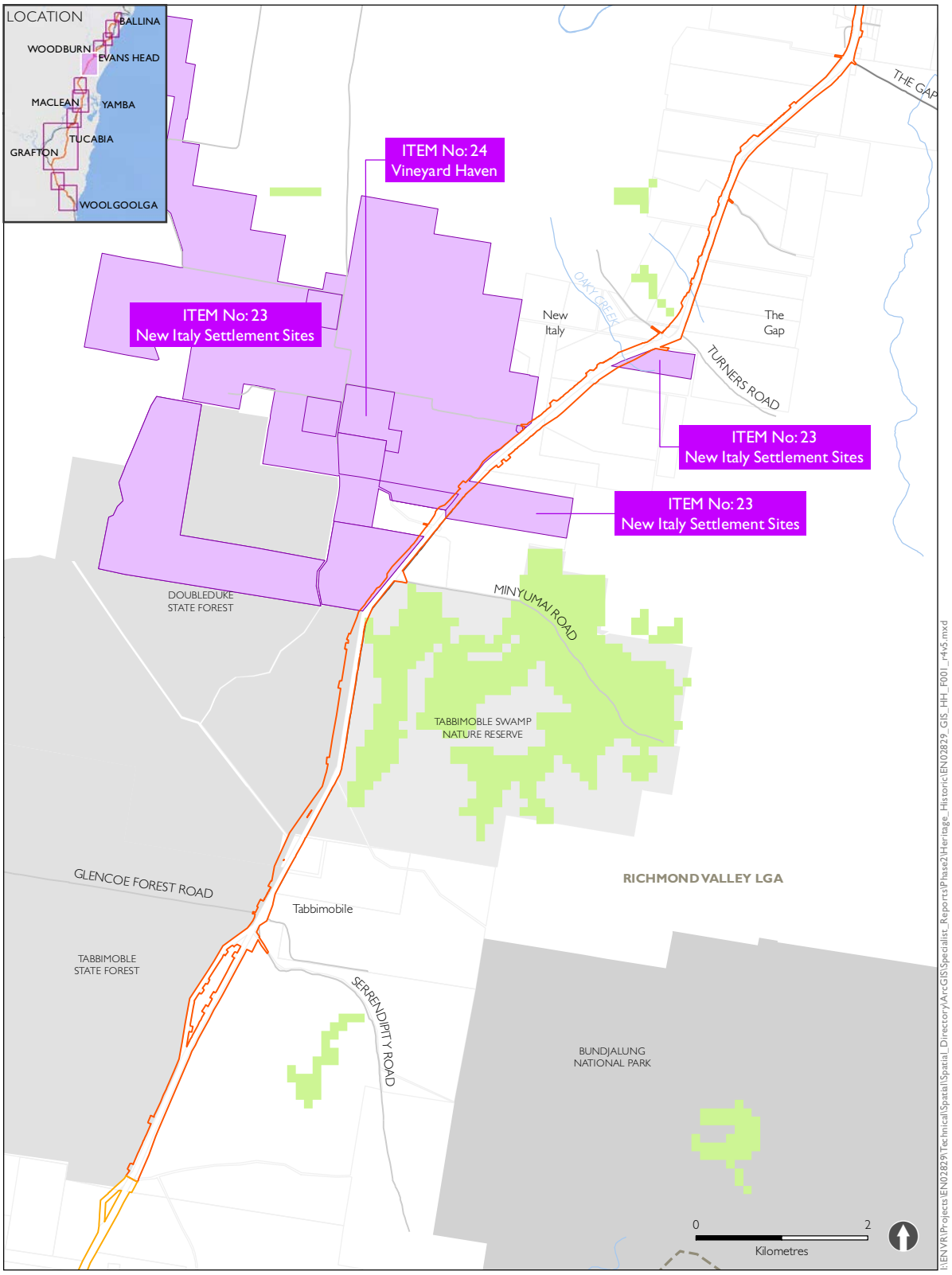


Figure 3-14 Historical heritage items within the project boundary (section 8)

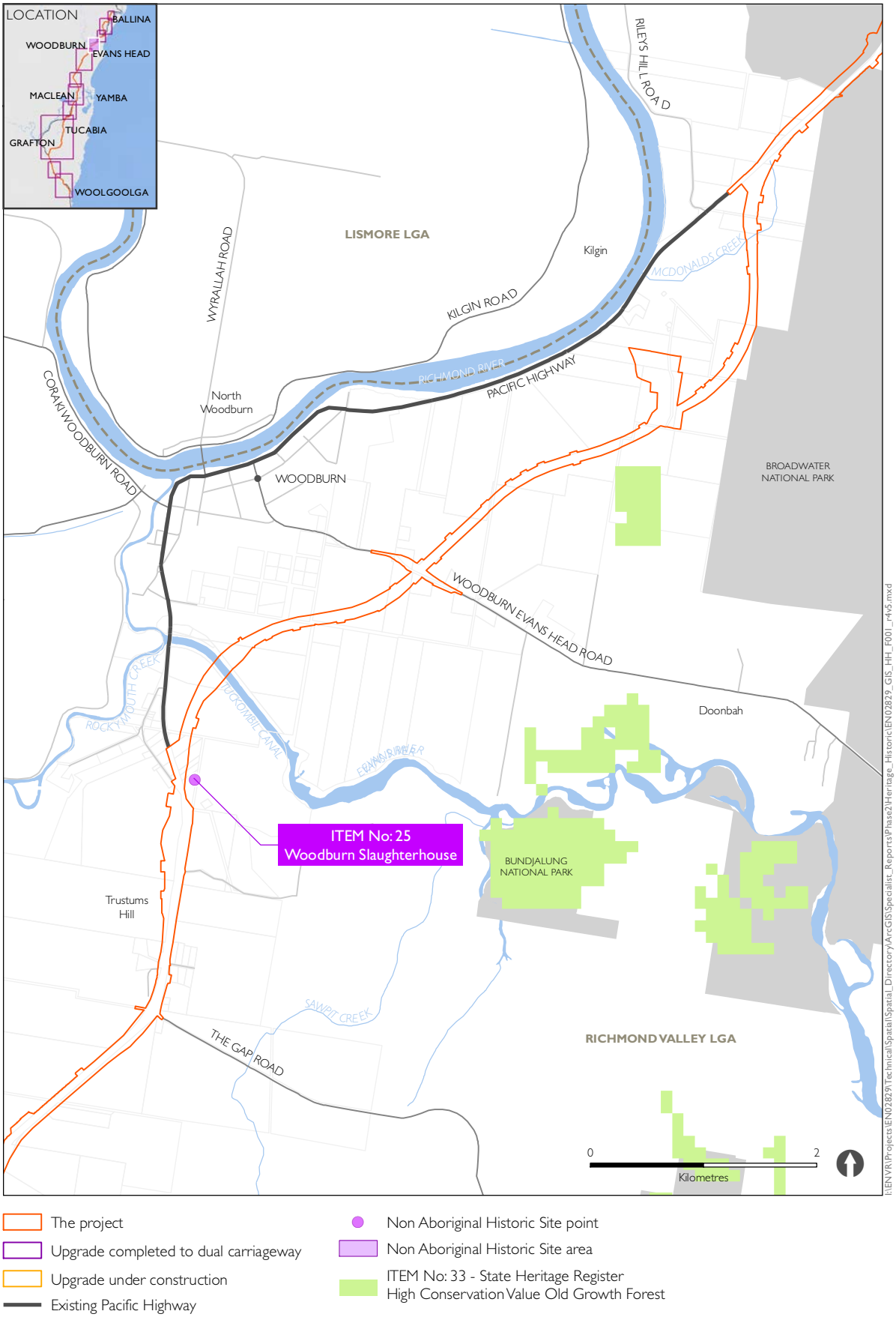


Figure 3-15 Historical heritage items within the project boundary (section 9)

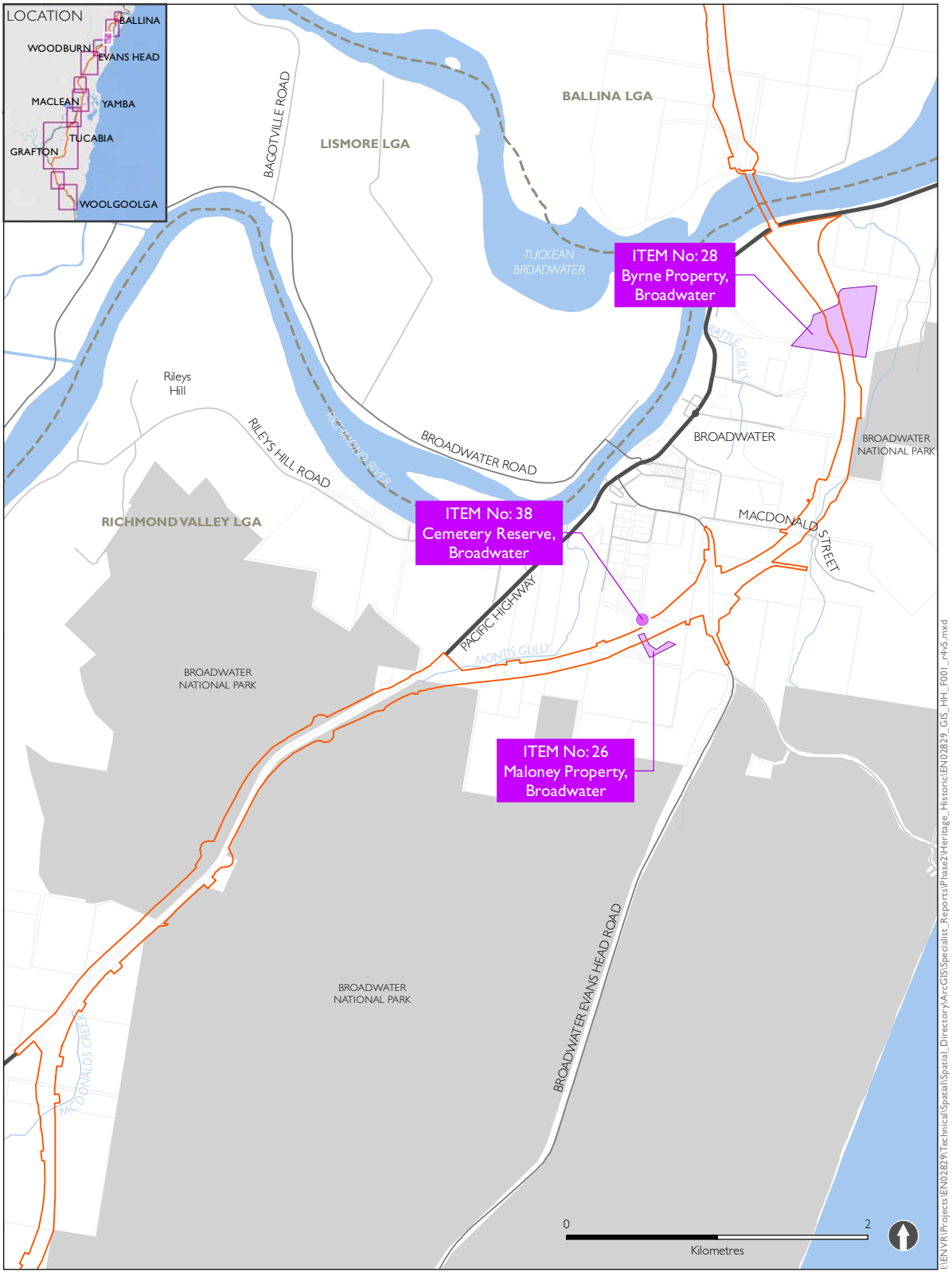


Figure 3-16 Historical heritage items within the project boundary (section 10)

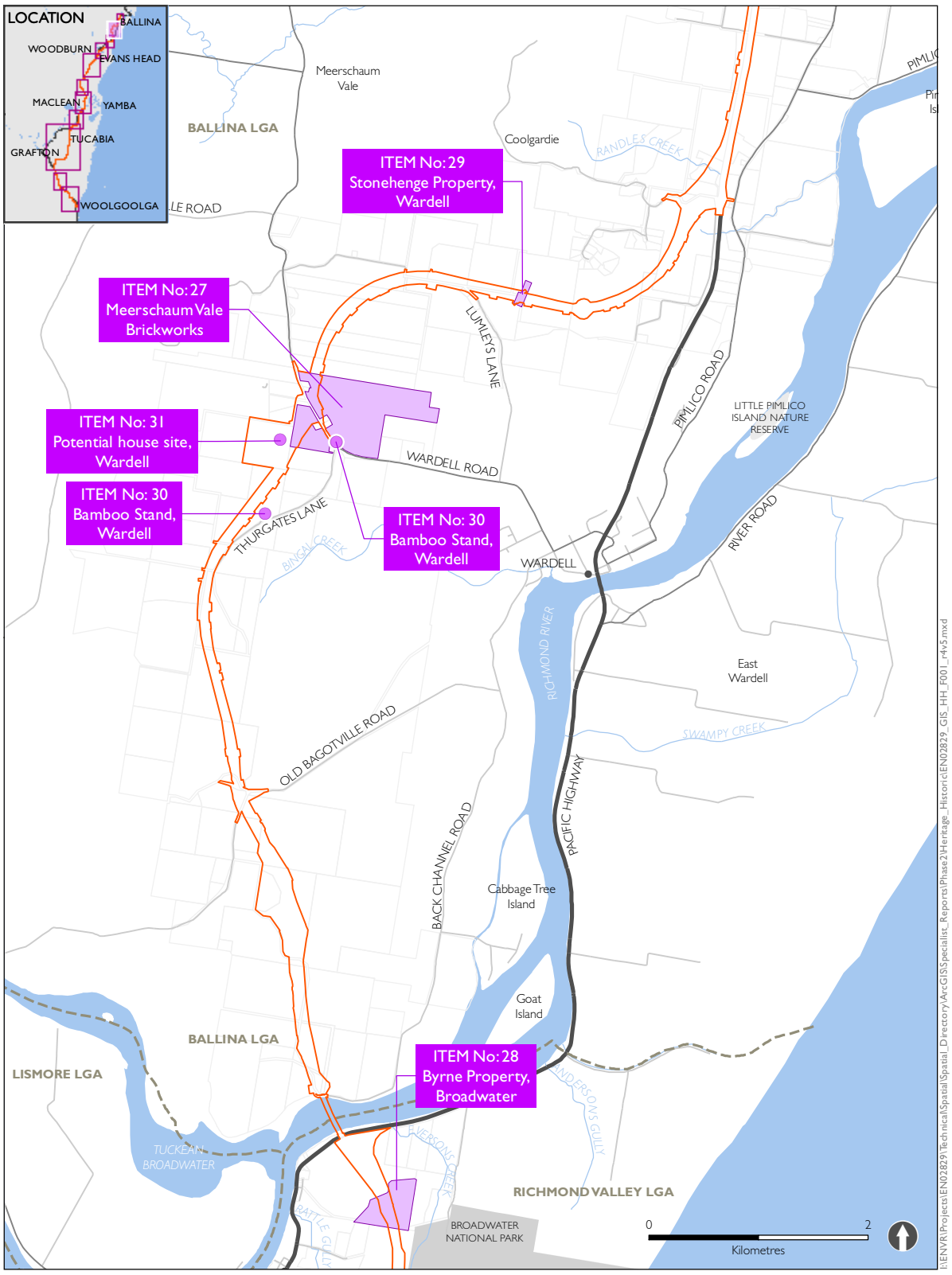
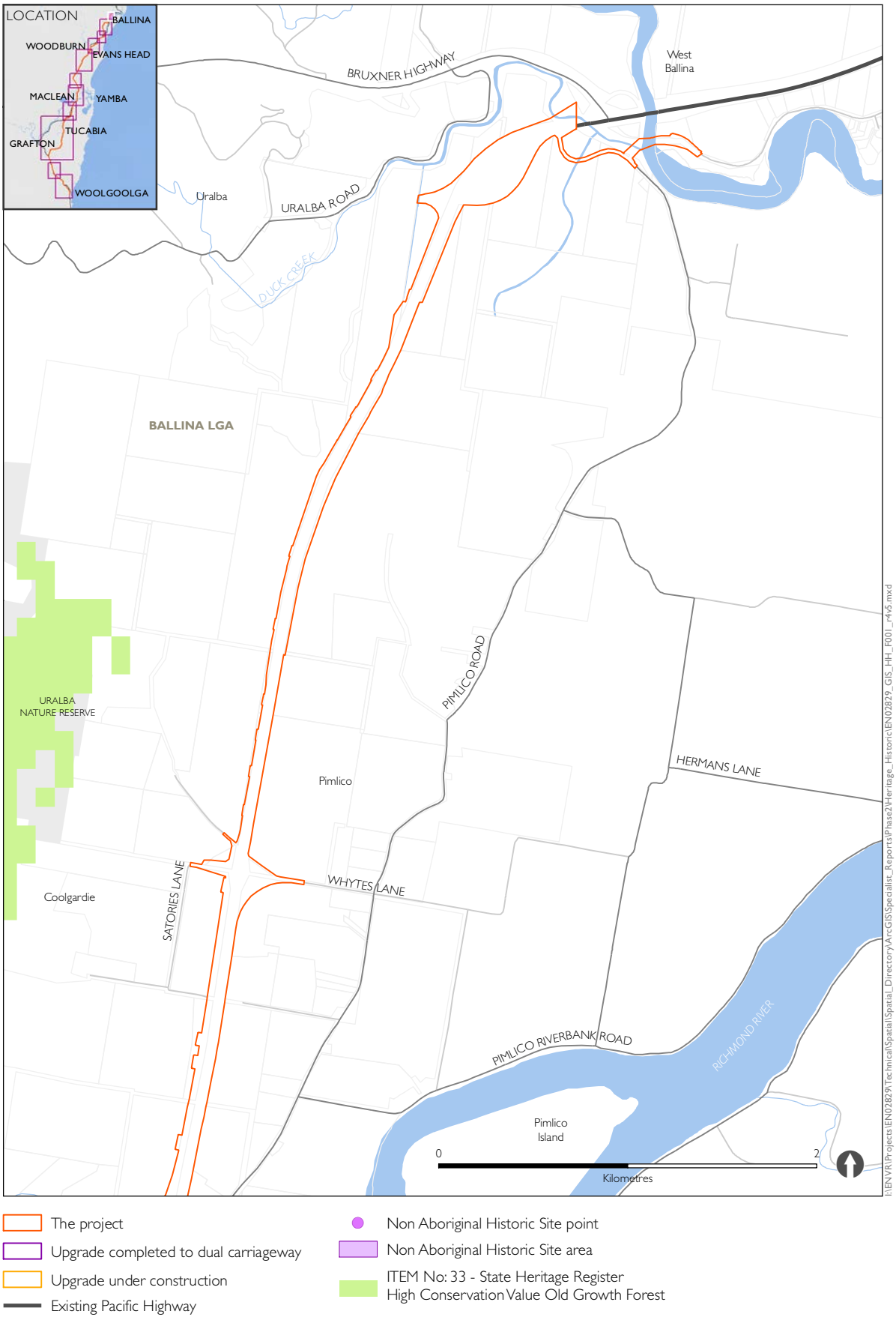


Figure 3-17 Historical heritage items within the project boundary (section 11)



# 4. Significance assessment

## 4.1. Specific heritage items

A statement of significance has been developed for each of the 38 items identified within or adjacent to the project boundary (detailed in Appendix A, mapped in Figure 3-7 to Figure 3-17 and summarised in Table 3-7). Each of the significance assessments were developed based on a combination of available information including previous assessments, personal communications and field investigations, following standard heritage practice. Details on available information used to determine significance for each heritage items are in Appendix A.

Of the 38 identified items, eight were not considered to have sufficient heritage significance to fulfil criteria for local or state heritage significance and are not considered further in the impact assessment (Items 1, 4, 5, 6, 8, 9, 22 and 31). Twenty-seven items are considered to have local heritage significance, and three items were considered to have state heritage significance. A summary of the significance of each item is presented in Table 4-1. The potential impacts of the project on the heritage significance of the 30 items identified as being of local or state level heritage significance are considered in chapter 5.

**Table 4-1: Summary heritage significance of heritage items.**

| Project section | Item no | Item name | Statement of significance |
|---|---|---|---|
| 1 | 1 | Stockyard and sheds, south of Corindi River, Corindi Beach | Item **does not meet the criteria thresholds** for local or state listing. |
| 1 | 2 | House, sheds and stockyards, Milleara | The site is of historical and scientific significance and has the potential to yield information relating to the early settlement of the Milleara region and may provide evidence of the social, industrial and domestic activities of that early settlement, including a family involved in the timber industry. The site is of **local heritage significance.** |
| 1 | 3 | Tree stumps, Milleara/Halfway Creek | The tree stumps with logging marks are considered to have local historical significance with the potential to yield information about timber harvesting methods in the North Coast. The integrity of these stumps is fair. The stumps are slowly decaying through natural processes. The archaeological potential of these items is negligible. The site is of **local heritage significance**. |
| 1 | 4 | Schoolhouse, Halfway Creek | Item **does not meet the criteria thresholds** for local or state listing. The archaeological potential is low. |
| 2 | 5 | Stockyards north-west of Lemon Tree Road, Halfway Creek | Item **does not meet the criteria thresholds** for local or state listing as modifications to the structures over time have reduced its potential to provide information. The integrity of the site is fair, but the archaeological potential is low. |
| 2 | 6 | Bridge and culvert, Halfway | Item **does not meet the criteria thresholds** for local or state listing as decay and degradation of the structure over time have reduced its |

| Project section | Item no | Item name | Statement of significance |
|---|---|---|---|
| | | Creek | potential to provide information. The remains are in poor condition and the archaeological potential is assessed as negligible. |
| 2 | 7 | Service Station Complex, Halfway Creek | The site has historical and scientific significance and provides scope for further research into the history of the region. The integrity of the remains ranges from fair to good. The archaeological potential is assessed as high, and according to oral sources the remains of the original coach waystation are located beneath the standing restaurant. The footprint of the stables may also exist in the adjoining paddock. Refuse dumps are also likely to occur in the vicinity. This site may provide significant evidence of the early transportation links in this area. The site is of **local heritage significance.** |
| 2 | 8 | Survey mark, Halfway Creek | Item **does not meet the criteria thresholds** for local or state listing. It demonstrates a method commonly employed by surveyors in rural areas. The integrity of the item is fair but the timber is decaying. The archaeological potential of the item is negligible. |
| 2 | 9 | Bridge at Wells Crossing | Item **does not meet the criteria thresholds** for local or state listing. Bridges of this method of construction are relatively commonplace. The archaeological potential of the item is negligible. |
| 2 | 35 | Six Mile Tick Gate, Glenugie | The cattle tick was first reported in the Northern Territory in 1872 and it had spread through the tropical and sub-tropical climates of Western Australia, Northern Territory and Queensland and arrived in NSW in 1906. The NSW Department of Agriculture (now the Department of Primary Industry) have employed various strategies to control the spread of the cattle tick into NSW. The Six Mile Tick Gate is one of the control strategies the Department employed during the 20th century to prevent the spread of the cattle tick into and out of the Grafton quarantine area. The site is important for its role as part of the control strategies for controlling the spread of cattle tick in NSW. The site is of **local heritage significance**. |
| 2 | 36 | North Coast Railway Branch Tramway, Glenugie | The North Coast Railway Branch Tramway is important in demonstrating the necessary methods, such as the need to build a branch line to obtain suitable construction material, employed for the construction of the North Coast Rail line in the local area, and the importance of the local basalt resource of Glenugie Peak to the development of the early 20th century rail network in that area. The tramway has a strong association with works of the Chief Engineer for Railway and Tramway Construction, and the NSW Department of Public Works and their role in the construction of the North Coast Rail line in the local area. The tramway possesses uncommon aspects of the cultural history of the local area due to the need to obtain 'suitable stone' from the nearby outcrop of basalt. The tramway alignment is important in demonstrating the principal characteristics of subsidiary branch lines/ tramways during mainline rail development throughout NSW. The site is of **local heritage significance**. |
| 3 | 11 | Tyndale Residence, Tyndale | The house, and associated mature bunya trees, is architecturally significant as a good example of a large Victorian residence. The site is of **local heritage significance**. |

| Project section | Item no | Item name | Statement of significance |
|---|---|---|---|
| 4 | 10 | Tyndale Shed and Cane Barracks, Tyndale | This unmodified cane cutters barracks is of historical significance as it represents a significant change in the type of accommodation provided for workers, cane cutters, in the sugar industry. Previously cane cutters had slept in tents and cooking was undertaken in galvanised iron galleys. It is a particularly good example of its type. The site is of **local heritage significance.** |
| 4 | 12 | Maclean Punt and former Ashby ferry, Maclean | The former Ashby ferry, cane barge and sugarcane hoist in Ferry Park are historically significant as they demonstrate the importance of river transport in the Maclean district. Both vessels worked the river in the vicinity of Maclean and the sugarcane hoist helped to load local sugarcane onto cane barges. As such all three heritage items are of local significance. Ferries are now rarely seen on the Clarence River, cane barges are never visible and sugarcane hoists such as the one on display are no longer used. This display, at the entrance to Maclean, therefore has significance for its educational value. The site is of **local heritage significance.** |
| 4 | 22 | Former house site, Goodwood Street, Maclean (Property 315) | Item **does not meet the criteria thresholds** for local or state listing. The site and surrounds are highly disturbed and the remnants are fragmentary. |
| 4 | 34 | Townsend Residence, Townsend | The significance of this cottage lies in its early original c1870s form having double pitched roof extending smoothly over encircling verandahs. However it has been substantially modified. The site is of **local heritage significance**. |
| 5 | 13 | 'Highfield' Residence, James Creek | 'Highfield' is significant for its association with the Cameron family, its links to river transport and Page's brickworks. It is also significant for its association with early land subdivision. Architecturally the building is significant as a rare example of a substantial brick residence in the region. The site is of **local heritage significance.** |
| 5 | 14 | James Creek Residence, James Creek | The house is significant as a well maintained example of a 1930s bungalow built in a prominent location on the main Yamba Road. The house is significant for its association with the second generation of the pioneering Cameron family. The site is of **local heritage significance.** |
| 5 | 15 | Harwood School Residence, Harwood | The Harwood Island Public School residence (together with the schoolhouse) is a particularly substantial and relatively rare remaining example within the region of the late Victorian period design. The residence (in association with the school) provides evidence of the development of Harwood Island in the latter half of the 19th century and particularly the importance of the sugar industry in the southern part of the island. One of the oldest buildings on the site the Victorian Georgian residence is a typical representative example of its period and style. The significance of the residence is enhanced by its grouping together with the schoolhouse and by the degree to which it has retained important early fabric and features. The site is of **local heritage significance.** |
| 5 | 16 | Harwood School, Harwood | The Harwood Island Public School (together with the school residence) is a particularly substantial and relatively rare remaining example within the region of the late Victorian period design. The school provides evidence of the development of Harwood Island in the latter half of the 19th century and particularly the importance of the |

| Project section | Item no | Item name | Statement of significance |
|---|---|---|---|
| | | | sugar industry in the southern part of the island. The site has continued as a public school to the present day. Architecturally the oldest buildings on the site - the Victorian Gothic schoolhouse and Victorian Georgian residence - are typical representative examples of their periods and styles. Their significance is enhanced by their grouping together and by the degree to which they have retained important early fabric and features. Later alterations and additions, however, particularly to the schoolhouse/classroom have detracted from the building's aesthetic significance as good representative examples of their particular period and architectural style. The library building located nearby is a significant prefabricated building of circa 1930. The site is of **local heritage significance.** |
| 5 | 17 | Harwood Tram Tracks, Harwood | These sections of tramline are historically significant as they illustrate the changing nature of the sugar cane industry, an industry which was initially labour intensive but which now sees most tasks undertaken by mechanical harvester. These small sections of tramline are representative of the tramlines once used throughout the region. It is rare to find them in situ and only three examples are known to exist on Harwood Island. The site is of **local heritage significance.** |
| 5 | 18 | Harwood Water Brigade Hall, Harwood | The Water Brigade Hall has historical significance as a rare example of the need to provide emergency services to those affected by flooding. The hall tells of the early importance of water transport to the Clarence valley communities. The fact that the building contained a reading room illustrates the need for multipurpose buildings in small communities. Halls constructed with the sole purpose to house the water brigade are rare and this appears to be the only one still standing on the Clarence River, giving it regional significance. The hall is socially significant to the Harwood community who now use it for boat storage and as meeting place. It is also associated with the famous rower Henry Searle and his family, who lived on nearby on Esk Island. The site is of **local heritage significance.** |
| 5 | 37 | River Street Trees, Harwood | The trees are historically significant showing the endeavours of early residents to improve their town (SHI Listing). The trees demonstrate aesthetic characteristics in providing an attractive backdrop to the War Memorial. The site is of **local heritage significance**. |
| 5 | 19 | Harwood War Memorial, Harwood | The Harwood War Memorial is an elegant memorial located on the riverbank. It is significant to Harwood families who had relatives serving in World War I and links Harwood to world events. Its form, in the style of an obelisk, is representative of other War memorials on the Clarence River. The site is of **local heritage significance.** |
| 5 | 20 | Harwood Bridge, Harwood | The Harwood Bridge is of historical significance as it represents the solution to a major transport issue in the mid-20$^{th}$ century. The bridge is of architectural significance as it is a functional and well maintained example of the last 20$^{th}$ century steel truss bridge built in northern NSW. The bridge is aesthetically distinctive and representative of the town of Harwood, demonstrated in its use in the logo for the Harwood Public School. The bridge demonstrates the principal characteristics of steel truss bridges, a technology that is no longer used in NSW. The site is of **local heritage significance.** |

| Project section | Item no | Item name | Statement of significance |
|---|---|---|---|
| 5 | 21 | Convent, Harwood | The Convent is of historical significance as it demonstrates the growth, development and decline of the town of Harwood and its associated requirements for education and religion. It is also located within the Harwood Conservation Area (Clarence Valley Local Environmental Plan 2011), which incorporates sites associated with the Harwood Sugar Mill, including structures in the village itself whose growth and demise are linked to the history of the Mill. The site is of **local heritage significance.** |
| 5 | 32 | Harwood Heritage Conservation Area | The Harwood Heritage Conservation Area demonstrates the development and decline of the town through its association with the Harwood Sugar Mill, the oldest continuously operating sugar mill in NSW. It also demonstrates the importance of the sugar industry to the local region from the 19th century onwards. The Area has the potential to yield information regarding the change and development of sugar industry processes and technology through research into items such as the *Beardmore* Tug, a cane grab, an early cane planter and other pieces of equipment. The site is of **local heritage significance**. |
| 7 | 23 | New Italy Settlement Landscape (incl. Historic New Italy Village Area) | The New Italy Settlement Landscape is of state significance as evidence of a settlement built through the tenacity, forbearance and technical skills (especially horticultural and architectural) of a unique group of Australian settlers. It is also significant to those displaced Italian migrants who were allowed assisted passage to Australia by Sir Henry Parkes after the ill-fated Marquis de Rays expedition of 1881. Linked to this surviving archaeological heritage both by location and trust management by descendants of these early settlers is the current New Italy Museum Complex. This museum complex stands as a vibrant and living monument to the important contributions made by these (and other) Italian migrants to the past and present cultural and social identity of the North Coast region and the whole state of NSW.<br>Moreover the Museum complex is a continuing celebration of multicultural Australia and the important links forged between the Italian and wider Australian community. The ongoing patronage of the site by Italian and non-Italian local and state dignitaries is evidence of the esteem in which the heritage of New Italy is held by the broader community. The commitment and co-operation of various groups in maintaining and developing the museum complex and school sites as well as the broader New Italy landscape by numerous community groups and individuals provides a continuity of partnership between the Italian and non-Italian community which began when the Italian settlers first arrived.<br><br>The site is of **state heritage significance**. |
| 7 | 24 | Vineyard Haven, New Italy Settlement | 'Vineyard Haven' occupies the property originally taken up by the French Palis Brothers, and then the Italian Giovanni Guarischi, and contributes to the state significant New Italy Settlement Landscape. The whole landscape is of state significance as evidence of a settlement built through the tenacity, forbearance and technical skills of a unique group of settlers. It contains remnants of the landscape encountered by the settlers and evidence of their domestic and work practices. These relics and archaeological items include a dam site, a timber lined well, a mound, vines, vine contours on the landscape, |

| Project section | Item no | Item name | Statement of significance |
|---|---|---|---|
| | | | former water trenches and other archaeological evidence.<br>The site's context is also important. The original track from Chatsworth Island to Swan Bay traversed Vineyard Haven according to a line drawn and written comment on the Original Survey Plan of Portion 36 which was surveyed on 14 March 1883. This track is very closely aligned to the walking path that the first settlers took from Swan Bay (the landing place upstream a few kilometres from Woodburn on the Richmond River) to take up this land.<br>The gateway to the property of Vineyard Haven is opposite the site of the Italian Settlers Saint Peter's Church which was erected in 1907 after an earlier church was destroyed by a fire. This church was demolished in 1945 after being damaged by a Storm. Another important aspect of the context is the bushland setting ,much of which has regrown on Vineyard Haven and which is reminiscent of the setting and circumstances that would have faced the first Italian and French settlers when they arrived in 1882.<br><br>The site is of **state heritage significance**. |
| 8 | 25 | Woodburn Slaughterhouse, Trustrums Hill | The Woodburn slaughterhouse has historical significance as it demonstrates the importance of local food production and distribution in the Woodburn-Evans Head region. It is representative of its type, having both slaughtering and condensing facilities. As meat processing regulations became more stringent in the 1960s and cattle were sent to large abattoirs, slaughterhouses were closed throughout the Richmond Valley and most have been demolished. This is the only known slaughterhouse extant in the Richmond Valley. This site is of **local heritage significance**. |
| 9 | 26 | Maloney Property, Broadwater | The Maloney Property is considered to be of importance in the pattern of NSW's history as it demonstrates the pattern of early settlement in the Broadwater region and has the potential to yield information about the nature and evolution of dairy farming in the 19th and 20th centuries. The site has special associations with the local brick maker Patrick Sheehy and is also significant for its ongoing connection with the Maloney family, an early settler family in the region who continue to own, run and occupy the property. The site is considered rare as the dairy farming industry was once important in the region but is now uncommon. The buttery/creamery is also representative of its type. The site is of **local heritage significance**. |
| 9 | 38 | Cemetery Reserve, Broadwater | While little is known of the history of the cemetery, the declaration of the cemetery reserve is linked to the history of Broadwater and its growth and development as a township associated with the sugar industry. It may also demonstrate the pattern of declaration of reserves by centralised government without consideration for local requirements and conditions. There is no physical evidence of grave markers in the reserve and it is unclear from the historical documentation whether it was actually used as a cemetery. However it is known to long-term local residents as the location of a cemetery. The site is of **local heritage significance**. |
| 9 | 28 | Byrne Property, Broadwater | The Byrne property demonstrates the pattern of settlement in the North Coast region of NSW from the 19th century to the present day with the early development and ongoing importance of the sugar industry to the region. The site is of historical significance as it is |

| Project section | Item no | Item name | Statement of significance |
|---|---|---|---|
| | | | associated with early European settlement in the district. The site is of significance for its strong and ongoing association with the Byrne family, one of the earliest families in the district, who continue to run the property as a sugar cane farm. The site is significant for its potential to yield information about the region's past. The surface artefacts and other features indicate a rich archaeological resource with high research potential for answering questions associated with historical research themes identified for the study area including 'Developing local, regional and national economies' and 'Building settlements, towns and cities'. Specifically the site has potential to provide information on the little-documented, everyday lives of workers associated with the sugar industry, a key industry for the entire region. There is also the potential to yield information about the variety of activities undertaken in supporting the operation of an early sugar cane farm including the attitude towards self-sufficiency particularly highlighted by the presence of brick-making and stone quarrying on the site. The site is of **local heritage significance.** |
| 10 | 27 | Meerschaum Vale Brickworks, Wardell | The site has historical significance. Prior to extensive road transport, bricks were produced to meet local demand at several local brickworks, this site may demonstrate a local solution to a resource need. The site is of **local heritage significance**. |
| 10 | 29 | 'Stonehenge' Property, Wardell | The site represents an intact example of different farming techniques including share farming, dairy farming and cane farming. The buildings on site and the moveable heritage items have the potential to yield information of an historical nature. The site is of **local heritage significance**. |
| 10 | 30 | Bamboo stands, Properties 723 and 725, Wardell | These sites may be linked to Chinese migrants in the region in the 19th century demonstrating the variety of cultural influences in NSW's history. The site has moderate archaeological potential for evidence of gambling activities. The site is of **local heritage significance.** |
| 10 | 31 | Potential house site, Wardell | Although the property has some associations with local families, the property **does not meet the criteria thresholds** for local or state listing. The site remnants are fragmentary and do not contain potential for archaeological deposit. |
| Multiple | 33 | High Conservation Value Old Growth Forests | Old growth forest is ecologically mature eucalypt forest showing few signs of human disturbance. The upper canopy trees are no longer growing in height or spreading their crowns and show signs of old age. As the historical context for this project demonstrates, initial European settlement of the region focused on timber getting and land clearing for agriculture, pastoralism and townships. The remains of examples of old growth forests are therefore rare. HCVOG Forest represents the best examples remaining of such forests.<br><br>The site is of **state heritage significance**. |

## 4.2. Historical Pacific Highway infrastructure

Throughout the project boundary, there are many areas where physical remains of earlier routes and infrastructure of the Pacific Highway are present, including pavement surfaces, culverts, bridges and associated evidence of construction (Table 4-2). Little consideration has been made previously regarding the heritage significance of the Pacific Highway in NSW. At best, individual components of the Highway, most often bridges are listed on state or local registers. For the section of the Pacific Highway subject to this project, only one component of the Highway is listed on a register - Shark Creek Bridge, near Grafton is listed in the Clarence Valley Local Environmental Plan 2011 and the NSW Roads and Maritime Services Section 170 Heritage and Conservation Register for its local heritage significance.

Where specific items of Pacific Highway infrastructure have been identified during this assessment these have been assessed individually (Item 6 - Bridge and culvert, Halfway Creek; Item 7 - Service Station Complex, Halfway Creek; Item 9 - Bridge, Wells Crossing; Item 20 - Harwood Bridge). The remainder of the physical historical infrastructure of the Pacific Highway is described and examined broadly, taking more of a cultural landscape approach to its significance and the impacts upon it.

A broad-level significance assessment of the Pacific Highway as a whole from its commencement north of Sydney through to the Queensland border is provided below.

| Criterion | State level |
|---|---|
| A – Important in the pattern of NSW's history | The Pacific Highway is important in demonstrating the expansion and development of NSW from its growth out of early coach roads and its association with the increasing popularity of the motor vehicle. Both the physical material of the Pacific Highway and the route it takes through the landscape are important in demonstrating NSW's pattern of development. |
| B – Strong or special associations | The Pacific Highway has strong associations with the various government agencies responsible for road construction and maintenance and with specific individuals important in the development of NSW's road network. |
| C – Demonstrating aesthetic characteristics and/or a high degree of creative or technical achievement | Certain components of the Pacific Highway, particularly bridges, demonstrate aesthetic characteristics and a high degree of technical achievement. |
| D – Strong or special associations with a particular community or cultural group | Does not meet this criterion. |
| E – Potential to yield information | Certain components of the Pacific Highway may provide information on late 19th to early 20th century road construction and bridge building |

| Criterion | State level |
|---|---|
| | technology. |
| F – Uncommon or rare | Further assessment of the various components of the Pacific Highway would be required to demonstrate their relative rarity. |
| G – Principal characteristics of a class | The Pacific Highway demonstrates principal characteristics of roads constructed for motor vehicles with various components demonstrating the key aspects of road construction technology at particular time periods. |

**Table 4-2: Sections of original 1928 Pacific Highway alignment now bypassed**

| Project section | Bypassed section | Approximate date built* | Date bypassed | Approximate length (km) | Comments |
|---|---|---|---|---|---|
| 1 | Eggins Drive, Arrawarra, east of existing highway | 1928 | 1985 | 2 | Road still in use |
| 1 | Coral Street, Corindi Beach | 1928 | 1980 | - | Road still in use |
| 1 | Blackadder Road, Corindi | 1928 | 1953 | - | Road still in use |
| 1 | Dirty Creek Road, Dirty Creek<br>Falconers Lane, Dirty Creek | 1934 | 1987 | 3.2 (remnants only) | Road still in use |
| 1 | Multiple sections alongside existing highway between Dirty Creek Range and Lemon Tree Road | 1928 | 2004 | 3.4 (remnants only) | Does not appear to be in use as roadway |
| 3 | Alipou Creek to Swan Creek, existence of remains unclear | 1928 | 1989 | - | - |
| 3 | Finlaysons Road and Wyatt Straight, Ulmarra | 1928 | 1991 | - | Road still in use. Includes original 1930s concrete surfacing |
| 3 | River Street, Ulmarra | 1928 | 1929 | - | Road still in use |
| 3 | Grafton Street and Clarence Street, Cowper | 1928 | 1993 | - | Road still in use |
| 4 | Shark Creek Bridge, arched bridge, west of existing highway crossing Shark Creek, Gulmarrad | 1935 | 1986 | - | Bridge remains intact but is not in use as roadway |
| 4 | O'Mara's Lane, Gulmarrad north and south of Shark Creek | 1928 | 1956 | - | Road still in use |
| 4 | O'Mara's Lane, Gulmarrad north and south of Shark Creek | 1956 | 1986 | - | Road still in use |
| 5 | River Street and Yamba Road, Maclean, south of Clarence River<br>Morpeth Street, Harwood, north of Clarence River | 1928 | 1966 | - | Road still in use |
| 5 | Chatsworth Road, Chatsworth | 1928 | 1986 | - | Road still in use |

| Project section | Bypassed section | Approximate date built* | Date bypassed | Approximate length (km) | Comments |
|---|---|---|---|---|---|
| 5 | Garrett's Lane, Mororo, west of existing highway | 1928 | 1935 | - | Punt crossing and associated roadway bypassed with construction of Mororo Bridge. Road still in use. |
| 5 | 1935 Mororo Bridge across Clarence River, existing highway<br>Old Pacific Highway, east of existing highway at Iluka Road intersection | 1935 | 1993 | - | Mororo bridge still in use for northbound highway traffic. |
| 6 | East of existing highway south of Tully Morgan Jacky Bulbin Road<br>West of existing highway north of Tully Morgan Jacky Bulbin Road | 1928 | 1986 | - | Does not appear to be in use as roadway |
| 7 | West of existing highway, 45.7-47.1 miles north of Grafton | 1928 | 1969 | - | Does not appear to be in use as roadway |
| 8 | Tuckombil Road, Woodburn, from Gap Road to Wondawee Way | 1928 | 1998 | - | Road still in use |
| 10 and 11 | River Street, Wardell, River Drive, Wardell, Burns Point Ferry Road, South Ballina | 1928 | 1964 | - | Road still in use |

* Note that while some segments of bypassed highway may have originally been constructed along the gazetted 1928 route, subsequent changes and maintenance to the physical material of the roadway may mean that there are no physical remains of the original road. The year 1928 is used as the date of construction based on the gazettal of State Highway No 10 between Hexham and Tweed Heads. Earlier remnants and physical evidence of earlier road construction may exist as the route likely follows earlier tracks and coach roads.

# 5. Impact assessment

## 5.1. No heritage impacts

### 5.1.1. No physical impact

Of the 30 items assessed as having heritage significance, ten would not be impacted by the project. These are listed in Table 5-1. Each of these sites would not be subject to direct impact as they are well outside the project boundary. Due to their distance from the project boundary they would also be unlikely to be subject to any indirect impacts.

**Table 5-1: Historical heritage items with no impacts.**

| Project section | Item no | Item name | Heritage significance |
|---|---|---|---|
| 1 | 3 | Tree stumps, Milleara/Halfway Creek | Local |
| 5 | 13 | 'Highfield' Residence, James Creek | Local |
| 5 | 14 | James Creek Residence, James Creek | Local |
| 5 | 15 | Harwood School Residence | Local |
| 5 | 16 | Harwood School | Local |
| 5 | 18 | Harwood Water Brigade Hall | Local |
| 5 | 37 | River Street Trees, Harwood | Local |
| 5 | 19 | Harwood War Memorial | Local |
| 7 | 24 | Vineyard Haven, New Italy Settlement | State |
| 10 | 30 | Bamboo stands, Properties 723 and 725, Wardell | Local |

### 5.1.2. Physical impact on property boundary, no impact on heritage significance

Of the 30 items assessed as having heritage significance, there are two where the project boundary would impact on the boundary of a heritage listed property, but would not impact on the significant heritage elements of the item. These are listed in Table 5-2. The heritage curtilage of each of these heritage items was defined during field investigations and is detailed in Appendix A.

**Table 5-2: Historical heritage items with impact within property boundary but no impact on heritage significance.**

| Project section | Item no | Item name | Heritage significance |
|---|---|---|---|
| 4 | 10 | Tyndale shed and cane barracks | Local |
| 8 | 25 | Woodburn Slaughterhouse, Trustrums Hill | Local |

## 5.2. Summary of impacts

Of the 30 items assessed as having heritage significance, 18 would be directly or indirectly impacted by the project. Most of the impacts would occur from the construction of the project, with operational impacts only occurring in a few instances. These are summarised in Table 5-3 and detailed in the following section.

**Table 5-3: Historical heritage items impacted by the project.**

| Project section | Item no | Item name | Heritage significance | Impact | Impact description | Project phase |
|---|---|---|---|---|---|---|
| 1 | 2 | House, sheds and stockyards, Halfway Creek | Local | Indirect | Physical damage due to contact with road construction materials. Architectural noise treatment to house. | Construction and Operation |
| 2 | 7 | Service station, Halfway Creek | Local | Direct and indirect | Direct impact on curtilage - destruction of subsurface archaeological deposits. Indirect impact on structures - physical damage due to vibration and/or contact with road construction materials. Architectural noise treatment to old residence. | Construction and Operation |
| 2 | 35 | Six Mile Tick Gate Remains, Glenugie | Local | Direct | Destruction of physical remains of site due to construction. | Construction |
| 2 | 36 | North Coast Railway Branch Tramway, Glenugie | Local | Direct | Destruction of small section of physical remains of site due to construction. | Construction |

| Project section | Item no | Item name | Heritage significance | Impact | Impact description | Project phase |
|---|---|---|---|---|---|---|
| 3 | 11 | Tyndale Residence | Local | Indirect | Visual, physical damage to property landscaping. Architectural noise treatment to house. | Construction and Operation |
| 4 | 12 | Maclean Punt and former Ashby ferry | Local | Indirect | Obscured view from roadside, physical damage due to vibration and/or contact with road construction materials. | Construction and Operation |
| 4 | 34 | Townsend residence | Local | Indirect | Architectural noise treatment. | Operation |
| 5 | 17 | Harwood Tram Tracks | Local | Direct | Physical damage due to construction traffic on Petticoat Lane Tram Tracks section. | Construction |
| 5 | 20 | Harwood Bridge | Local | Indirect | Visual. | Operation |
| 5 | 21 | Convent, 12 River St, Harwood | Local | Direct | Entire site demolished. | Construction |
| 5 | 32 | Harwood Heritage Conservation Area | Local | Direct | Demolition of structures within Heritage Conservation Area. | Construction |
| 7 | 23 | New Italy Settlement Landscape | State | Direct and indirect | Indirect impact on State Heritage Register curtilage - physical damage due to vibration and/or contact with road construction materials; reduction in visitor numbers due to removal of direct access.<br>Direct impact on Local environmental plan curtilage including Memorial and Stone-lined Well and Roder's Well and Mango Trees - demolition. | Construction and Operation |
| 9 | 26 | Maloney Property, Broadwater | Local | Direct and indirect | Buttery/creamery and dairy demolished. Architectural noise treatment to homestead. | Construction and Operation |

| Project section | Item no | Item name | Heritage significance | Impact | Impact description | Project phase |
|---|---|---|---|---|---|---|
| 9 | 38 | Cemetery Reserve, Broadwater | Local | Direct | Potential ground disturbance of subsurface features. | Construction |
| 9 | 28 | Byrne Property features, Broadwater | Local | Direct | Destruction of subsurface archaeological deposits and features.<br>Indirect impact on brick-lined well - physical damage due to vibration and/or contact with road construction materials. | Construction |
| 10 | 27 | Meerschaum Vale Brickworks | Local | Direct | Potential for destruction of subsurface archaeological deposits and features. | Construction |
| 10 | 29 | Stonehenge Property | Local | Direct and indirect | Demolition of main residence. Architectural noise treatment to 1940s residence. | Construction and Operation |
| Multiple | 33 | High Conservation Value Old Growth Forests | State | Direct | Clearing of trees. | Construction |

### 5.2.1. Impact on the historical infrastructure of the Pacific Highway

The historical infrastructure of the Pacific Highway includes pavement surfaces, culverts, bridges and associated evidence of construction. The project would have a physical impact on the remnants of earlier Pacific Highway infrastructure where it follows the existing highway alignment. This impact, however, has been an ongoing process during 80 years of highway maintenance. Despite the impact on the physical infrastructure, the project would retain evidence in the landscape of the original route. In sections of the project where the route deviates from the existing highway the existing sections of Pacific Highway would form part of local road network and remain in use. Details of the impacts on each of the known sections of earlier Pacific Highway infrastructure (noted in Table 4-2) are presented in Table 5-4.

The majority of the remaining evidence of the earlier highway route and infrastructure would not be impacted by the project. While in some instances the physical materials of the earlier highway remnants would be impacted, the route that the earlier highway took is well documented and would still be visible in the landscape. Overall the impact of the project on the heritage significance of the Pacific Highway is negligible. Therefore there are no mitigation measures required.

**Table 5-4: Impacts on historical infrastructure of the Pacific Highway.**

| Project section | Location/description /date | Earlier highway remnants | Impact on earlier highway route and materials |
|---|---|---|---|
| 1 | Wedding Bells deviation, Arrawarra Creek to Corindi Beach (1985) | Eggins Drive, Arrawarra, east of existing highway | Route not impacted. Materials impacted through upgrade as service road. |
| 1 | Corindi Beach bypass (1980) | Coral Street, Corindi Beach | Route and materials not impacted. |
| 1 | Cassons Creek bridge and realignment, Corindi (1953) | Blackadder Road, Corindi | Route and materials not impacted. |
| 1 | Dirty Creek to Halfway Creek deviation (1934) | None | n/a |
| 1 | Dirty Creek Range deviation (1987) | Dirty Creek Road, Dirty Creek<br>Falconers Lane, Dirty Creek | Route and materials not impacted.<br>Route and materials not impacted for Class A upgrade.<br>Route not impacted, but materials impacted for Class M upgrade to service road. |
| 1 | Dirty Creek Range to Lemon Tree Road realignment and duplication (2004) | Multiple sections alongside existing highway | Situated within Halfway Creek Upgrade Project boundary. Route not impacted but materials impacted for Class M upgrade. |
| 2 | Original alignment between Halfway Creek and Glenugie | Existing highway | Some sections of Class M upgrade would have an impact on existing route and materials, but most of the original/current route and materials would not be impacted. |
| 3 | Alipou Creek to Swan Creek deviation (1989) | Unclear | n/a |
| 3 | Swan Creek deviation (1991) | Finlaysons Road and Wyatt Straight, Ulmarra (including original 1930s concrete surfacing) | Route and materials not impacted. |
| 3 | Ulmarra realignment (1929) | Existing highway | Route and materials not impacted. |
| 3 | Cowper bypass (1993) | Grafton Street and Clarence Street, Cowper | Route and materials not impacted. |
| 4 | Shark Creek bridge (1935) | Arched bridge, west of existing highway crossing Shark Creek, Gulmarrad | Route and materials not impacted. |
| 4 | Shark Creek bridge northern approach realignment (1952) | O'Mara's Lane, Gulmarrad north and south of Shark Creek | Route and materials not impacted. |

| Project section | Location/description /date | Earlier highway remnants | Impact on earlier highway route and materials |
|---|---|---|---|
| 4 | Shark Creek Bridge and northern approach deviation (1986) | O'Mara's Lane, Gulmarrad north and south of Shark Creek | Route and materials not impacted. |
| 5 | Harwood Bridge and Maclean bypass (1966) | River Street and Yamba Road, Maclean, south of Clarence River<br>Morpeth Street, Harwood, north of Clarence River, including ferry landing | Route and materials of original highway in Maclean and Harwood would not be impacted.<br>1966 bypass route would not be impacted, but materials would be impacted by Class A upgrade.<br>Route and materials of Harwood Bridge would not be impacted. |
| 5 | Chatsworth deviation (1986) | Chatsworth Road, Chatsworth | Route and materials not impacted. |
| 5 | Mororo Bridge (1935) | Garrett's Lane, Mororo, west of existing highway | Route and materials not impacted. |
| 5 | Mororo Bridge, highway realignment and Iluka Road junction upgrade (1993) | 1935 Mororo Bridge across Clarence River, existing highway<br>Old Pacific Highway, east of existing highway at Iluka Road intersection | Route and materials of bridge not impacted.<br>Route of Old Pacific Highway not impacted. Materials south of Iluka Road would be impacted by Class A upgrade as service road.<br>Route and materials of Old Pacific Highway north of Iluka Road would not be impacted. |
| 6 | Tabbimoble Creek deviation (1986) | East of existing highway south of Tully Morgan Jacky Bulbin Road<br>West of existing highway north of Tully Morgan Jacky Bulbin Road | Route east and west of existing highway would not be impacted.<br>Materials of remnants to west of existing highway would be impacted by Class M upgrade for service road. |
| 7 | Deviation 45.7-47.1 miles north of Grafton (1969) | West of existing highway | Route would not be impacted.<br>Some materials of the remnants would be impacted by Class M upgrade for service road. |
| 8 | Gap Road realignment (1998) | Tuckombil Road, Woodburn, from Gap Road to Wondawee Way | Route not impacted. Materials of one small section of roadway at Woodburn interchange would be impacted by Class A upgrade. |
| 8 | Rileys Hill (possible) deviation | Rileys Hill Road | Route and materials not impacted. |

| Project section | Location/description /date | Earlier highway remnants | Impact on earlier highway route and materials |
|---|---|---|---|
| 9 | Broadwater to Wardell (original route) | Existing highway | Route and materials not impacted. |
| 10 and 11 | Wardell Bridge and deviation (1964) | River Street, Wardell, River Drive, Wardell, Burns Point Ferry Road, South Ballina | Route and materials not impacted. |

## 5.3. Cumulative impacts

### 5.3.1. Methodology

Cumulative impacts on the natural and cultural environment may be defined as "impacts that result from incremental changes caused by other past, present or reasonably foreseeable actions together with the project" (Walker and Johnston 1999:ii). Consideration of such impacts generally relies on a comprehensive understanding of the baseline data against which to measure change. In the case of cultural heritage, an understanding of the entire database of items of cultural heritage significance within a particular region, state or nation is still not a reality. This is due in part to the framework for the heritage listing of items tending to be an ad hoc process, at times driven by development pressures and community concerns rather than a systematic or strategic approach to recognising significant places in an area (Armstrong *et al.* 2003; Department of Environment Climate Change and Water 2009). Additionally, examining the cumulative impact of previous development in the region is difficult as there is no comprehensive data on these impacts and no readily accessible data on earlier baselines of the cultural heritage resource prior to other developments. Because of these limitations the discussion here is focussed upon the impact upon the current known cultural heritage resource of the region and the impacts of the current project.

The following discussion provides some indication of the cumulative impacts on the known and recorded historical heritage resource and the broader landscape and its character in the regions – the Mid North Coast and the Far North Coast regions – in which the project is situated.

The Mid North Coast Regional Strategy describes the region as a "typically Australian coastal location reflective of its early history as a series of fishing and timber-shipping ports" (Department of Planning 2009:3) The urban settlement of the region has focused on a number of urban centres linked directly or indirectly by the Pacific Highway (Department of Planning 2009:3). According to the Strategy "built heritage studies have been prepared for many of the towns and areas within the region. Most but not all of the items have been included in local environmental plans" (Department of Planning 2009:37). Many of these studies are due for review and renewal in order to better reflect "the many different types of heritage now recognised as contributing to the cultural landscape and sense of place of the Region" (Department of Planning 2009:37).

The Far North Coast Regional Strategy describes the region as "a region of villages" with around half of the population living in coastal or non-coastal villages, smaller communities, hamlets and rural areas (Department of Planning 2006:3). According to the Strategy "much of the heritage significance of this Region is not acknowledged in existing planning instruments" and one of the objectives of the Strategy is to ensure that the Far North Coast's historic and cultural landscapes are recognised and protected through the planning process (Department of Planning 2006:19).

This assessment of cumulative impacts has therefore focussed on the known historical heritage resource that is recorded and listed on the State Heritage Register, Local environmental plans and the NSW Roads and Maritime Services Section 170 Heritage and Conservation Register for the four local government areas within which the proposed upgrade is situated – Coffs Harbour City, Clarence Valley, Richmond Valley and Ballina Shire Councils. The assessment addresses these by firstly focussing on the number of places impacted within the particular suburbs/localities through which the project boundary passes, and secondly more broadly through an assessment by historical theme across the entirety of the four local government areas.

### 5.3.2. Cumulative impact assessment for historical heritage

There are four State Heritage Register-listed places located in the particular localities through which the project boundary passes. Two of these – New Italy Settlement Landscape and High Conservation Value Old Growth Forest – would be impacted by the project. It should be noted that there are only 18 State Heritage Register-listed places in the four local government areas spanned by the project. The two State Heritage Register-listed places would only be impacted in a minor way. The State Heritage Register-listed component of New Italy would be subject to indirect impacts under the class M upgrade. By implementing mitigation measures these impacts would be completely avoided or minimised while maintaining the heritage significance of the place. The State Heritage Register-listed High Conservation Value Old Growth Forest would be subject to minor direct impact with 0.001% of the total area being impacted in already marginal areas of the forest. The road design would minimise the impact while maintaining the heritage significance of the place.

The number of heritage places recorded in these areas, focussing specifically on the localities through which the project boundary passes, may be compared to the number of impacted heritage places by the project (Table 5-5). A total of 212 places are listed on Local environmental plans in the particular localities, with only nine of these impacted by the project. Of these nine places, three are impacts solely on property boundaries and not on the significance of the heritage items; three are indirect impacts that may be managed through mitigation measures; and only three are subject to direct impact involving destruction of the item (less than 1.5 per cent of the total Local environmental plan-listed places).

Only one place is recorded on the NSW Roads and Maritime Services Section 170 Register within these localities that is not already listed on a Local environmental plan. This place is not impacted by the project.

In addition to those places already listed on the State Heritage Register and Local environmental plans in the region, a number of additional unregistered places of significance have been identified as part of the overall historical heritage assessment process. To address these places in the assessment, directly impacted heritage places are identified below and an assessment made as to the existence and the legislative protection of similar types of places within the region.

**Table 5-5: Heritage places listed on local environmental plans and those subject to impact by the project, in particular localities through which project boundary passes.**

| Council area | Suburbs/localities within the project boundary | Number of Local environmental plan-listed heritage places | Number of heritage places impacted by project |
|---|---|---|---|
| Coffs Harbour City | Dirty Creek, Corindi, Corindi Beach, Arrawarra | 8 | 0 |
| Clarence Valley | Mororo, Woombah, Chatsworth Island, Harwood, James Creek, Townsend, Maclean, Gulmarrad, Tyndale, Shark Creek, Upper Coldstream, Tucabia, Pillar Valley, Lavadia, Glenugie, Wells Crossing, Halfway Creek, Milleara | 154 | 7 |
| Richmond Valley | Broadwater, Rileys Hill, Woodburn, Trustrums Hill, New Italy, Tabbimoble | 35 | 3 |
| Ballina Shire | Bagotville, Meerschaum Vale, Wardell, Coolgardie | 15 | 0 |

## Towns and villages

The majority of places listed on Local environmental plans and the State Heritage Register in the project region are buildings in towns and villages. The project boundary bypasses most towns and villages which in turn reduces the cumulative impacts on the main historical heritage place types in the landscape.

There is direct impact on the Harwood Convent (Item 21) within the Harwood Conservation Area which is an impact on the 'towns and villages' place type. This is the only place of this type to be impacted by the project. Examining in more detail the specific place type of the Convent as a religious place, there are many other religious places (churches, cemeteries etc) that are listed on the Local environmental plans and one listed on the State Heritage Register. There are two other convents protected on Local environmental plans in the project region – the Woodburn Convent and the Maclean Convent and Rectory.

The cumulative impact of the project on the historical thematic place type of 'towns and villages' would be low.

## Agricultural and pastoral

Heritage places related to agricultural and pastoral activities are those subject to the most impact from the project. Five places would be directly impacted by the project, which results from the project boundary being away from towns and villages and by the fact that agricultural and pastoral activities historically and continue to dominate the region. There are about 14 agricultural/pastoral places on the region's Local environmental plans including homesteads, sheep/cattle dips, fencing, farm buildings, stockyards, a silo, bails and a tank.

Those impacted agricultural and pastoral places include the important regional industries of sugar cane growing (eg Byrne property – Item 28) and dairying (eg Maloney property – Item 26 and Stonehenge property – Item 29). The number of Local environmental plan-listed places related to

dairying throughout the entire project region is low. These include two butter factories (Coffs Harbour and Lower Southgate) and one dairy and bails at Stockyard Creek. While some of the homesteads noted above may be related to the dairy industry, given the small scale, family-based nature of the industry, this may not necessarily be the case. The direct impact of the project to the dairy and creamery at the Maloney property and the house at the Stonehenge property, is a substantial cumulative impact on the heritage of dairying in the region; a place type that appears to be under-represented in the current Local environmental plan listings.

The representation of another important industry in the region – sugar cane growing and sugar production – is also low with very few sugar-specific places listed on the Local environmental plans for the region. Only four sugar places – Tyndale Cane Barracks, a cane grab at Broadwater, and three sets of tramway lines (likely related to sugar) at Iluka, Empire Vale and Coffs Harbour. The additional three sections of cane tram tracks in Harwood would either not be directly impacted or are able to be protected from direct impact from the project. Again some of the homesteads noted above may be related to the farming of sugar, but this is not clear. The direct impact on the area of the Byrne property (Item 28) where the cane cutters and cane farm workers resided is a substantial cumulative impact on an already underrepresented historical theme for the region.

The other agricultural/pastoral heritage places are those at the New Italy Settlement Landscape (Item 23) which were the scene of a variety of agricultural and pastoral pursuits and are equally important for their relationship to migrant contributions to the region. Of the two State Heritage Register-listed components of the New Italy Settlement Landscape, one would not be impacted by the project. The second would be subject to indirect impacts particularly through the proposed change of access to visitors to the New Italy Museum Complex under the class M upgrade. Those indirect impacts due to vibration and dust from construction could be managed. The two Local environmental plan-listed components of New Italy which are directly impacted by the project are the Memorial and Stone-lined Well (I150), and Roder's Stone-lined Well and Mango Trees (I149). The direct impact to the memorial can be mitigated through its relocation, while indirect impacts to the well may also be managed. Roder's well and mango trees would however be destroyed by the proposed project. There are several other wells situated elsewhere at the New Italy Settlement Landscape, and there are at least four other wells listed on the region's Local environmental plans. The cumulative impact on wells (an important item related to agriculture and pastoralism) through the destruction of Roder's Well is moderate. Detailed archaeological investigation of Roder's Well and the future protection of the other examples both at New Italy and elsewhere would minimise the cumulative impact on this finite heritage resource and potentially provide information which would enhance knowledge of the agricultural and pastoral history of the area.

### Migrant contributions

In addition to being related to agriculture and pastoralism, the New Italy Settlement Landscape are a key heritage place in telling the history of the contribution of non-British migrants to the region. The direct impacts on the Local environmental plan-listed components of the New Italy Settlement Landscape are not minor, with two key components being affected. Additionally the State Heritage Register-listed component – the New Italy Museum Complex – would be adversely impacted through the proposed M Class upgrade, which would likely result in the decline of visitor traffic to the Complex. Given the uniqueness of the New Italy Settlement Landscape in the region and the state the cumulative impacts on the site are high. The management of impacts through a salvage archaeological investigation of Roder's well and the relocation of the memorial would contribute towards reducing those impacts. The future protection and management of the remainder of the New Italy Settlement Landscape is paramount in maintaining the cumulative impact on the site to an acceptable threshold.

### Brickmaking

The Meerschaum Vale Brickworks site (Item 27) may potentially be impacted by the upgrade project. There are three other brickworks sites protected by Local environmental plan listing in the project region, at Broadwater, Maclean and South Grafton. These three sites are of much greater integrity and the remains more substantial than those that are likely to exist at Meerschaum Vale. As such, the cumulative impact on brickmaking places due to the potential impact on this site is limited.

### Transport

The overall impact on the historical infrastructure of the Pacific Highway as a heritage item would be low with the majority of the remaining evidence of the earlier highway route and infrastructure not impacted by the project. Additionally, the representation of transport infrastructure as a place type throughout the project region is high. There are at least 22 transport-related sites listed on the region's Local environmental plans including roads, road bridges, rail bridges, road tunnels, ferry approaches and landing sites (most related to the Pacific Highway route), river crossings, wharfs, and dry docks. There are also seven road bridges listed on the NSW Roads and Maritime Services Section 170 Register in the region. Given this, the cumulative impact on transport infrastructure heritage is low.

## 5.3.3. Impacts of other Pacific Highway Upgrade Projects

A total of 35 heritage items have been impacted by other projects which make up the Pacific Highway Upgrade Program (PHUP) other than the Woolgoolga to Ballina Upgrade (Table 5-6). The types of heritage items include towns and villages, road and river transport, farming and pastoral, mining and quarrying, and communications.

## 5.3.4. Summary of cumulative impact

Overall, the cumulative impact of the project on the historical heritage of the project region is low. Of the listed heritage sites in specific suburbs/localities through which the project boundary runs, three of 212 Local environmental plan-listed sites (less than 1.5 per cent) and two of four State Heritage Register-listed sites would be impacted in a minor way without impacting their heritage significance.

The cumulative impact by type of place in the overall region (the four local government areas) is low for places related to towns and villages, brickmaking and transport. The cumulative impacts on agricultural and pastoral sites is generally moderate but increases to a high level when considering the specific industries of dairying and sugar cane farming. Both are historically important industries in the region and places associated with these industries are under-represented on heritage registers. The cumulative impact on sites related to non-British migrants is also high, due to the very low number sites of this type being listed on heritage registers.

The cumulative impact of the previous PHUP projects as a whole is also relatively low, with 35 heritage items identified as being subject to direct or indirect impacts for projects where data was available. The types of heritage items impacted are similar to those identified for the Woolgoolga to Ballina upgrade - towns and villages, transport, farming and pastoral sites - however this is reflective of the character of the rural and regional areas through which the Pacific Highway passes along the majority of its length.

**Table 5-6: Impacts on historical heritage items in Pacific Highway Upgrade Program (PHUP).**

| Project | Assessment source | Number of significant heritage items impacted | Impacts | Place types | Mitigation measures |
|---|---|---|---|---|---|
| **Projects completed** | | | | | |
| Raymond Terrace bypass duplication | Not available | | | | |
| Raymond Terrace to Karuah | Not available | | | | |
| Karuah Bypass | Not available | | | | |
| Karuah to Bulahdelah | Not available | | | | |
| Bulahdelah to Coolongolook | Not available | | | | |
| Wang Wauk to Bundacree | Not available | | | | |
| Bundacree Creek to Possum Brush | EIS summary brochure | 3 | Direct impact<br>Indirect impact | Towns and villages | Archival recording<br>Retaining trees as visual screen<br>Consideration of relocation of building for use as museum |
| Coopernook Bypass | EIS 2000<br>Assessment of design change 2006 | 1 | Direct impact | Towns and villages | Archival recording<br>Relocation of building |
| Coopernook to Moorland | Not available | | | | |
| Moorland to Herons Creek | | 0 | | | |
| Bonville Bypass | EIS | 0 | | | |
| Lyons to England Road | Not available | | | | |
| Halfway Creek | Not available | | | | |
| Tandy's Lane Upgrade | Not available | | | | |

| Project | Assessment source | Number of significant heritage items impacted | Impacts | Place types | Mitigation measures |
|---|---|---|---|---|---|
| Brunswick Head Bypass | Not available | | | | |
| Brunswick to Yelgun | Not available | | | | |
| Yelgun to Chinderah | Not available | | | | |
| Glenugie Upgrade | EIS | 1 | Direct impact | Road and river transport | Photographic archival record<br>Archaeological monitoring |
| Ballina Bypass | EIS | 3 | Direct impact | Farming and pastoral<br>Road and river transport | No information available |
| Banora Point Upgrade | EIS | 2 | Direct impact | Farming and pastoral<br>Road and river transport | Change in detailed design<br>Archival recording<br>Interpretation<br>Restoration |
| **Projects recently approved or currently under construction** | | | | | |
| Bulahdelah Bypass | EIS | 5 | Direct impact<br>Indirect impact | Farming and pastoral<br>Road and river transport<br>Mining and quarrying | Change in detailed design<br>Protective fencing<br>Interpretation<br>Specific conservation management plan for one item including archaeological excavation |
| Kempsey to Eungai | EIS | 3 | Direct impact<br>Indirect impact | Towns and villages<br>Farming and pastoral | Change in detailed design<br>Archival recording<br>Interpretation<br>Provision of maintenance and repair for memorial trees |

| Project | Assessment source | Number of significant heritage items impacted | Impacts | Place types | Mitigation measures |
|---|---|---|---|---|---|
| Sapphire to Woolgoolga Upgrade | EIS | 3 | Direct impact | Farming and pastoral<br>Road and river transport<br>Communications | Archival recording |
| Tintenbar to Ewingsdale | EIS | 3 | Direct impact<br>Indirect impact | Farming and pastoral | Archival recording<br>Possible specific conservation management plan |
| Devils Pulpit Upgrade | EIS | 0 | | | |
| Oxley Highway to Kempsey | EIS | 5 | Direct impact<br>Indirect impact | Road and river transport<br>Farming and pastoral - dairy<br>Farming and pastoral - general<br>Timber | Change in detailed design<br>Protective fencing<br>Archaeological excavation and assessment |
| Warrell Creek to Urunga | EIS | 6 | Direct impact<br>Indirect impact | Road and river transport<br>Farming and pastoral | Protective fencing<br>Archival recording<br>Archaeological assessment, recording and historical research<br>Relocation of water pump |
| **Projects in the planning phase** | | | | | |
| F3 to Raymond Terrace | Preferred route report | 0 | | | |
| Coffs Harbour Bypass | Not available | | | | |
| Woolgoolga to Ballina | | 18 | Direct impact<br>Indirect impact | Towns and villages<br>Farming and pastoral<br>Migrant contributions<br>Road and river transport | Detailed design features<br>Protective fencing/covering<br>Noise controls<br>Archaeological excavation<br>Archival photographic recording<br>Relocation of memorial |

| Project | Assessment source | Number of significant heritage items impacted | Impacts | Place types | Mitigation measures |
|---|---|---|---|---|---|
| | | | | | Detailed vibration assessment<br>Dilapidation/condition survey |

## 5.4. Statements of Heritage Impact

A Statement of Heritage Impact (SOHI) is used to identify what impact a development proposal would have on a heritage item. A SOHI, together with supporting information, addresses:

- Why the item is of heritage significance
- What impact the proposed works would have on that significance
- What measures are proposed to mitigate negative impacts
- Why more sympathetic solutions are not viable (NSW Heritage Office 1996).

In accordance with the Director-General's requirements for this project, SOHIs have been prepared for all State or locally significant historical heritage items impacted. The following 18 heritage items would be either directly or indirectly impacted by the project. The SOHIs have been prepared in accordance with the NSW Heritage Office (1996b) Statements of Heritage Impact guidelines. Appendix A provides full site description, photographs and significance assessments for all the heritage items included within the SOHIs.

### 5.4.1. Item 2: House, Sheds and Stockyards, Milleara

#### Site details

Item 2 is located adjacent to the Pacific Highway, on the eastern side of the road, at Milleara, on Lot 9 DP707325, in project Section 1. The site was identified by Kuskie and Carter (2007). The site is of local significance as it meets **criterion A** (important in the pattern of NSW's history) and **criterion E** (potential to yield information). See Appendix A.2 for full site description, photographs and significance assessment.

#### Proposed works

The project boundary would be located adjacent to the item on the western side with some overlap of the curtilage in the north-west corner of the curtilage near the stockyards. The project follows the existing Pacific Highway and would extend to the west to accommodate a dual carriageway. The assessed design has the road batter formation located approximately ten metres west of the stockyards.

This SOHI has been prepared by Rachael Loizou (Archaeologist, SKM).

#### Impact assessment

*The following aspects of the proposal respect or enhance the heritage significance of the item for the following reasons:*

The project boundary has been designed to minimise direct impact to the curtilage of the heritage item, with no impacts on the curtilage boundary of the house, sheds and stockyards.

*The following aspects of the proposal could detrimentally impact on heritage significance. The reasons are explained as well as the measures to be taken to minimise impacts following project approval:*

The heritage significance of the items may be indirectly impacted by the construction works. Indirect impacts on the physical fabric of the heritage items would detrimentally affect the condition of the house, sheds and stockyards and therefore their historical significance and research potential. The following indirect impacts are considered likely:

- Construction of the batter slope may cause damage to the stockyards due to the close proximity of the project through physical impact by machinery. As a protective measure a temporary barrier fence would be erected between the stockyards and the works area prior to road construction works commencing. The fence would remain in place until the conclusion of the works in the vicinity of the items at which time it would be removed. A batter slope would not be constructed within five metres of the stockyards

- Physical damage to the stockyards if road construction materials blow or spill onto them. To protect the stockyards and reduce their exposure to road construction materials, particularly dust, the mitigation measures for maintaining air quality and dust control as detailed in the proposed air quality management plan would be implemented. This plan would address spoil and stockpile handling, machinery operating procedures and monitoring of impacts. Sediment control would also be put in place in between the road and the stockyards prior to road construction works commencing and would remain in place until the conclusion of the works in the vicinity of the stockyard, at which time it would be removed.
- The house has been identified for architectural noise treatment to control noise levels from the highway. Architectural treatment could include a range of noise controls. These noise controls are generally considered to be the most cost-effective solution for isolated residents where noise barriers and/or low-noise pavements are not feasible. Examples generally include sealing off wall vents, upgrading windows, glazing and solid core doors within the noise exposed façade(s). Also, providing air conditioning or ventilation systems to meet the Building Code of Australia requirements for fresh air is a further example of a control measure that could be used at an affected property. For these measures to be effective, the property must be in a reasonable state of repair. The noise controls would be developed in consultation with a qualified heritage consultant to minimise impacts on the heritage significance of the item. A more detailed SOHI would be prepared when the specific architectural noise treatments for the house are identified.
- There are no known or suspected archaeological deposits within the property boundary therefore no further archaeological investigations are recommended.

By implementing these mitigation measures the potential impacts on the heritage item would be avoided.

### 5.4.2. Item 7: Service Station Complex, Halfway Creek

#### Site details

Item 7 is situated on the Pacific Highway, Halfway Creek, north of the intersection with Kungala Road, on Lot 411, DP883976, in Section 2. The site comprises the former Halfway Creek Wine Bar/Restaurant (also the site of a coaching waystation), a cottage and potential archaeological remains of the former coaching waystation and stables. The site was identified by Kuskie and Carter (2007) and is of local heritage significance and meets **criterion A** (important in the pattern of NSW's history), **criterion D** (strong or special associations with a particular community or cultural group) and **criterion E** (potential to yield information). The site is not currently listed on any national, state or local heritage register or list. See Appendix A.7 for full site description, photographs and significance assessment.

#### Proposed works

The project boundary would run along the current road frontage of the service station complex. The initial class A upgrade at this location includes construction of a new alignment on the eastern side of the existing highway, on the opposite side of the existing highway from the service station complex. The class M upgrade follows the existing highway with a batter slope encroaching onto the existing carpark area of the service station complex.

This SOHI has been prepared by Karen Murphy (Archaeologist, SKM).

#### Impact assessment

*The following aspects of the proposal respect or enhance the heritage significance of the item for the following reasons:*

The project boundary has been designed to minimise direct impacts on the property and the curtilage of the heritage item. This design would retain the majority of the site intact, including the buildings, and therefore also retain its historical and associative significance. There would be no direct impacts from the construction of the class A upgrade.

*The following aspects of the proposal could detrimentally impact on heritage significance. The reasons are explained as well as the measures to be taken to minimise impacts following project approval*:

- Ground disturbance during road construction of the class M upgrade, particularly batter slope on existing carpark area. While the remains of the original coach waystation are believed to be underneath the existing bar/restaurant building, sub-surface remains of the original building may extend underneath the carpark area towards the existing highway. Additionally, remnants of the early coach road may also exist under the carpark area. The project may have a direct impact on these through ground disturbance during construction reducing the site's high potential for archaeological research. The impacts would be mitigated through the

opportunity to undertake salvage archaeological investigation in the carpark area between the building and the existing highway. Salvage archaeological investigations at the site would be undertaken as follows:

  - Salvage excavation to be undertaken in an area extending from the project boundary running along the front of the complex buildings to the edge of the existing highway prior to construction commencing in the vicinity of the heritage item (Area of Archaeological Potential on Figure 7-28)
  - Salvage excavation to be undertaken in accordance with the Heritage Branch of the Office of Environment and Heritage guidelines including an appropriate research design and methodology in order to best realise the research potential of this area of the site
  - Salvage excavation undertaken under the supervision of an appropriately qualified and experienced historical archaeologist in accordance with Heritage Branch criteria.

- Construction of the batter slope for the class M upgrade may cause damage to the bar/restaurant building due to the close proximity of the project. As a protective measure a temporary barrier fence would be erected between the bar/restaurant building and the works area prior to road construction works commencing in the vicinity of the heritage item. The fence would remain in place until the conclusion of the road works at which time it would be removed. The batter slope would not be constructed within eight metres of the bar/restaurant building
- Physical damage to the bar/restaurant building if road construction materials blow or spill onto it, during class M upgrade construction. To protect the building and reduce its exposure to road construction materials, particularly dust, the mitigation measures for maintaining air quality and dust control as detailed in the proposed air quality management plan would be implemented. This plan would address spoil and stockpile handling, machinery operating procedures and monitoring of impacts. Sediment control would also be put in place in between the road and the stockyards prior to road construction works commencing and would remain in place until the conclusion of the works in the vicinity of the stockyard, at which time it would be removed
- While vibration caused during construction is unlikely to damage the structural integrity of the bar/restaurant building during the class M upgrade, a photographic dilapidation survey would be undertaken of the current condition and damage to the bar/restaurant building prior to construction commencing in the vicinity. In the unlikely event of damage caused during construction this would be repaired once construction is complete.
- The old residence has been identified for architectural noise treatment to control noise levels from the highway. Architectural treatment could include a range of noise controls. These noise controls are generally considered to be the most cost-

effective solution for isolated residents where noise barriers and/or low-noise pavements are not feasible. Examples generally include sealing off wall vents, upgrading windows, glazing and solid core doors within the noise exposed façade(s). Also, providing air conditioning or ventilation systems to meet the Building Code of Australia requirements for fresh air is a further example of a control measure that could be used at an affected property. For these measures to be effective, the property must be in a reasonable state of repair. The noise controls would be developed in consultation with a qualified heritage consultant to minimise impacts on the heritage significance of the item. A more detailed SOHI would be prepared when the specific architectural noise treatments for the residence are identified.

By implementing these mitigation measures the potential impacts on the bar/restaurant building would be avoided. Implementing the mitigation measure in the existing carpark area east of the bar/restaurant building would realise the research potential of the heritage item (criterion E) and contribute information towards understanding its overall heritage significance.

### 5.4.3. Item 11: Tyndale Residence, Tyndale

#### Site details

Item 11 (Tyndale Residence) is situated at 2861 Pacific Highway, Tyndale on Lot 2 DP586049 in Section 3. The site comprises a large Victorian residence and mature tree plantings. The property is listed on the draft Clarence Valley Local Environmental Plan (2010) and the State Heritage Inventory as item 1990072. The item has been assessed as having local heritage significance, meeting **criterion C** (demonstrating aesthetic characteristics and/or a high degree of creative or technical achievement). See Appendix A.11 for full site description, photographs and significance assessment.

#### Proposed works

The project in the vicinity of the property includes a class M upgrade with an interchange at Tyndale, which involves cutting into the hillside adjacent to the eastern boundary of the Tyndale Residence property. The approximate length of the cut is 485 metres and the depth of the cut is 20 metres.

This SOHI has been prepared by Rose Reid (Archaeologist, SKM).

#### Impact assessment

*The following aspects of the proposal respect or enhance the heritage significance of the item or conservation area for the following reasons:*

- The proposal has been designed to minimise direct impacts on the property and the curtilage of the heritage item. All works are proposed outside the Tyndale Residence property boundary
- The architectural significance of the house would not be impacted by the project as the distance to the project from the house is greater than 100 metres. Access to and appreciation of the heritage architectural elements of the building would not be affected and would be managed in accordance with the NSW Roads and Maritime Services guidelines for urban planning Beyond the Pavement (RTA 2009a).

*The following aspects of the proposal could detrimentally impact on heritage significance. The reasons are explained as well as the measures to be taken to minimise impacts following project approval:*

- Potential impacts on views from the house towards the hill to the east of the property where the cut batter would be visible from the house. This impact would continue during operation of the project following construction. Any visual impacts are likely to be reduced by the existing mature trees planted around the property

and the significant screening of vegetation between the rear of the house and the proposed location of the works

- Potential impacts on the mature bunya trees would be managed during the works. Prior to the start of works, the location and condition of the bunya trees would be recorded by an arborist. In consultation with an arborist, protective fencing would be erected to avoid impacts to any trees that might be adjacent to the property boundary
- There are no known or suspected archaeological deposits within the property boundary therefore no further archaeological investigations are proposed.
- The residence has been identified for architectural noise treatment to control noise levels from the highway. Architectural treatment could include a range of noise controls. These noise controls are generally considered to be the most cost-effective solution for isolated residents where noise barriers and/or low-noise pavements are not feasible. Examples generally include sealing off wall vents, upgrading windows, glazing and solid core doors within the noise exposed façade(s). Also, providing air conditioning or ventilation systems to meet the Building Code of Australia requirements for fresh air is a further example of a control measure that could be used at an affected property. For these measures to be effective, the property must be in a reasonable state of repair. The noise controls would be developed in consultation with a qualified heritage consultant to minimise impacts on the heritage significance of the item. A more detailed SOHI would be prepared when the specific architectural noise treatments for the residence are identified.

By implementing these mitigation measures the potential impacts on the heritage item would be avoided.

### 5.4.4. Item 12: Cane Barge, Former Ashby Ferry and Sugarcane Hoist, Maclean

#### Site details

Item 12 is situated alongside the Pacific Highway in Ferry Park, Maclean on Lot 434 DP823599 in Section 4. The site was identified by Kuskie and Carter (2007) and is of local heritage significance as it meets **criterion A** (important in the pattern of NSW's history), **criterion E** (potential to yield information), **criterion F** (uncommon or rare) and **criterion G** (principal characteristics of a class). See Appendix A.12 for full site description, photographs and significance assessment.

#### Proposed works

The project includes the construction of an interchange at Maclean with the access road to the interchange following the current alignment of the Pacific Highway to the east of the heritage item. The batter slope for the access road would be situated approximately 8.5 metres east of the ferry and approximately 18.5 metres east of the cane barge.

This SOHI has been prepared by Rachael Loizou (Archaeologist, SKM).

#### Impact assessment

*The following aspects of the proposal respect or enhance the heritage significance of the item for the following reasons:*

The proposed upgrade has been designed to minimise direct impact on the curtilage of the heritage items. All works are proposed outside the curtilage boundary of the cane barge, former Ashby ferry and sugarcane hoist.

*The following aspects of the proposal could detrimentally impact on heritage significance. The reasons are explained as well as the measures to be taken to minimise impacts following project approval:*

The project would not have a direct impact on Item 12, however the heritage significance of the items may be indirectly impacted by the construction works. Indirect impacts on the physical fabric of the heritage items would detrimentally affect their condition and therefore their historical significance, educational value and representativeness. The following indirect impacts are considered likely:

- A reduction in the number of visitors to the site as a result of the view of the heritage items from the road being obscured by the project batter slope. This would, in turn, reduce the educational value of the heritage items. This impact would continue during the operation of the project following construction. The installation of signage on both the northbound and southbound highway approach to Maclean interchange would help visitors locate the heritage item

- While vibration caused during construction is unlikely to damage the structural integrity of the heritage items, a photographic dilapidation survey would be undertaken of the current condition and damage to the heritage items prior to construction commencing in the vicinity. In the unlikely event of damage caused during construction this would be repaired once construction is complete
- Physical damage to the exterior surfaces of each heritage item if road construction materials blow or spill onto the heritage items. To protect the heritage items and reduce their exposure to road construction materials, particularly dust, the mitigation measures for maintaining air quality and dust control as detailed in the proposed air quality management plan would be implemented. This plan would address spoil and stockpile handling, machinery operating procedures and monitoring of impacts. Sediment control would also be put in place in between the road and the stockyards prior to road construction works commencing and would remain in place until the conclusion of the works in the vicinity of the stockyard, at which time it would be removed
- There are no known or suspected archaeological deposits within the property boundary therefore no further archaeological investigations are proposed.

By implementing these mitigation measures the potential impacts on the heritage item would be avoided.

### 5.4.5. Item 17: Harwood Tram Tracks, Harwood

#### Site details

Item 17 comprises two sections of tramway track within the town of Harwood in Section 5. The Old Pacific Highway Tram Tracks and the Petticoat Lane Tram Tracks are located in Harwood on road reserves. The Old Pacific Highway Tram tracks were identified by Navin Officer (2009b) and are listed in the Clarence Valley Local Environmental Plan (2011). The Petticoat Lane Tram Tracks were identified during this assessment by SKM (2011). They are not listed items but are situated within the Harwood Heritage Conservation Area, identified in the Clarence Valley Local Environmental Plan (2011). Both sections of track appear to be part of the same tram track associated with the Harwood Mill. The tram tracks are of local heritage significance and meet **criterion A** (important in the pattern of NSW's history) and **criterion F** (uncommon or rare). See Appendix A.17 for full site description, photographs and significance assessment.

#### Proposed works

The project would be on the eastern side of the current highway and include the construction of a new bridge across the Clarence River around 25 metres east of the existing Harwood Bridge.

This SOHI has been prepared by Rachael Loizou (Archaeologist, SKM).

#### Impact assessment

*The following aspects of the proposal respect or enhance the heritage significance of the item for the following reasons:*

The project boundary would avoid direct impacts on the curtilage of the Old Pacific Highway Tram Tracks. All works and bridge construction works are proposed outside the curtilage boundary of the Old Pacific Highway Tram Tracks section.

*The following aspects of the proposal could detrimentally impact on heritage significance. The reasons are explained as well as the measures to be taken to minimise impacts following project approval:*

- Construction traffic associated with the proposed bridge construction works would have a direct impact on the curtilage of the Petticoat Lane Tram Tracks section. The direct impacts on this section of tram tracks would detrimentally affect their condition and historical significance. Complete destruction of the tram tracks would increase the rarity of this site type. To protect the Petticoat Lane Tram Tracks section during bridge construction works, the tram tracks would have a protective covering placed over them, for example, a geo textile fabric and heavy duty metal sheeting or similar. The covering would be secured in place prior to road

construction works commencing and would remain in place until the conclusion of the works in vicinity of the heritage item at which time it would be removed

### 5.4.6. Item 20: Harwood Bridge, Harwood

#### Site details

Item 20 forms part of the Pacific Highway over the Clarence River at Harwood in Section 5. The site includes the entire extent of the bridge including footings and abutments. The site was identified by Gardiner (2006) and is of local heritage significance as it meets **criterion A** (important in the pattern of NSW's history), **criterion C** (demonstrating aesthetic characteristics and/or a high degree of creative or technical achievement) and **criterion G** (principal characteristics of a class). The Harwood Bridge is not currently listed on any heritage register or list. See Appendix A.20 for full site description, photographs and significance assessment.

#### Proposed works

The project includes the upgrade of the highway either side of the Clarence River to dual carriageway and construction of a new bridge across the river around 25 metres east of the existing Harwood Bridge. The project design includes a half interchange at Yamba and at Watts Lane. This means that the existing Harwood Bridge would be used as the local traffic service road. The proposed bridge would be used by traffic travelling though the area, including the majority of heavy vehicles. This would result in less physical wear on the existing bridge and the continued maintenance of the existing bridge as a key element of the class M interchange system.

This SOHI has been prepared by Rachael Loizou (Archaeologist, SKM).

#### Impact assessment

*The following aspects of the proposal respect or enhance the heritage significance of the item for the following reasons:*

The project has been designed to avoid direct impacts on the curtilage of the Harwood Bridge. All works are proposed outside the curtilage boundary of the Harwood Bridge. The project would involve the existing bridge being used to accommodate traffic on the local service road with a new four lane bridge being built to accommodate the upgraded highway. The continued use of the Harwood Bridge within the road network would respect and maintain its heritage significance as a functional example of the last steel truss bridge constructed in NSW.

*The following aspects of the proposal could detrimentally impact on heritage significance. The reasons are explained as well as the measures to be taken to minimise impacts:*

The project would not have a direct impact on the Harwood Bridge, however the heritage significance of the item may be indirectly impacted by the close proximity of the proposed new bridge and associated visual impacts. The following visual impacts are considered likely:

- South-western bank of Clarence River. View behind Harwood Bridge would be of the new bridge instead of the current view of the river and riverbanks

- North-western bank of Clarence River. View behind Harwood Bridge would be of the new bridge instead of the current view of the river and mangroves
- North-eastern bank of River. Current view of the Harwood Bridge would be obscured by the new bridge.

These impacts would continue during operation of the project following construction and would reduce the aesthetic significance of the heritage item by obscuring the view of the bridge from most angles. The new bridge would have a very strong visual presence on the river and there are difficulties in providing a form that would be sympathetic to the existing bridge. Embankments and approach structures to the new bridge would be visible above cane fields and out of scale with the surrounding streets and buildings within Harwood village. The quality of views to the existing bridge from the village would be compromised by the new bridge (RTA 2009b).

Two alternative alignments over the Clarence River, one upstream (west of the current Harwood Bridge) and one downstream (further east of the current Harwood Bridge) were assessed as part of the route options phase of the project (RTA 2009b:x). The investigation concluded that there would be no real benefit gained from either alternative alignment in terms of social, environmental or functional factors, and that the alternatives would increase the area affected by the upgraded highway (RTA 2009:x). The main advantages of the proposed option over other assessed alternatives are:

- Relatively minor impacts on cane farms
- Minor risk of impacts on shipping activity in the Clarence River
- Relatively minor impacts on endangered ecological communities and mangroves.

The design of the new bridge would be undertaken in accordance with *Bridge Aesthetics: Design Guidelines to Improve the Appearance of Bridges in NSW* (RMS 2012) with specific reference to the section 7.1, *New bridges next to existing bridges*. This would contribute towards the mitigation of visual and aesthetic impacts on the existing Harwood Bridge.

### 5.4.7. Item 21: Convent, Harwood

#### Site details

Item 21 is situated at 12-14 River Street, Harwood, on Lot 1DP230181 in Section 5. The site comprises a 1920s timber building now divided into two separate residences and surrounding yard. The site was identified by Gardiner (2006) as part of the Harwood Heritage Conservation Area and recommended for listing on the Clarence Valley Local Environmental Plan. The site is not listed individually on the Clarence Valley Local Environmental Plan (2011) but is part of the Local environmental plan-listed Harwood Heritage Conservation Area. The site is of local heritage significance as it meets **criterion A** (important in pattern of NSW's history). See Appendix A.21 for full site description, photographs and significance assessment.

#### Proposed works

The project would include the duplication of the crossing of the Clarence River to the east of the existing Harwood Bridge. The project would require the demolition of the Convent building to allow placement of the bridge piers and road embankment directly at the current location of Item 21. Ancillary site 3a (Section 5) would also be situated in this location.

This SOHI has been prepared by Karen Murphy (Archaeologist, SKM).

#### Impact assessment

*The following aspects of the proposal respect or enhance the heritage significance of the item for the following reasons:*

The project would involve the complete demolition of the Convent building for construction of the bridge across the Clarence River. There are no aspects of the project which enhance or respect the heritage significance of the heritage item.

*The following aspects of the proposal could detrimentally impact on heritage significance. The reasons are explained as well as the measures to be taken to minimise impacts following project approval:*

The project would involve the complete demolition of the Convent building for construction of the bridge across the Clarence River. This would detrimentally impact the historical significance of the heritage item. Two alternative alignments over the Clarence River, one upstream (west of the current Harwood Bridge) and one downstream (further east of the current Harwood Bridge) were assessed as part of the route options phase of the project (RTA 2009b:x). The investigation concluded that there would be no real benefit gained from either alternative alignment in terms of social, environmental and functional factors, and that the alternatives would increase the area affected by the upgraded highway (RTA 2009:x). The main advantages of the proposed option over other assessed alternatives are:

- Reduced impacts on cane farms
- Reduced impacts on shipping activity in the Clarence River
- Reduced impacts on endangered ecological communities and mangroves.

The impacts on the town of Harwood would be mitigated as a narrower road corridor has been included in the proposed design. The proposed project directly impacts on fewer houses than alternatives previously explored (RTA 2009:12).

Discussions with community members indicate that the relocation of the Convent would be highly regarded by the community. To maintain the Convent's local heritage significance the building would be relocated to an appropriate site elsewhere within the boundaries of the Harwood Heritage Conservation Area in consultation with the community. NSW Roads and Maritime Services have acquired land in Harwood which may be suitable for relocation of the Convent building. The relocation would be undertaken by an appropriately qualified house removal contractor in consultation with an appropriately qualified heritage consultant. Archival photographic recording would be made of the heritage item and its surrounds in accordance with the Heritage Branch of the OEH guidelines prior to its relocation.

There are no known or suspected archaeological deposits within the property boundary therefore no further archaeological investigations are proposed.

By implementing these mitigation measures the historical significance of the heritage item would be maintained.

### 5.4.8. Item 23: New Italy Settlement Landscape, New Italy

## Site details

Item 23 (New Italy Settlement Landscape) are situated at New Italy in Section 7. The New Italy Settlement Landscape is a complex comprising a number of components and sites which are listed on a combination of the State Heritage Register for their state significance and the Richmond Valley Local Environmental Plan (2012) for their local significance (Table 5-7 and Figure 5-1).

The State Heritage Register-listed New Italy Settlement is identified as part of the broader cultural landscape of New Italy and is significant at the state level for its historical (**criterion A**), associative (**criterion B**), aesthetic (**criterion C**), and social significance (**criterion D**) and its research potential (**criterion E**), rarity (**criterion F**) and representativeness (**criterion G**). It is also noted as being significant for the intactness and integrity of the physical (archaeological) remains. The State Heritage Register listing recommends that the state-listed part of the site should be considered as part of the broader New Italy landscape[3] which contains archaeological evidence of wells, cellars, domestic buildings and artefacts, a church and plantings of fruit and pine trees.

**Table 5-7: Summary of components of New Italy Settlement Landscape.**

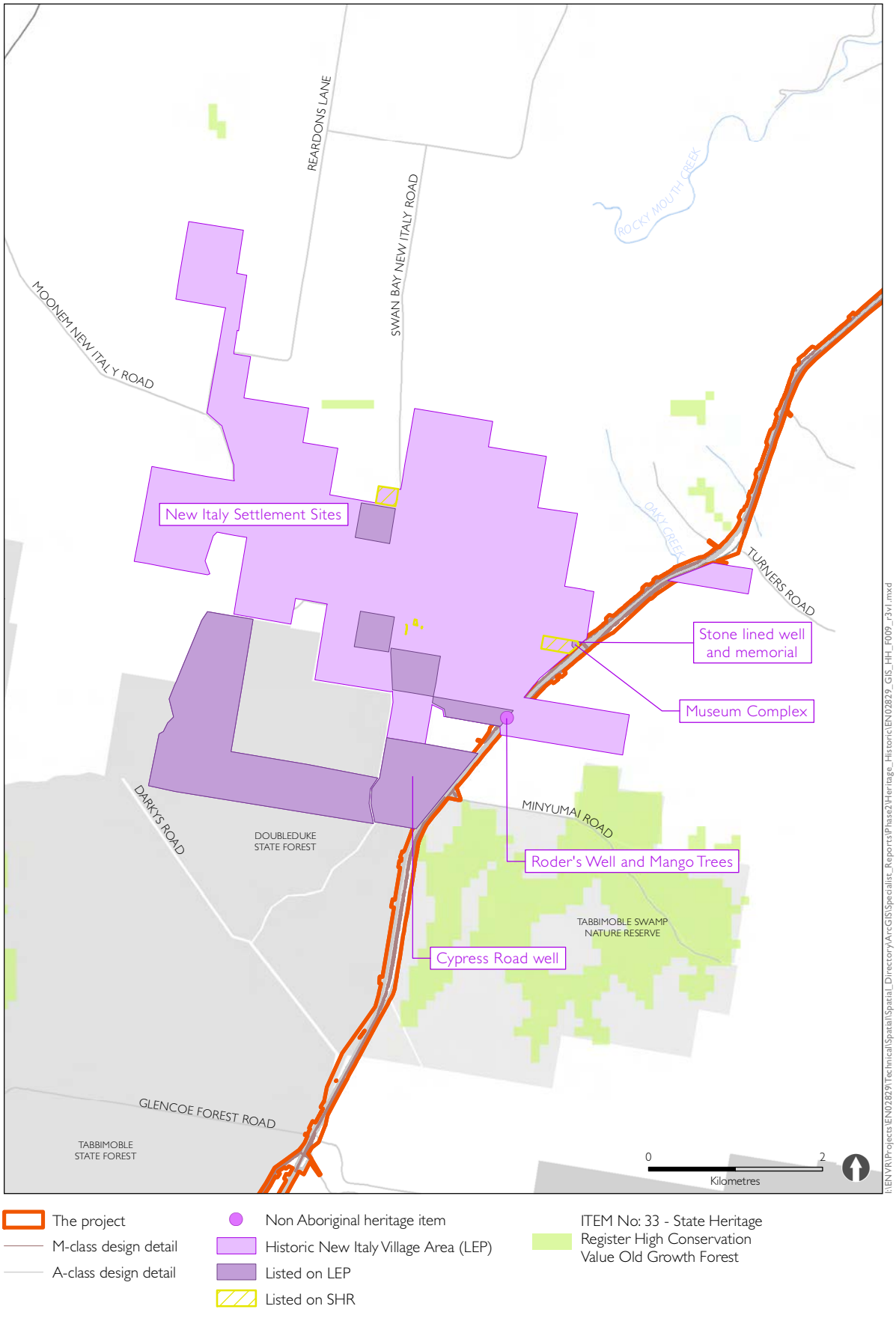
| Site ID | Site Name | Address | Lot | Significance Level | Impact |
|---|---|---|---|---|---|
| State Heritage Register 1648 | New Italy Settlement | 2 New Italy Road, New Italy via Woodburn. | Lot 2 DP616005, Part Lot 72 and Part Lot 73 DP755609 | State | Indirect impact (Lot 2)<br>No impact (Lots 72 and 73) |
| Local Environmental Plan I147 | Bazzo's Well | Forest Road, New Italy | Lot 59 DP755609 | Local | No impact |
| Local Environmental Plan I145 | Cypress Road Stone-lined Well | Cypress Road, New Italy | Lot 25 DP755610 | Local | Direct impact to lot:<br>25 DP755610<br>No impact to site |
| Local Environmental Plan I148 | New Italy Settlement (incl Museum Complex and former school site) | 2 New Italy – Swan Bay Road, New Italy | Lot 2 DP616005<br>Lot 72 DP755609 | State | Indirect impact |

[3] The broader New Italy landscape referred to in the State Heritage Register listing is equivalent to the area identified as the Historic New Italy Village Area listed in the Richmond Valley Local Environmental Plan.

| Site ID | Site Name | Address | Lot | Significance Level | Impact |
|---|---|---|---|---|---|
| Local Environmental Plan I150 | Memorial and Stone-lined Well | Cnr Swan Bay – New Italy Road and Pacific Highway, New Italy | Lot 1 DP207390 | Local | Direct impact |
| Local Environmental Plan I149 | Roder's Stone-lined Well and Orchard | Pacific Highway, New Italy | Lot 97 DP755609 | Local | Direct impact |
| Local Environmental Plan A5 | St Peter's Church, former, and Wells | 40 Forest Road, New Italy | Lot 37 DP755609 | Local | No impact |
| Local Environmental Plan A7 | Pezzuti's Wine Shop, former | Moonim-New Italy Road (corner Swan Bay – New Italy Road), New Italy | Lot 30 DP755609 | Local | No impact |
| Local Environmental Plan, section 6.4 | Historic New Italy Village Area | New Italy | Figure 7-83, Appendix A | Local | Direct impact to lots[4]:<br>16 DP755610<br>115 DP755609<br>66 DP755609<br>1 DP828347<br>3 DP616005<br>39 DP755614<br>5 DP755614<br>6 DP755614<br>6 DP262921<br>57 DP658014 |

[4] Excluding those lots already assessed as other components/sites.

Figure 5-1 Curtilage of heritage item number 23, New Italy Settlement Sites



## Proposed works

The project at New Italy includes an upgrading to class A at first, with an ultimate upgrade to class M in the future which runs through the entire New Italy area.

In the immediate vicinity of the New Italy Museum Complex the class A upgrade proposes a closure of the current southerly access point from the highway with upgrade of the current northerly access point, and a redesign of the current carpark facilities at the front of the museum complex. The class M upgrade removes immediate access from the highway to the museum complex altogether. Access to the museum complex would be via the service road running parallel to the proposed highway. Access to the service road from the highway would be from either the interchange at Woodburn located eight kilometres to the north, or the interchange at Iluka Road, around 23 kilometres to the south. The service road which forms part of the class M upgrade retains the opportunity for a similar carpark area to that in the class A upgrade.

## Impact summary

There would be no direct impacts on the State Heritage Register or Local environmental plan curtilage at the Museum Complex. Indirect impacts would likely occur from the project (both class A and class M upgrades) adjacent to but outside the State Heritage Register boundary, particularly during construction of the access upgrade and carpark facilities. These may include physical damage to the buildings and structures if road construction materials blow or spill onto the items, or if road construction machinery enters or ground surface disturbance occurs within State Heritage Register boundary, due to close proximity of the project.

The Local environmental plan listed Memorial and Stone-lined Well adjacent to the west of the Museum Complex would be subject to both indirect and direct impacts. Direct impacts on the memorial and adjacent flagpole would occur due to the project (class A upgrade) requiring the removal/demolition of the memorial and flagpole from their current location. Indirect impacts would likely occur from the project (both class A and class M upgrades) at the site, particularly during construction of the access upgrade and carpark facilities. As for the museum complex, these may include physical damage to the buildings and structures if road construction materials blow or spill onto the items, or if road construction machinery enters or ground surface disturbance occurs within State Heritage Register boundary, due to close proximity of the project. Additional indirect impact would occur from the class M upgrade through the removal of direct access from highway to museum complex, leading to a reduction in accessibility for visitors.

The Local environmental plan listed Roder's stone-lined well and orchard would be subject to direct and indirect impacts from the project. The class A upgrade would result in destruction of the stone-lined well, and possibly physical damage to the mango orchard if road construction machinery enters or ground surface disturbance occurs close to the orchard, or if road construction materials blow or spill onto the orchard. The class M upgrade would require removal of the mango orchard for construction of the service road adjacent to the highway.

For the Local environmental plan listed Cypress Road stone-lined well and the Local environmental plan listed Historic New Italy Village Area, the project boundary would cross both curtilages, however there would be no impact on any known heritage features or items within these curtilages.

This SOHI has been prepared by Karen Murphy (Archaeologist, SKM). The following assessment has been undertaken only for those listed lots where the works are proposed. Listed sites which would not be impacted by the project are not considered below.

### Impact assessment – New Italy Settlement (Museum Complex) (State Heritage Register 1648, Local Environmental Plan I148) (Figure 5-2)

*The following aspects of the proposal respect or enhance the heritage significance of the item for the following reasons:*

There would be no direct impacts within the State Heritage Register or Local environmental plan curtilage as a result of the project.

- Maintenance of direct access from the highway and the upgrade of carpark facilities (class A upgrade). This would respect and enhance the social significance of the site. The continued maintenance of the site as a museum and memorial complex would enable the social significance of the site to be respected and enhanced through the continuing celebration of the early community of immigrants by the broader regional and visitor community. The continuation of the current use of the site as a museum and memorial complex open to and easily accessible by visitors would also support the conservation of both its fabric and its other heritage values through the ongoing care and custodianship of the New Italy community.

*The following aspects of the proposal could detrimentally impact on heritage significance. The reasons are explained as well as the measures to be taken to minimise impacts:*

Indirect impacts would likely occur from the project (both class A and class M upgrades) adjacent to but outside the State Heritage Register boundary, particularly during construction of the access upgrade and carpark facilities. The following indirect impacts are considered likely:

- Physical damage to the exterior surfaces of heritage items if road construction materials blow or spill onto the items. To protect the museum complex and reduce its exposure to road construction materials, particularly dust, the mitigation measures for maintaining air quality and dust control as detailed in the proposed air quality management plan would be implemented. This plan would address spoil and stockpile handling, machinery operating procedures and monitoring of impacts. Sediment control would also be put in place in between the road and the stockyards prior to road construction works commencing and would remain in place until the conclusion of the works in the vicinity of the stockyard, at which time it would be removed
- Physical damage to exterior and structural integrity of heritage items if road construction machinery enters or ground surface disturbance occurs within State Heritage Register boundary, due to close proximity of the project. In order to protect the heritage items within the State Heritage Register boundary protective barrier fencing would be constructed in between the construction area and the heritage items prior to construction works commencing in the vicinity of the item and would remain in place until the conclusion of those road works at which time they would be removed

- While vibration caused during construction is unlikely to damage the structural integrity of the heritage items, a photographic dilapidation survey would be undertaken of the current condition and damage to the heritage items prior to construction commencing in the vicinity. In the unlikely event of damage caused during construction this would be repaired once construction is complete.

By implementing these mitigation measures the potential impacts on the heritage items within and close to the State Heritage Register boundary would be avoided.

Additional indirect impacts would occur due to the proposed class M upgrade:

- Removal of direct access from the highway to the museum complex. This would impact on the current use of the site as a museum and memorial complex through a reduction in visitor amenity and ease of accessibility for visitors in vehicles, and would impact in the operation of the project following construction. This in turn would impact on the social significance of the site in relation to the continuing celebration of the early community of immigrants by the broader regional and visitor community. Such impact on the continued use of the site as a museum and memorial complex open to and easily accessible by visitors would subsequently effect its long term management and the condition of its other heritage values. Conspicuous signage (which conforms to relevant road standards) relating to the New Italy museum complex would be installed at both the interchange at Woodburn and interchange at Iluka Road to divert visitors onto the service road in order to access the museum complex.

By implementing this mitigation measure the impact of the project on the significance of the museum complex would be minimised.

Figure 5-2 Curtilage of heritage item number 23, New Italy Settlement and Museum Complex Component

## Impact assessment – Memorial and Stone-Lined Well (Local Environmental Plan I150) (Figure 5-2)

*The following aspects of the proposal respect or enhance the heritage significance of the item for the following reasons:*

- Maintenance of direct access from the highway and the upgrade of carpark facilities (class A upgrade). This would respect and enhance the social significance of the site. The continued maintenance of the site as an associated part of the museum and memorial complex would enable the social significance of the site to be respected and enhanced through the continuing celebration of the early community of immigrants by the broader regional and visitor community. The continuation of the current use of the adjacent site as a museum and memorial complex open and easily accessible by visitors would also support the conservation of both its fabric and its other heritage values through the ongoing care and custodianship of the New Italy community.
- The stone-lined well would not be directly impacted by the project.

*The following aspects of the proposal could detrimentally impact on heritage significance. The reasons are explained as well as the measures to be taken to minimise impacts:*

- Direct impacts on the memorial and flagpole would occur due to the project (class A upgrade) requiring the removal/demolition of the memorial and flagpole from their current location. The complete demolition of the memorial would have a high level of impact on the associative and ongoing social significance of the site as a place of continuing celebration and memorialisation of the Italian immigrant community and is not considered to be an option. The associative and social significance of the site may be maintained by placing the memorial elsewhere on the site in a prominent and accessible position as close to its current position as possible. Prior to any road construction works commencing the memorial and flagpole would be:
- Subject to an archival photographic recording in accordance with the Heritage Branch of the Office of Environment and Heritage guidelines and a dilapidation survey.
- Removed from their current location and reinstated within the boundaries of Lot 1 DP207390 and outside the project boundary to the north of the stone-lined well. This work would be undertaken under the supervision of an appropriately qualified monumental stonemason and a qualified heritage professional.

By implementing these mitigation measures the significance of the heritage item would be maintained.

Indirect impacts would likely occur from the project (both class A and class M upgrades) at the site, particularly during construction of the access upgrade and carpark facilities. The following indirect impacts are considered likely:

- Physical damage to the exterior surfaces of the stone-lined well, memorial and flagpole and the interior of the stone-lined well if road construction materials blow or spill onto/into the heritage items. To protect the memorial and stone lined well and reduce their exposure to road construction materials, particularly dust, the mitigation measures for maintaining air quality and dust control as detailed in the proposed air quality management plan would be implemented. This plan would address spoil and stockpile handling, machinery operating procedures and monitoring of impacts. Sediment control would also be put in place in between the road and the stockyards prior to road construction works commencing and would remain in place until the conclusion of the works in the vicinity of the stockyard, at which time it would be removed
- Physical damage to exterior and structural integrity of heritage items if road construction machinery enters or ground surface disturbance occurs close to the heritage items, due to close proximity of the project. In order to protect the heritage items protective barrier fencing would be constructed in between the construction area and the heritage items, leaving a buffer of at least five metres around the heritage items, prior to road construction works commencing in the vicinity of the items and would remain in place until the conclusion of the road works at which time it would be removed
- While vibration caused during construction is unlikely to damage the structural integrity of the heritage items, a photographic dilapidation survey would be undertaken of the current condition and damage to the stone-lined well and the relocated memorial and flagpole prior to construction commencing in the vicinity. In the unlikely event of damage caused during construction this would be repaired once construction is complete
- There is unlikely to be subsurface archaeological deposits and therefore no further archaeological investigations are proposed.

By implementing these mitigation measures these potential impacts on the stone-lined well, memorial and flagpole would be avoided.

Additional indirect impacts would occur due to the proposed class M road design upgrade:

- Removal of direct access from highway to museum complex. This would impact on the current use of the site as a museum and memorial complex through a reduction in visitor amenity and ease of accessibility for visitors in vehicles, and would impact in the operation of the project following construction. This in turn would impact on the social significance of the site in relation to the continuing celebration of the early community of immigrants by the broader regional and

visitor community. Such impact on the continued use of the site as a museum and memorial complex open to and easily accessible by visitors would subsequently effect its long term management and the condition of its other heritage values. Conspicuous signage relating to the New Italy museum complex would be installed at both the interchange at Woodburn and interchange at Iluka Road to divert visitors onto the service road in order to access the museum complex.

By implementing this mitigation measure the impact of the project on the significance of the heritage item would be minimised.

### Impact assessment – Cypress Road Stone-lined Well (Local Environmental Plan I145)

*The following aspects of the proposal respect or enhance the heritage significance of the item for the following reasons:*

The project boundary, while crossing within the boundary of Lot 25 DP755610, is around 300 metres from the Cypress Road Stone-Lined Well and as such the project would not impact on the well itself, thereby maintaining its heritage significance.

*The following aspects of the proposal could detrimentally impact on heritage significance. The reasons are explained as well as the measures to be taken to minimise impacts:*

The project would physically impact on the lot on which the stone-lined well is situated, however there would be no impact on the well. The impact area was subject to pedestrian survey with no historical heritage features identified. While the presence of historical heritage features may still occur in the impact zone, the likelihood of such archaeological remains is assessed as being low and therefore no further archaeological investigations are proposed.

### Impact assessment – Roder's Stone-lined Well and Orchard (Local Environmental Plan I149) (Figure 5-3)

*The following aspects of the proposal respect or enhance the heritage significance of the item for the following reasons:*

- While the project (both class A and class M upgrades) would have a direct impact on the physical remains of the stone-lined well and the mango orchard, the opportunity for undertaking a detailed salvage archaeological investigation of the site prior to its destruction may enhance its significance through the realisation of its research potential. Undertaking archaeological investigation of the site under a well-structured research design by an appropriately qualified historical archaeologist would reveal information and answer questions particularly in relation to the cultural, building and horticultural practices brought from Italy and adapted to Australian environmental conditions. The archaeological investigation

may particularly reveal information about well-construction techniques, the adaptation to the lack of a permanent above-ground water source for the settlement, and assist in the conservation of other examples of stone-lined wells elsewhere in New Italy.

*The following aspects of the proposal could detrimentally impact on heritage significance. The reasons are explained as well as the measures to be taken to minimise impacts:*

The class A upgrade would have an impact on the stone-lined well and the class M upgrade would have a direct impact on the mango trees. Both the class A and class M upgrades would have the following detrimental impacts on the site's heritage significance through the physical destruction of the stone-lined well and mango orchard:

- Historical significance. The project would impact on the site's historical significance by destroying one of the key examples of physical evidence of an early and possibly the first Italian settlement in NSW
- Aesthetic significance. The project would impact on the site's aesthetic significance by destroying physical evidence of water management activities, building and plantings which are evocative in the landscape of the former settlement and its isolation, and the sense of the scrub blocks from which the pioneers carved an existence. Given the low level of obtrusiveness of the physical remains of the New Italy Settlement the destruction of any of these elements would have a high detrimental impact on the overall aesthetic values of the site
- Rarity. The project would have an impact on rare physical evidence of the only known Italian settlement of its type in NSW. There are only three other existing stone-lined wells known within the New Italy Settlement area. This is a low number considering the number of houses historically known to have existed within the settlement. As such, the destruction would have a high detrimental impact on the rarity value of the overall site and the individual example of the well. The combination of the well, associated structural remains and plantings as a complex are also rare within the New Italy Settlement Landscape
- Intactness/integrity. The current high level of archaeological integrity and intactness of the well and associated structural remains would be detrimentally impacted by the project
- Research Potential. While the project provide an opportunity for the archaeological investigation of the well and structural remains, the destruction of the site through either the project or through undertaking archaeological excavation, reduces the future research potential of this area of the site to nothing.

The opportunity for the realisation of the site's research potential does not outweigh the other detrimental impacts on the historical and aesthetic significance, the site's rarity or its archaeological intactness and integrity. Realignment of the project further east was considered, however, would impact on an Aboriginal heritage item and would result in large native vegetation disturbance. The project alignment maximises the use of the existing project boundary to minimise these impacts.

The following impacts are considered for the class A upgrade:

- Destruction of the stone-lined well. Impacts would be mitigated to some extent through the opportunity to undertake archaeological investigation of the site. Archaeological investigations at the site would be undertaken as follows:
- Salvage excavation to be undertaken in an area including the well and the adjacent wall
- Salvage excavation to be undertaken in accordance with the Heritage Branch of the Office of Environment and Heritage guidelines including an appropriate research design and methodology in order to best realise the research potential of this area of the site
- Salvage excavation undertaken under the supervision of an appropriately qualified and experienced historical archaeologist in accordance with the Heritage Branch of the Office of Environment and Heritage criteria
- Physical damage to the physical integrity and health of the mango orchard if road construction machinery enters or ground surface disturbance occurs close to the heritage items, due to close proximity of the project. In order to protect the mango orchard protective barrier fencing would be constructed in between the construction area and the heritage items, leaving a buffer of at least five metres around the heritage items, prior to road construction works commencing in the vicinity of the items and would remain in place until the conclusion of those road works at which time it would be removed
- Physical damage to the mango orchard if road construction materials blow or spill onto/into the heritage items. To protect the orchard and reduce its exposure to road construction materials, particularly dust, the mitigation measures for maintaining air quality and dust control as detailed in the proposed air quality management plan would be implemented. This plan would address spoil and stockpile handling, machinery operating procedures and monitoring of impacts. Sediment control would also be put in place in between the road and the stockyards prior to road construction works commencing and would remain in place until the conclusion of the works in the vicinity of the stockyard, at which time it would be removed
- While vibration caused during construction is unlikely to damage the mango orchard, the location and condition of each of the trees in the orchard would be recorded by an arborist.

By implementing these mitigation measures the potential impacts on the mango orchard would be avoided. Implementing the mitigation measure for the stone-lined well would realise the research potential of the heritage item (criterion E) and contribute information towards understanding its overall heritage significance.

The following impacts are considered likely for the class M upgrade:

- Demolition of the mango orchard through the construction of service road adjacent to highway. An archival photographic recording would be made of the mango orchard and its surrounds in accordance with the Heritage Branch of the Office of Environment and Heritage guidelines prior to its demolition.

Implementing the mitigation measure would reduce the impact on the significance of the orchard as much as is possible given the other constraints in this area of the project.

## Impact assessment – Historic New Italy Village Area (Local Environmental Plan Section 6.4)

The following assessment excludes those areas within the boundary of the Historic New Italy Village Area (Local Environmental Plan Section 6.4) already assessed above.

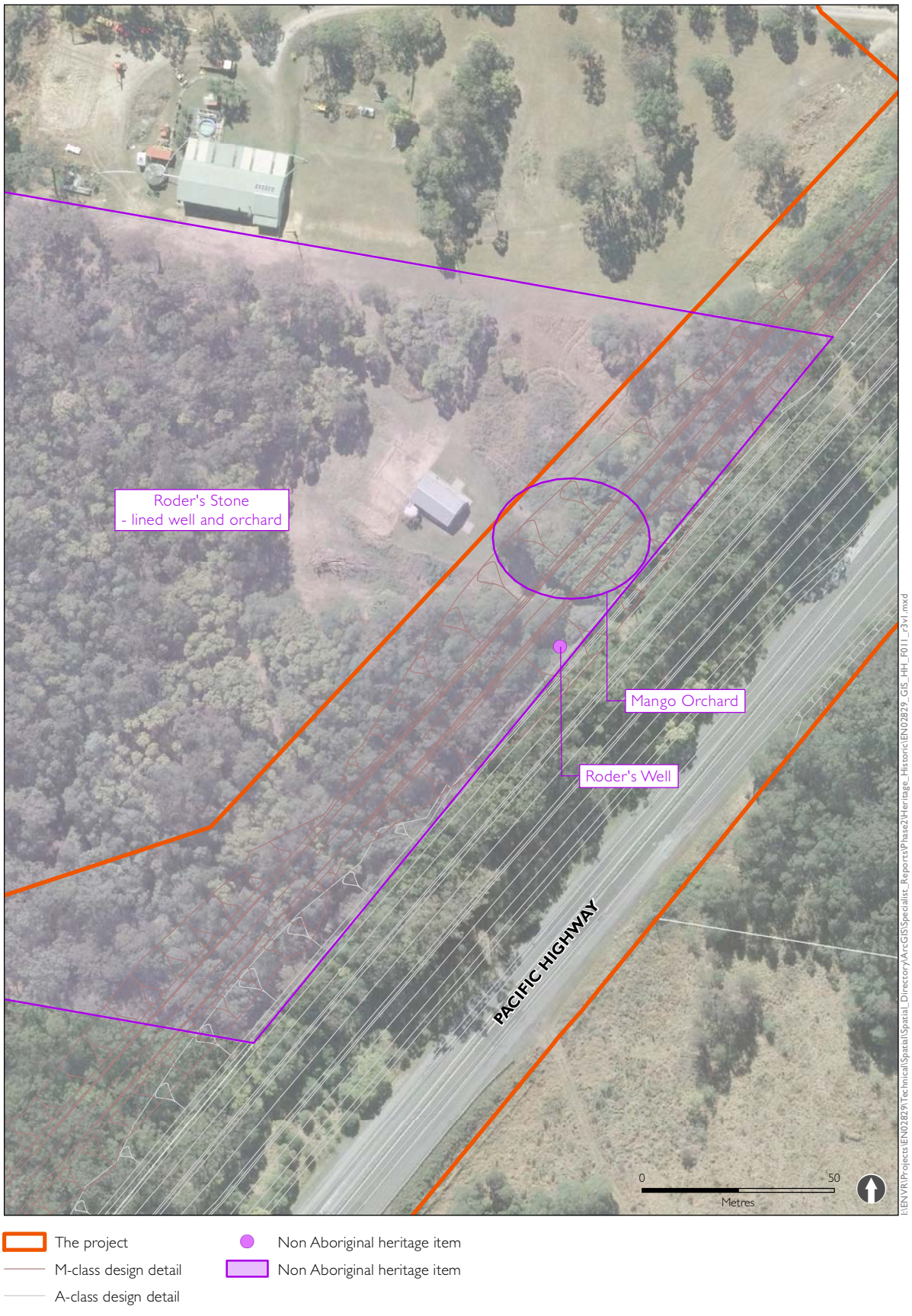
*The following aspects of the proposal respect or enhance the heritage significance of the item for the following reasons:*

The project boundary, while crossing several lots within the boundary of the Historic New Italy Village Area, minimises impacts on the heritage significance of the site by avoiding any known historical heritage features or sites.

*The following aspects of the proposal could detrimentally impact on heritage significance. The reasons are explained as well as the measures to be taken to minimise impacts:*

The project would have a physical impact on lots within the Historic New Italy Village Area, however there are no known physical remains related to the New Italy Settlement in the impact area. While the presence of previously unknown historical heritage features may still occur in the impact zone, the likelihood of such archaeological remains is assessed as being low. If any historical heritage remains are discovered during construction the management measures detailed in section 6.1.1 – Discovery of historical heritage materials, features or deposits, must be applied.

Figure 5-3 Curtilage of heritage item number 23, Roder's Well and Mango Orchard Component



### 5.4.9. Item 26: Maloney Property, Broadwater

#### Site details

Item 26 is located off Evans Head-Broadwater Road, Broadwater on Lots 5 and 10 DP1142669, in Section 9. The buttery/creamery and dairy were identified during a field survey of project boundary in August 2010. The additional components of the associated homestead and stockyards were identified during a site visit in October 2011. The site is of local heritage significances as it meets **criterion A** (important in the pattern of NSW's history), **criterion B** (strong or special associations), **criterion E** (potential to yield information), **criterion F** (uncommon or rare) and **criterion G** (principal characteristics of a class). The site is not currently listed on any heritage register or list. See Appendix A.26 for full site description, photographs and significance assessment.

#### Proposed works

The project includes construction of a dual carriageway through the Maloney Property which is located around 750 metres east of the existing Pacific Highway.

This SOHI has been prepared by Rachael Loizou (Archaeologist, SKM).

#### Impact assessment

*The following aspects of the proposal respect or enhance the heritage significance of the item for the following reasons:*

The project would not have a direct impact on the homestead or the stockyards items.

*The following aspects of the proposal could detrimentally impact on heritage significance. The reasons are explained as well as the measures to be taken to minimise impacts:*

The project would have a direct impact on the curtilage of the heritage item and would require the complete demolition of the dairy and buttery/creamery. The importance of the site in the pattern of NSW's history, the representativeness of the buttery/creamery of its class, the rarity of the site, the potential for the site to yield information and the association of the site with Patrick Sheehy and the Maloney family would all be detrimentally impacted as a result of the proposed demolition of the dairy and buttery/creamery. To manage the impacts to the Maloney property, an archival photographic recording would be made of the buttery/creamery, the dairy and its surrounds in accordance with the Heritage Branch of the Office of Environment and Heritage guidelines prior to demolition.

- The homestead has been identified for architectural noise treatment to control noise levels from the highway. Architectural treatment could include a range of noise controls. These noise controls are generally considered to be the most cost-effective solution for isolated residents where noise barriers and/or low-noise pavements are not feasible. Examples generally include sealing off wall vents,

upgrading windows, glazing and solid core doors within the noise exposed façade(s). Also, providing air conditioning or ventilation systems to meet the Building Code of Australia requirements for fresh air is a further example of a control measure that could be used at an affected property. For these measures to be effective, the property must be in a reasonable state of repair. The noise controls would be developed in consultation with a qualified heritage consultant to minimise impacts on the heritage significance of the item. A more detailed SOHI would be prepared when the specific architectural noise treatments for the homestead are identified.

- There are no known or suspected archaeological deposits within the project boundary therefore no further archaeological investigations are proposed.

Implementing the mitigation measure would reduce the impact on the significance of the Maloney property by recording as much relevant information as possible about the buttery/creamery and dairy buildings before their demolition.

## Item 27: Meerschaum Vale Brickworks, Wardell

### Site details

The location of the Item 27 has not been able to be confirmed from physical evidence due to high levels of vegetation at the site, however is believed to be situated on Lot 7 DP866508 near the intersection of Wardell Road and Thurgates Lane, Wardell, in Section 10. The Meerschaum Vale Brickworks site was identified as being of local significance by Gahan (2004) in the Wardell Community Based Heritage Study and further discussed by Heritage Concepts (2005). Primary source research of local newspapers and historical maps has also failed to confirm the location of the Brickworks. The site has been assessed as being of local heritage significance for its historical and archaeological values meeting **criterion A** (important in the pattern of NSW's history), and **criterion E** (potential to yield information). The site is not currently listed on any national, state or local heritage register or list. See Appendix A.27 for full site description, photographs and significance assessment.

### Proposed works

The project includes the alignment of the class M upgrade of the highway, running north-south through the lot identified as potentially containing remains of the Meerschaum Vale Brickworks on the north side and south side of Wardell Road, to the west of the intersection of Thurgates Lane. The project also includes an overpass within the identified lot.

This SOHI has been prepared by Karen Murphy (Archaeologist, SKM).

### Impact assessment

*The following aspects of the proposal respect or enhance the heritage significance of the item for the following reasons:*

No physical evidence of the site was located during survey due to the lack of ground surface visibility, the large potential area where the remains may be located and the lack of any previous physical evidence being sighted. Given this, test excavations would require an enormous effort for very little likely return, and are therefore not recommended. The project may identify the location of the site through ground disturbance activities. This would enable the archaeological potential of the site to be realised through the investigation and recording of the site. However given the sparse nature of the historical evidence and the complete lack of physical evidence identified to date, the likelihood of this is extremely low.

*The following aspects of the proposal could detrimentally impact on heritage significance. The reasons are explained as well as the measures to be taken to minimise impacts:*

Given that the remains of the Brickworks are likely to be unobtrusive and possibly below the ground surface (such as remnant brick and brick waste, footings of kilns or other buildings) the ground disturbance activities of the project may damage or destroy the remains of the site. If brick material or any other historical heritage remains are discovered during construction the management

measures detailed in section 6.1.1 – Discovery of historical heritage materials, features or deposits, would be applied.

### 5.4.10. Item 28: Byrne Property, Broadwater

#### Site details

Item 28 is situated on the Pacific Highway, Broadwater, on Lot 6 DP1043232 in Section 9. The site comprises the vegetated area in the south-east corner of the lot and comprises a number of features related to the operation of the property as a sugar cane farm from the 19th century to the present day. The site includes a well, clay pits used in brick-making, stone quarry, pig-sties, stockyard/pen, metal items including trailers and water tanks, and domestic artefacts including the remains of ceramic tableware and glass bottles. The site was identified by Heritage Concepts (2005) and is of local heritage significance. The site meets significance **criterion A** (important in pattern of NSW's history), **criterion B** (strong or special associations), and **criterion E** (potential to yield information). The site is not currently listed on any state or local heritage register or list. See Appendix A.28 for full site description, photographs and significance assessment.

#### Proposed works

The project includes the construction of a dual carriageway, running in a north-south direction through the heritage curtilage identified. Geotechnical investigations including possible blasting are proposed to be undertaken on the Byrne property.

This SOHI has been prepared by Karen Murphy (Archaeologist, SKM).

#### Impact assessment

*The following aspects of the proposal respect or enhance the heritage significance of the item for the following reasons:*

- While the project would have a direct impact on some of the physical remains of the site, the opportunity for undertaking a detailed salvage archaeological investigation in the proposed impact areas of the site prior to their destruction may mitigate impact to the site's significance through the realisation of some of its research potential. Undertaking archaeological investigation of the site under a well-structured research design by an appropriately qualified historical archaeologist would reveal information and answer questions particularly in relation to the little-documented, everyday lives of workers associated with the sugar industry, a key industry for the entire region. There is also the potential to yield information about the variety of activities undertaken in supporting the operation of an early sugar cane farm including the attitude towards self-sufficiency particularly highlighted by the presence of brick-making and stone quarrying on the site
- While situated within the project boundary the project would avoid direct impacts on the brick-lined well

- The project would not have an impact on the large clay pit, the pig-sties, stockyard or the high concentration of domestic artefacts noted in the south-east corner of the site
- The large moveable items currently situated in the stone quarry have the potential to be directly impacted by the project, but would be moved elsewhere on the site prior to construction.

*The following aspects of the proposal could detrimentally impact on heritage significance. The reasons are explained as well as the measures to be taken to minimise impacts:*

The project would have physical impacts on a number of features at the site. The road design would have a direct impact on the stone quarry, one of the clay pits and domestic artefacts or features potentially situated beneath the ground surface. The project would also potentially impact the well as it is situated within the project boundary and is in close proximity to proposed geotechnical investigations. These physical effects would have the following detrimental impacts on the site's heritage significance through their physical destruction:

- Historical significance. The proposed work would impact on the site's historical significance by destroying the small clay pit, the stone quarry and a section of the area where cane cutters resided on the property
- Associative significance. There would be only minor impact on the site's associative significance as a large proportion of the site would be retained in the ownership of the Byrne family
- Research potential. While the project would destroy a section of the site with high potential to contain sub-surface archaeological remains related to the domestic occupation of the site by cane cutters and farm workers, some of the research potential may be realised due to the opportunity to undertake detailed archaeological salvage excavation of part of the site.

To minimise the impacts and maximise the opportunity for realising research potential at the site, the following actions would be undertaken:

- Retention of the brick-lined well in situ and protection from all impacts
- Archival photographic recording of the stone quarry in accordance with the Heritage Branch of the Office of Environment and Heritage guidelines
- Archaeological salvage excavation of the impact area of the site situated to the south of the quarry
- Salvage excavation to be undertaken in accordance with the Heritage Branch of the Office of Environment and Heritage guidelines including an appropriate research design and methodology in order to best realise the research potential of this area of the site

- Salvage excavation undertaken under the supervision of an appropriately qualified and experienced historical archaeologist in accordance with the Heritage Branch of the Office of Environment and Heritage criteria.

Implementing the mitigation measures for the heritage item would realise the research potential of the heritage item (criterion E) and contribute information towards understanding its overall heritage significance.

The brick-lined well is situated within the project boundary and in close proximity to proposed geotechnical investigations including possible blasting activities. Should geotechnical investigations determine that blasting is required at this location, the following would be undertaken:

- A detailed assessment of the level of vibration at the brick-lined well based on factors including distance from the blast site and the quantity of the explosive, and modelling of the predicted vibration levels at the brick-lined well
- A photographic dilapidation survey and structural audit of the current condition and damage to the brick-lined well.

Dependant on the outcome of the detailed vibration assessment and the dilapidation survey and structural audit the following mitigations measures would be considered to mitigate impacts on the brick-lined well:

- Construction of temporary or permanent supports or shoring within the brick-lined well
- Stabilisation of the brick-lined well
- Installation of vibration monitoring devices.

At the completion of any geotechnical blasting activities a further dilapidation survey / structural audit and condition report would be prepared and any resultant damage restored.

Subsequent construction works of the proposed design would not directly impact the brick-lined well. As the proposed construction work is within 30 metres of the well the following indirect impacts are considered likely:

- Vibration generated during construction may damage the structural integrity of the brick-lined well due to close proximity and the sandy nature of the surrounding sediments. If not already undertaken as part of prior geotechnical investigations, a photographic dilapidation survey would be undertaken of the current condition and damage to the brick-lined well prior to construction commencing in the vicinity. Prior to any road construction works commencing in the vicinity of the heritage item any loose or unstable components of the well would be secured and would remain secured until the conclusion of the work. Any methods used to secure components would be reversible and not cause damage to the brick-lined well

- Physical damage to the interior surfaces of the well if road construction materials blow or spill into the well. To protect the heritage items and reduce their exposure to road construction materials, particularly dust, the mitigation measures for maintaining air quality and dust control as detailed in the proposed air quality management plan would be implemented. This plan would address spoil and stockpile handling, machinery operating procedures and monitoring of impacts. Sediment control would also be put in place in between the road and the stockyards prior to road construction works commencing and would remain in place until the conclusion of the works in the vicinity of the stockyard, at which time it would be removed
- Physical damage to the structural integrity of the well if road construction machinery enters or ground surface disturbance occurs within 15 metres of the well. In order to protect the well protective barrier fencing would be constructed around the entire well creating a 15 metre buffer zone prior to construction work commencing in the vicinity of the heritage item and would remain in place until the conclusion of the work at which time they would be removed.

By implementing these mitigation measures the potential impacts on the brick-lined well would be avoided.

Following construction, the well would be situated within the road reserve. Permanent prevention of access to the well in order to maintain public safety and protect the well following completion of construction would be put in place. This may include a permanent fence or a covering of the well. Any measures to close the well would ensure the well could be accessed in the future for heritage research or other purposes and would ensure no physical impact on the well.

### 5.4.11. Item 29: 'Stonehenge' Property, Wardell

#### Site details

Item 29 is situated on Lumley's Lane, Wardell, on Lot 2 DP543525 in Section 10. The site comprises the main residence (partly comprising the original late 1880s residence), late 19th and early 20th century dairy buildings and yards, a 1940s residence, and a system of early 20th century drainage canals. The site also includes a range of movable heritage items relating to the operation of the property as a farm. The site was identified by Gahan (2004) and investigated by Heritage Concepts (2005). The site is of local heritage significance meeting significance **criterion E** (potential to yield information). The site is not currently listed on any state or local heritage register or list. See Appendix A.29 for full site description, photographs and significance assessment.

#### Proposed works

The project includes the class M upgrade of the highway, running in a west-east direction through the heritage curtilage identified. The work also includes an access road parallel to the north of proposed highway providing access to the property from Wardell Road and access to other local roads. An overpass over the project boundary linking the access road to other local roads would also be constructed. These works would require complete demolition of the main residence and would also destroy a large section of the drainage canal on the property.

This SOHI has been prepared by Karen Murphy (Archaeologist, SKM).

#### Impact assessment

*The following aspects of the proposal respect or enhance the heritage significance of the item for the following reasons:*

The proposed design minimises impacts on the overall heritage item with direct impact being limited to one of the structures (the main residence which has been greatly modified) and a small part of the large network of drainage channels in the area. Impact on the original dairy buildings, 1940s residence and movable heritage items would be avoided.

*The following aspects of the proposal could detrimentally impact on heritage significance. The reasons are explained as well as the measures to be taken to minimise impacts:*

The proposed work would require complete demolition of the main residence and would also destroy a large section of the drainage canal on the property. The significance of the property overall is related to farming operations which are more directly related to the structures (dairy buildings, yards) and the movable heritage items (farming equipment etc) on the property which would not be impacted. Given the extent of modifications made to the original portion of the 1880s residence and its incorporation into a much larger main residence, the potential of the property to yield information about farming practices would be maintained to a large extent. The overall detrimental impact on the 'Stonehenge' property though the demolition of the residence is low. The existence of a large network of early 20th century drainage channels in the area outside the

'Stonehenge' property also reduces the overall detrimental impact on the significance of the drainage channels as a heritage item. To manage the impacts on the 'Stonehenge' property, an archival photographic recording would be made of the main residence and the drainage system and its surrounds in accordance with the Heritage Branch of the Office of Environment and Heritage guidelines prior to its demolition. A detailed recording of the location of the drainage system within the 'Stonehenge' property would also be undertaken.

- The 1940s residence has been identified for architectural noise treatment to control noise levels from the highway. Architectural treatment could include a range of noise controls. These noise controls are generally considered to be the most cost-effective solution for isolated residents where noise barriers and/or low-noise pavements are not feasible. Examples generally include sealing off wall vents, upgrading windows, glazing and solid core doors within the noise exposed façade(s). Also, providing air conditioning or ventilation systems to meet the Building Code of Australia requirements for fresh air is a further example of a control measure that could be used at an affected property. For these measures to be effective, the property must be in a reasonable state of repair. The noise controls would be developed in consultation with a qualified heritage consultant to minimise impacts on the heritage significance of the item. A more detailed SOHI would be prepared when the specific architectural noise treatments for the residence are identified.
- No archaeological deposits have been identified at the site and therefore no further archaeological investigations are proposed.

Implementing the mitigation measures would reduce the impact on the significance of the heritage item by recording as much relevant information as possible about the main residence before its demolition.

### 5.4.12. Item 32: Harwood Heritage Conservation Area, Harwood

#### Site details

Item 32 (Harwood Heritage Conservation Area) comprises a large proportion of the town of Harwood (Figure 7-142) in Section 5. The Area is listed for its local heritage significance in the draft Clarence Valley Local Environmental Plan (2010). A significance assessment undertaken for this report recognises the Area for **criterion A** (important in the pattern of NSW's history) and **criterion E** (potential to yield information). See Appendix A.32 for full site description, photographs and significance assessment.

#### Proposed works

The project includes the duplication of the crossing of the Clarence River to the east of the existing Harwood Bridge. The proposal would require the demolition of Item 21 (Convent, 12 River Street). Construction traffic would travel within the Conservation Area in particular over the section of road containing remains of the Harwood Tramway Tracks (Item 17) known as the Petticoat Lane Tramway Tracks. Ancillary site 3a (Section 5) would also be situated in this location.

This SOHI has been prepared by Karen Murphy (Archaeologist, SKM).

#### Impact assessment

*The following aspects of the proposal respect or enhance the heritage significance of the item for the following reasons:*

The impact of the proposal would be minimised through its location which directly impacts only one building (Item 21) within the Conservation Area. Item 21 has been assessed as having local level significance but is not listed on any register in its own right, although it forms part of the Conservation Area. The overall impact on the Heritage Conservation Area is therefore minimised.

*The following aspects of the proposal could detrimentally impact on heritage significance. The reasons are explained as well as the measures to be taken to minimise impacts:*

The project would have a direct impact on the Convent building on 12 River Street (Item 21, refer to section 5.4.7) requiring its completion demolition. There is also the potential for construction traffic to directly impact the Petticoat Lane Tramway Tracks (Item 17, refer to section 5.4.5). There would be indirect impacts on the Harwood Bridge (Item 20, refer to section 5.4.6).

Discussions with community members indicate that the relocation of the Convent (Item 21) would be highly regarded by the community. To maintain the Convent's local heritage significance the building would be relocated to an appropriate site elsewhere within the boundaries of the Harwood Heritage Conservation Area in consultation with the community. NSW Roads and Maritime Services have acquired land in Harwood which may be suitable for relocation of the Convent building. The relocation would be undertaken by an appropriately qualified house removal contractor in consultation with an appropriately qualified heritage consultant. Archival photographic

recording would be made of the heritage item and its surrounds in accordance with the Heritage Branch of the OEH guidelines prior to its relocation.

The cumulative impact of the proposal on the Heritage Conservation Area is minor. The indirect visual impact on the Harwood Bridge through the construction of the new bridge is negligible. This is due to the section of the bridge within the Heritage Conservation Area comprising only the bridge approach and abutments which are of little aesthetic significance. The direct impact on the Petticoat Lane Tramway Tracks would be mitigated through physical protection of the tracks during construction. The relocation of the Convent elsewhere within the Heritage Conservation Area, as an alternative to demolition, minimises impact on the Conservation Area. The impact on the heritage significance of the Heritage Conservation Area is also minimised by positioning the new bridge close to the existing Harwood Bridge. The intrusion is minimised being adjacent to the existing bridge and highway, rather than traversing the Heritage Conservation Area in a completely different location.

There has been no potential subsurface archaeological deposits identified and therefore no further archaeological investigations are proposed.

### 5.4.13. Item 33: High Conservation Value Old Growth Forest

#### Site details

Item 33 occurs in multiple locations across the Upper North East Region of NSW (Figure 5-4). The High Conservation Value Old Growth Forest is of state heritage significance and is listed on the State Heritage Register for its historical significance (**criterion A**), aesthetic significance (**criterion C**), research potential (**criterion E**) and rarity (**criterion F**). See Appendix A.33 for full site description and significance assessment.

#### Proposed works

The specific project works vary in each of the separate areas of Forest but include the construction of a class A and class M upgrades to the highway. See Figure 5-5 to Figure 5-12 for maps of each of the areas of the project within the heritage boundaries[5].

This SOHI has been prepared by Karen Murphy (Archaeologist, SKM).

#### Impact assessment

*The following aspects of the proposal respect or enhance the heritage significance of the item for the following reasons:*

- The project boundary aims to minimise the area of Forest that would be adversely impacted. In the majority of cases where the alignment is situated within the Forest heritage boundary, it skirts close to the edges of each boundary to minimise impact.
- No sites demonstrating evidence of Aboriginal occupation were identified within the impacted areas of Forest during the Aboriginal heritage assessment for this project.

[5] The low resolution of the official heritage boundary data supplied by NSW Heritage Branch causes 'pixelation' of the boundary of the High Conservation Value Old Growth Forest at a close level of detail in mapping and therefore a lack of clarity of the exact location of the heritage boundary in association with the project boundary.

*The following aspects of the proposal could detrimentally impact on heritage significance. The reasons are explained as well as the measures to be taken to minimise impacts:*

- The project works occurring within the heritage boundary would have a detrimental impact on the physical fabric of the Forest as trees comprising the listing would be destroyed and removed. The area of Forest potentially impacted by the proposal would be limited to 2.14 hectares; 0.001 per cent of the total 172,257 hectares of listed area. It should be noted that this amount includes areas mapped as Forest that are situated over the existing highway or have been subsequently cleared. The complete avoidance of all areas within the heritage boundary for the Forest would not be possible due to other environmental constraints and the need to meet specific road design standards and safety requirements. However, during detailed design, further consideration would be given to minimising the area of Forest to be cleared, with on-site identification (through flagging tape or similar) the extent of clearing. Forest adjacent to these areas to be cleared would be fenced to avoid accidental disturbance on further areas.
- Indirect impacts (such as increased exposure to light and vibration) would not impact on the heritage significance of the Forest. Areas affected by the project are situated adjacent to the existing Pacific Highway and are therefore mostly already subject to these forms of indirect impacts.
- The Forest heritage listing, however, does not form all mapped Old Growth Forest in the area. Surveys undertaken as part of the Regional Forest Agreements process in the Upper North East region of NSW during the late 1990s and early 2000s identified a total of 655,000 hectares of Old Growth Forest in the region, Over 50 per cent of that is located in conservation reserves (Bureau of Rural Sciences 2004). The project would also impact on other areas of Old Growth Forest that is not heritage listed. Again, in the majority of locations, these Old Growth Forest are either adjacent to the existing highway or the project would only impact on an edge of the mapped forest. It should be noted that the project would not impact on any Old Growth Forest that is located within any conservation reserve.
- The destruction of trees in these locations would have little impact on the historical significance of the Forest due to the small area of clearing required. The remaining listed area would still demonstrate the history of the use and exploitation of the Forest. No key sites demonstrating evidence of Aboriginal occupation were identified within the impacted areas as part of the Aboriginal heritage assessment for this project.
- The impact on the aesthetic value of the Forest would be minimised by aligning the project boundary as close as possible to the edges of the heritage boundaries and/or adjacent to the existing highway.
- The impact on the research potential of the Forest would be minimised due to the small proportion of the total area of the Forest being physically impacted by the

project. Additionally the areas of Forest being impacted are the most marginal, occurring alongside the heritage boundaries and/or being adjacent to the existing highway. The remaining Forest would still provide the potential to yield information about the life cycle of eucalypt forests.

- The impact on the rarity of the forest type in the Forest would be minimised due to the small proportion of the total area of the Forest that would be cleared for the project. Additionally the areas of Forest being impacted are the most marginal, occurring alongside the heritage boundaries and/or being adjacent to the existing highway. The remaining Forest would still provide for the protection of a rare forest type and valuable habitat. The impacts on the habitat of native animal species including those of rare or endangered status has been considered in the Ecological Assessment for this project.
- As there is little or no impact on the heritage significance of the Forest as part of the project no further mitigation measures would be required.

Figure 5-4 Curtilage of heritage item number 33, High Conservation Value Old Growth Forest

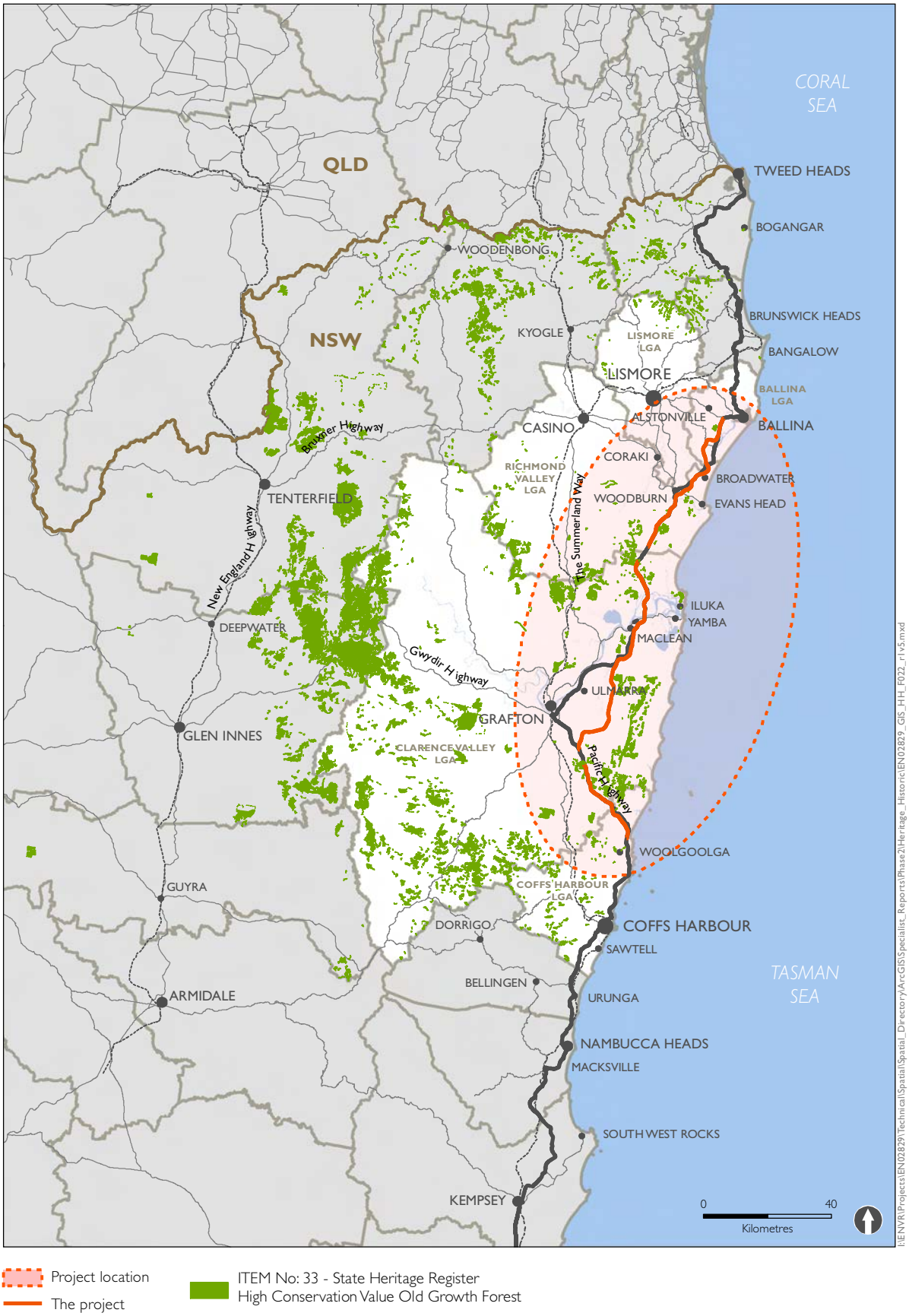
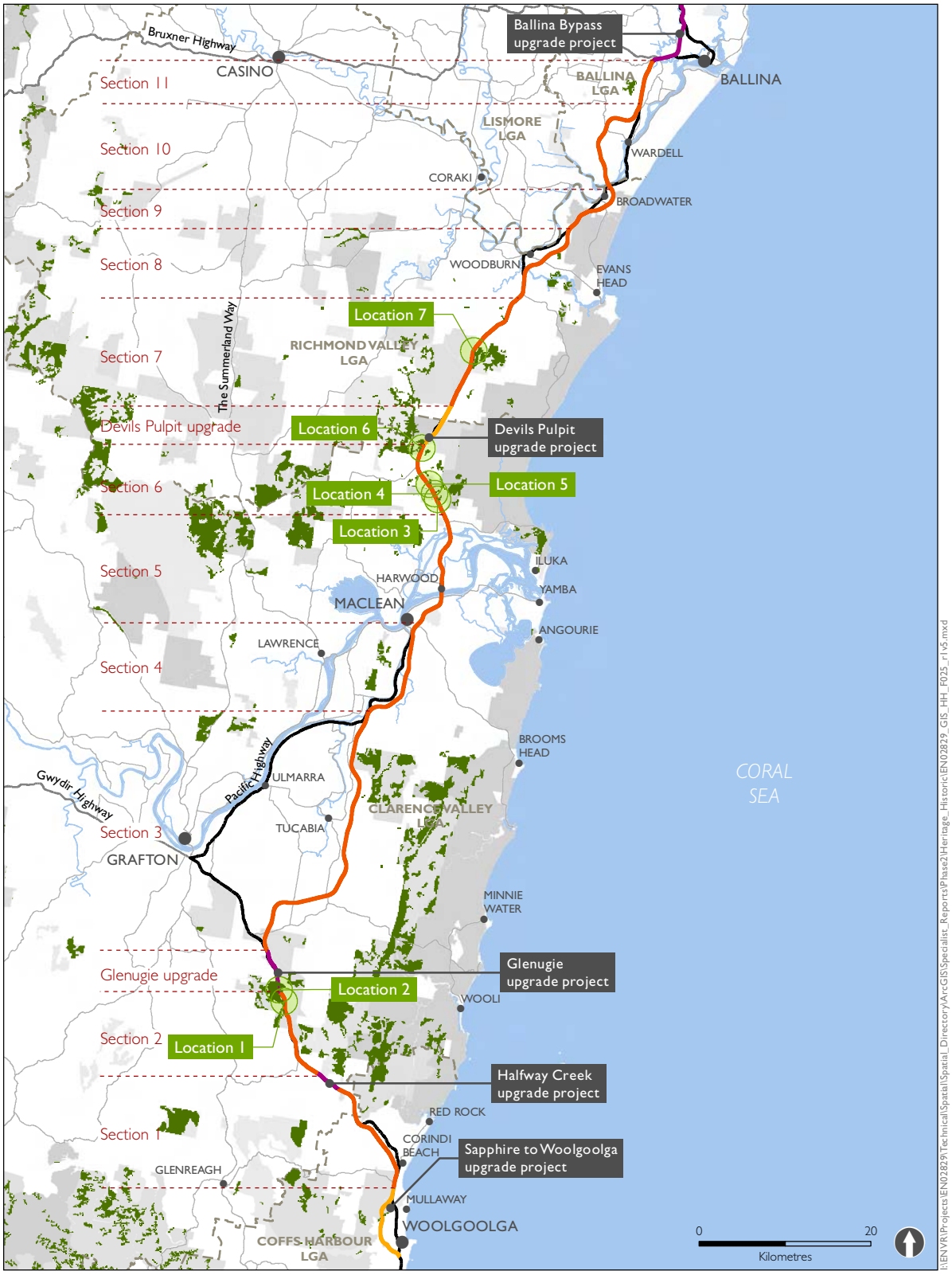


Figure 5-5 Heritage item number 33, High Conservation Value Old Growth Forest - overview of impact locations




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

ITEM No: 33 - State Heritage Register
High Conservation Value Old Growth Forest
HCVOGF impact locations*

* Please refer to map figures 5-6 to 5-12

Figure 5-6 Heritage item number 33, High Conservation Value Old Growth Forest (Location 1)

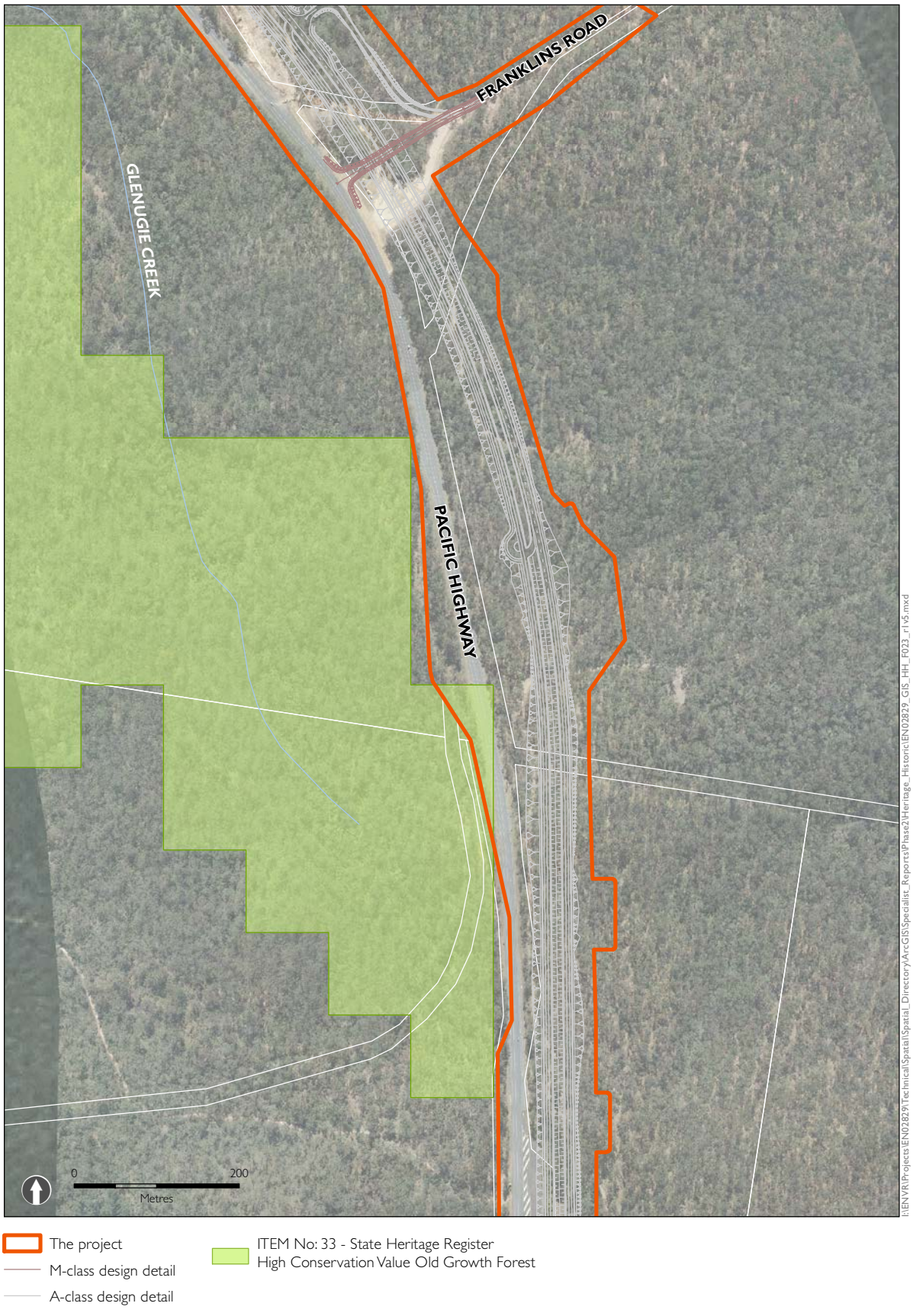


Figure 5-7 Heritage item number 33, High Conservation Value Old Growth Forest (Location 2)

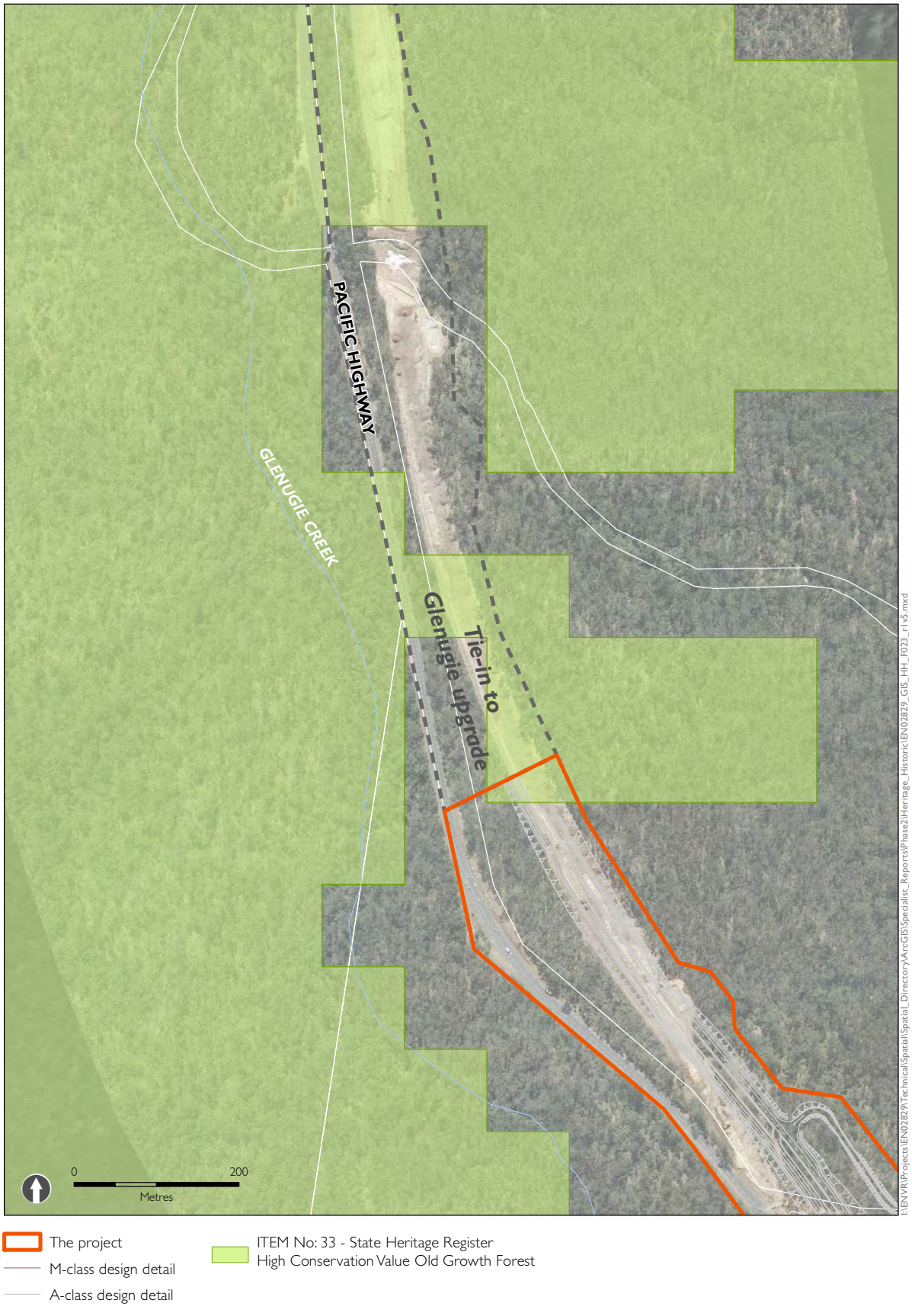


Figure 5-8 Heritage item number 33, High Conservation Value Old Growth Forest (Location 3)

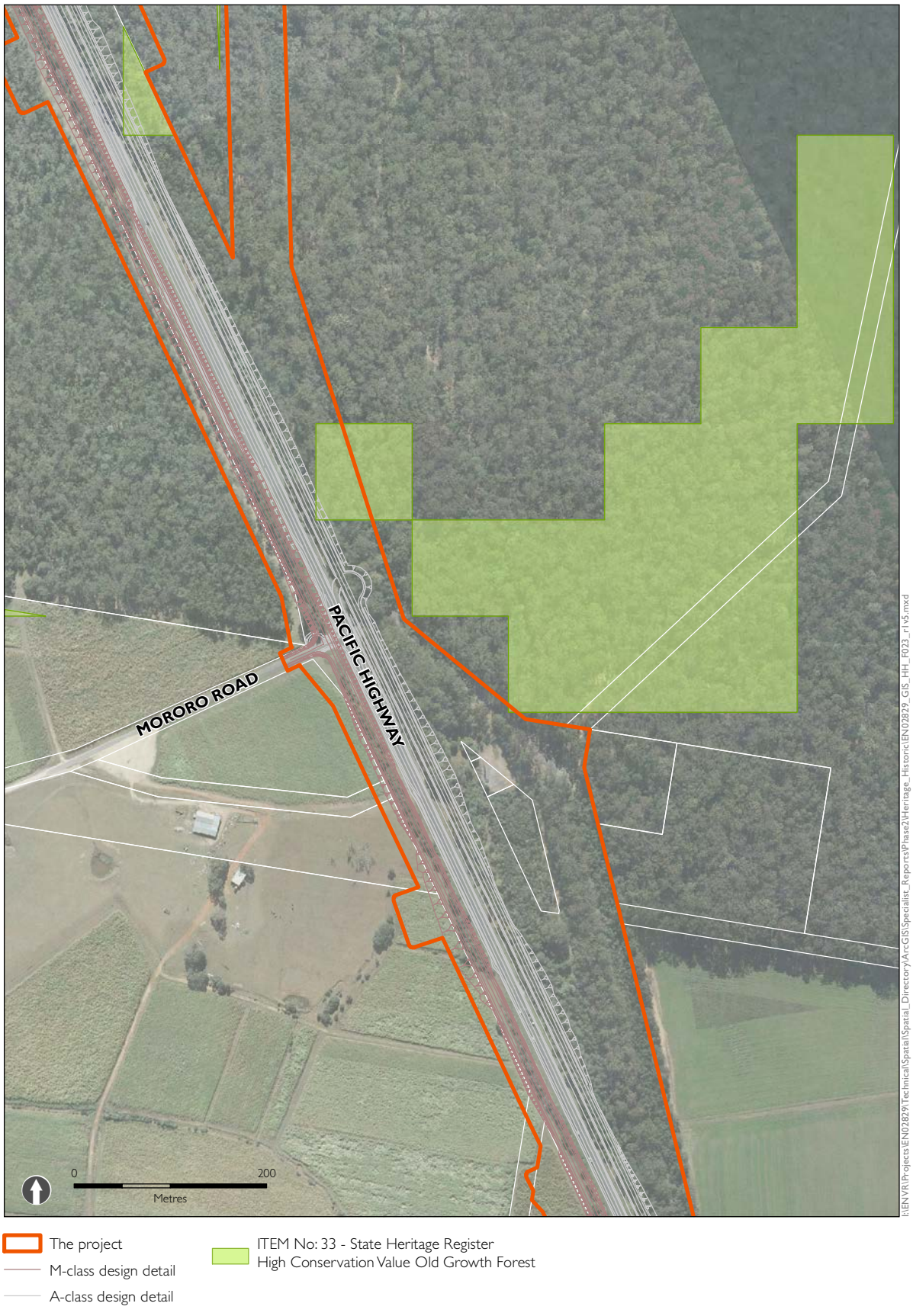


Figure 5-9 Heritage item number 33, High Conservation Value Old Growth Forest (Location 4)

Figure 5-10 Heritage item number 33, High Conservation Value Old Growth Forest (Location 5)

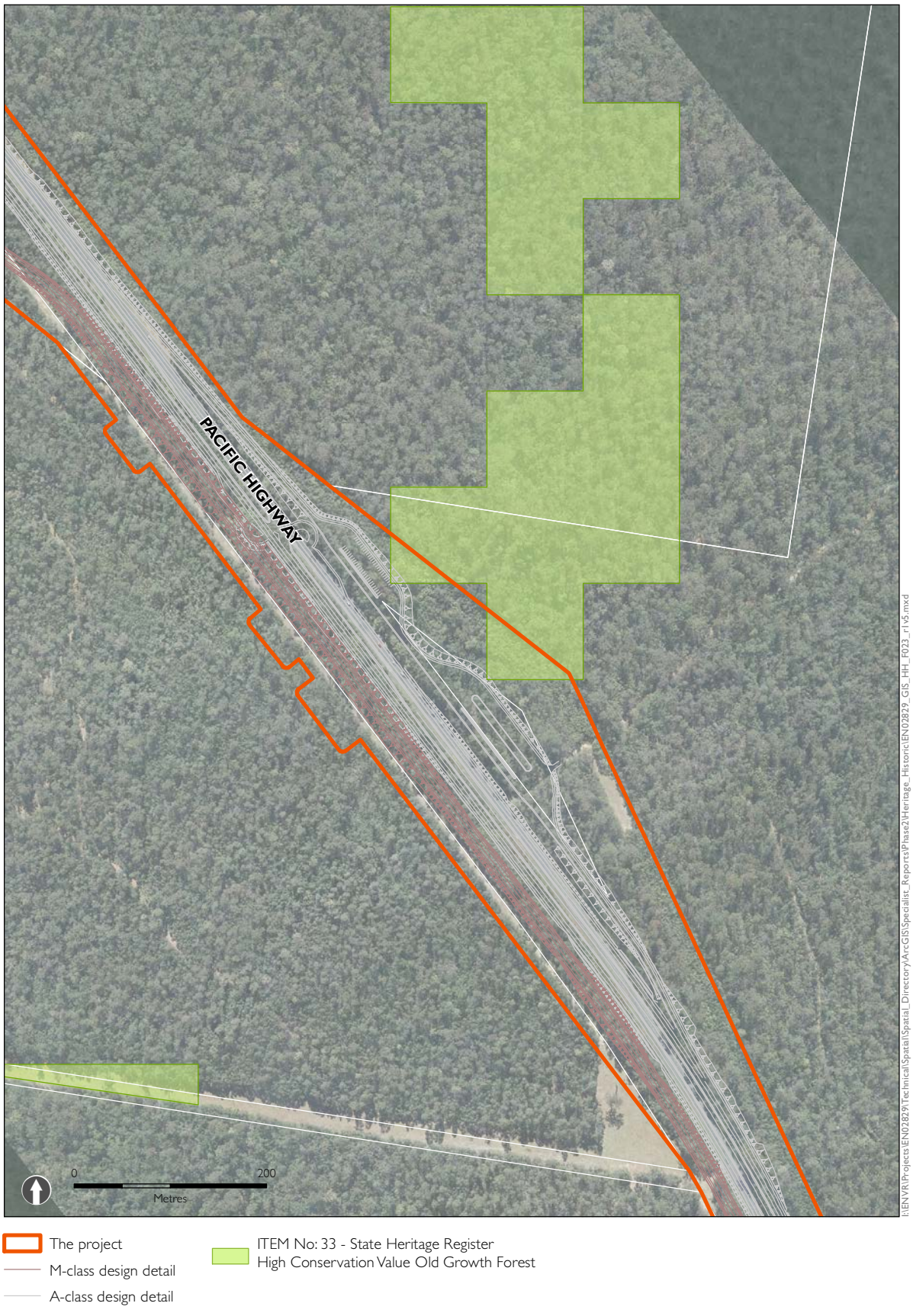


Figure 5-11 Heritage item number 33, High Conservation Value Old Growth Forest (Location 6)

Figure 5-12 Heritage item number 33, High Conservation Value Old Growth Forest (Location 7)

### 5.4.14. Item 34: Townsend residence, Townsend

#### Site details

Item 34 is situated at 3 Jubilee Street, Townsend on Lot 1 DP501255 in Section 4. The site comprises a modified 1870s cottage. The property is listed on the Clarence Valley Local Environmental Plan (2011) and the State Heritage Inventory as item 1990024. The site is of local heritage significance meeting significance **criterion C** (demonstrating aesthetic characteristics and/or a high degree of creative or technical achievement). See Appendix A.34 for full site description, photographs and significance assessment.

#### Proposed works

The project would be located immediately to the west of the heritage item and includes upgrade of the highway to dual carriageway.

This SOHI has been prepared by Karen Murphy (Archaeologist, SKM).

#### Impact assessment

*The following aspects of the proposal respect or enhance the heritage significance of the item for the following reasons:*

The project has no direct impact on the heritage item.

*The following aspects of the proposal could detrimentally impact on heritage significance. The reasons are explained as well as the measures to be taken to minimise impacts:*

- The residence has been identified for architectural noise treatment to control noise levels from the highway. Architectural treatment could include a range of noise controls. These noise controls are generally considered to be the most cost-effective solution for isolated residents where noise barriers and/or low-noise pavements are not feasible. Examples generally include sealing off wall vents, upgrading windows, glazing and solid core doors within the noise exposed façade(s). Also, providing air conditioning or ventilation systems to meet the Building Code of Australia requirements for fresh air is a further example of a control measure that could be used at an affected property. For these measures to be effective, the property must be in a reasonable state of repair. The noise controls would be developed in consultation with a qualified heritage consultant to minimise impacts on the heritage significance of the item. A more detailed SOHI would be prepared when the specific architectural noise treatments for the residence are identified. Given the high level of modification of the residence, impact on significance is likely to be low.

### 5.4.15. Item 35: Six Mile Tick Gate Remains, Glenugie

#### Site details

Item 35 is situated beside the Pacific Highway on Lot 20 DP1123940 in the Glenugie State Forest and on Pacific Highway road reserve in Section 2. The site comprises the remains of the tick gate operations which ran from 1932 until 1977. The western half of the site including two concrete slabs related to the tick gate cubicle/office and lunch room, was demolished during construction of the Franklins Road Heavy Vehicle Inspection Site in 2009. The remains on the eastern half of the site including a large concrete slab likely related to living quarters for the gatekeeper, a fenceline and other blocks of concrete are still in existence. The site was assessed by Heritage Concepts (2007) and was subject to a complete heritage photographic recording by Roads and Traffic Authority in 2008 prior to construction of the vehicle inspection site. The site is of local heritage significance meeting significance **criterion A** (historical). The site is not currently listed of any state or local heritage register or list. See Appendix A.35 for full site description, photographs and significance assessment.

#### Proposed works

The project includes the upgrade of the highway adjacent to the east of the existing Pacific Highway. The project would require the demolition of the remainder of the site not previously destroyed by the heavy vehicle inspection site near Franklins Road.

This SOHI has been prepared by Karen Murphy (Archaeologist, SKM).

#### Impact assessment

*The following aspects of the proposal respect or enhance the heritage significance of the item for the following reasons:*

The project would involve the complete demolition of the remainder of the Six Mile Lane Tick Gate site. There are no aspects of the project which enhance or respect the heritage significance of the heritage item.

*The following aspects of the proposal could detrimentally impact on heritage significance. The reasons are explained as well as the measures to be taken to minimise impacts:*

- Complete destruction of the remainder of the site from road construction. At least half of the site has previously been destroyed as part of the construction of the Franklins Road Heavy Vehicle Inspection Site following heritage impact assessment by Heritage Concepts (2007). Photographic recording of the site was recommended as a mitigation measure in the heritage impact assessment and recording was undertaken by Roads and Traffic Authority (2008) prior to construction of the vehicle inspection site. The destruction of half the site has reduced the site's significance as evidence of key standard components of tick

gate design have been destroyed. The appropriate mitigation measure for the remainder of the site would be photographic recording. As this has already been undertaken, no further mitigation measures would be undertaken for the project.

### 5.4.16. Item 36: North Coast Railway Branch Tramway, Glenugie

#### Site details

Item 36 is situated on both sides of the Pacific Highway and along its existing alignment on Lot 74 DP751380 in the Glenugie State Forest and on Pacific Highway road reserve in Section 2. The site comprises remains of the alignment of a 1915 branch tramway used to transport basalt from Glenugie Peak to the North Coast Railway during its construction. The remains include a levelled, linear ground platform; approximately 3 m wide, with minor cuts or benching and some shallow side embankments in the area to the east of the Pacific Highway near Franklins Road. There are no apparent physical remains along the alignment of the Pacific Highway. The site was identified by Navin Officer (2009a) as part of the Glenugie Upgrade project. Approval to destroy this section of the site was granted under the Glenugie Upgrade project approval. The site is of local heritage significance meeting significance **criterion A** (historical), **criterion B** (associative), **criterion E** (potential to yield information), **criterion F** (rarity), and **criterion G** (principal characteristics). The site is not currently listed of any state or local heritage register or list. See Appendix A.36 for full site description, photographs and significance assessment.

#### Proposed works

The project includes the upgrade of the highway to the east of the existing highway and upgraded access to and from Franklins Road.

This SOHI has been prepared by Karen Murphy (Archaeologist, SKM).

#### Impact assessment

*The following aspects of the proposal respect or enhance the heritage significance of the item for the following reasons:*

The tramway alignment travels south from the intersection of Franklins Road and the existing Pacific Highway for approximately one kilometre following the existing alignment of the highway. As the tramway alignment is either directly under or immediately adjacent to the west of the existing Pacific Highway, there is unlikely to be any remains of the tramway structure due to previous highway construction works. Parts of this section of the tramway alignment are just outside the project boundary. The project works are situated between 15 metres and 75 metres to the east of the existing highway and would not impact on any tramway remains that are present along the existing highway alignment.

*The following aspects of the proposal could detrimentally impact on heritage significance. The reasons are explained as well as the measures to be taken to minimise impacts:*

- Destruction of the approximately 250 metre remnant of the tramway alignment in the vicinity of the existing intersection of Franklins Road and Pacific Highway. This remnant represents less than 3% of the overall length of the original tramway.

There is no intact evidence of tramway construction materials or items associated with its use (such as wooden sleepers, metal objects or the remains of hopper trucks) at that location. Only the earthen embankments remain. The previous heritage impact assessment for this area (Navin Officer 2009a) recommended archival photographic recording of this area of the tramway alignment, however this was not undertaken as the Glenugie Upgrade avoided the site. An archival photographic recording would be undertaken in accordance with the Heritage Branch guidelines prior to destruction, as part of the Woolgoolga to Ballina Upgrade.

Implementing the mitigation measure would reduce the impact on the significance of the heritage item by recording as much relevant information as possible about the tramway alignment before its demolition.

### 5.4.17. Item 38: Cemetery Reserve, Broadwater

#### Site details

Item 38 is situated on Lot 7008 DP92609 on the south east outskirts of the township of Broadwater in Section 9, and lies immediately north of the Maloney Property (Item 26). The site comprises a cemetery reserve declared in 1895 with no surface evidence of grave markers or burials but local knowledge of the site as a cemetery. The site is of local heritage significance meeting significance **criterion A** (historical). The site is not currently listed on any state or local heritage register or list. See Appendix A.38 for full site description and significance assessment.

#### Proposed works

The project includes the upgrade of the highway immediately to the south and east of the cemetery reserve with the Broadwater interchange to the east. The south east corner of the reserve is within the project boundary however the road embankment in the design is about five metres outside the cemetery reserve boundary.

This SOHI has been prepared by Karen Murphy (Archaeologist, SKM).

#### Impact assessment

*The following aspects of the proposal respect or enhance the heritage significance of the item for the following reasons:*

The project boundary minimises the area of the cemetery reserve that would be impacted, and is limited to an area of the reserve least likely to hold burials due to its swampy, low-lying nature. Additionally, the assessed road design situates the road embankment of the upgrade outside the reserve boundary, thereby respecting the significance of the heritage item.

*The following aspects of the proposal could detrimentally impact on heritage significance. The reasons are explained as well as the measures to be taken to minimise impacts:*

- Potential ground disturbance during road construction activities due to the close proximity of the road embankment to and overlap of the project boundary with the reserve boundary. The area of the reserve within the project boundary is a grassed, low-lying area subject to inundation and is unlikely to contain burials. In the unlikely event that evidence of burials (such as obvious sediment differentiation, or remains of grave markers of other funerary material) is identified during construction activities the management measures detailed in section 6.1.1

(*Discovery of historical heritage materials, features or deposits*) would be implemented. If human skeletal material is identified the management measures detailed in section 6.1.2 (*Discovery of human remains*) would be implemented.

- Potential ground disturbance of the heritage item outside the project boundary if road construction machinery accidentally enters the cemetery reserve, due to the high level of construction activity surrounding the reserve. To protect the heritage item the boundary of the reserve would be clearly identified on site/construction plans as an area of exclusion, and temporary barrier fencing would be constructed continuously along the project boundary:
    - immediately south of the cemetery reserve
    - where it crosses the south east corner of the cemetery reserve, and
    - where it follows the east boundary of the cemetery reserve.

# 6. Mitigation and management

## 6.1. General management measures

### 6.1.1. Discovery of historical heritage materials, features or deposits

If at any time during construction of the project, historical heritage materials, features and/or deposits are found the NSW Roads and Maritime Services' *Standard Management Procedure: Unexpected Archaeological Finds* (2011) would be followed. Specifically the following actions would be undertaken:

- All construction that could potentially harm the historical heritage materials, features or deposits would cease (including stopping all construction within at least 10 metres). Only construction that is required to comply with occupational and environmental health and safety standards and/or to protect the historical heritage would occur. Construction that does not have the potential to harm the historical heritage would continue only if it is outside the minimum 10 metre buffer
- The on-site supervisor would inform Roads and Maritime Service environment staff of the discovery
- A suitably qualified and experienced archaeologist (the archaeologist) would be contacted as soon as practicable in relation to the unexpected discovery of any historical heritage and would be responsible for recording, in detail, the location and context of any historical heritage. Any materials, features and/or deposits would be analysed and/or catalogued and any official site records would be created or updated (where appropriate). The archaeologist would also make recommendations for the management of the historical heritage in relation to the project
- It is preferable to avoid impacts on historical heritage where possible. If avoidance is not possible, the archaeologist would conduct a salvage excavation. The aims of the salvage excavation would be to obtain as much information as possible from the historical heritage materials, features and/or deposits
- The archaeologist would provide a report detailing the excavation, salvage and analysis results to the Heritage Branch of the Office of Environment and Heritage at the completion of the salvage
- NSW Roads and Maritime Services would be responsible for the costs associated with the assessment, cataloguing, labelling, packaging etc of any historical heritage materials, features and/or deposits

- Work would recommence within the area of exclusion:
    - When the appropriate protective measures have been implemented
    - Where the relevant records have been updated and/or completed
    - Where all parties agree there is no other prudent or feasible course of action.

### 6.1.2. Discovery of human remains

In the event that construction of the project reveals possible human skeletal material (remains) the following procedure would be implemented:

- As soon as remains are exposed, all construction would halt at that location immediately and the on-site supervisor would be immediately notified to allow assessment and management
- The on-site supervisor would notify the Environmental Representative, NSW Roads and Maritime Services Project Manager and NSW Roads and Maritime Services Senior Environmental Officer
- The on-site supervisor would contact police
- The on-site supervisor would contact the Office of Environment and Heritage's Environment Line on 131 555 and the Heritage Branch of the Office of Environment and Heritage on (02) 9873 8500
- A physical or forensic anthropologist would inspect the remains in situ (organised by the police unless otherwise directed by the police) and make a determination of ancestry (Aboriginal or non-Aboriginal) and antiquity (pre-contact, historic or forensic)
- If the remains are identified as forensic, the area would be deemed a crime scene
- If the remains are identified as Aboriginal, the site would be secured and the Office of Environment and Heritage and all Aboriginal stakeholders would be notified in writing
- If the remains are identified as non-Aboriginal (historical) remains, the site would be secured and the Heritage Branch of the Office of Environment and Heritage would be contacted.

The above process functions only to appropriately identify the remains and secure the site. From this time, the management of the area and remains would be determined through one of the following means:

- If the remains are identified as a forensic matter, management of the area would be determined through liaison with the police
- If the remains are identified as Aboriginal, management of the area would be determined through liaison with NSW Roads and Maritime Services, the Office of Environment and Heritage, the Department of Planning and Infrastructure (DP&I) and registered Aboriginal stakeholders
- If the remains are identified as non-Aboriginal (historical), management of the area would be determined through liaison with NSW Roads and Maritime Services, the Heritage Branch of the Office of Environment and Heritage and the DP&I
- If the remains are identified as not being human, then work would recommence once the appropriate clearances have been given.

### 6.1.3. Heritage induction training

Non-Aboriginal historical heritage awareness training would be provided for contractors prior to commencement of construction works to ensure understanding of potential heritage items that may be impacted during the project, and the procedure required to be undertaken in the event of discovery of historical heritage materials, features or deposits, or the discovery of human remains.

### 6.1.4. Ancillary sites

The following management measures apply to the nine ancillary sites identified in the assessment as having medium potential for the presence of previously unrecorded or unknown historical heritage sites (Table 3-6).

Before the commencement of the use of the ancillary facilities area for the project, field survey would be undertaken by a suitably qualified and experienced heritage consultant. Any historical heritage items identified would be assessed for their level of significance. For those heritage items identified as being of state or local heritage significance an impact assessment would be undertaken and provided to the Heritage Branch of the Office of Environment and Heritage.

Where local or state significant heritage items are identified on an ancillary site and use of the site would impact on the heritage significance of the item, the site would not be used for ancillary facilities.

Where local or state significant heritage items are identified on an ancillary site and use of the site would not impact on the heritage significance of the item, appropriate management measures (such as barrier fencing) would be put in place to clearly identify the heritage item and exclude use of the ancillary site within the heritage item's curtilage. Use of these ancillary facilities may commence:

- When the appropriate protective measures have been implemented
- When the relevant records have been updated and/or completed.

Should any new ancillary facility locations not identified as part of this assessment be considered for use, a historical heritage assessment would be undertaken, with a database search and site survey to identify any potential heritage items. If items are found, the above process would be followed.

### 6.1.5. Items not impacted

Those items that would not be impacted by the project but would be adjacent to the project boundary would be clearly identified on site plans for the project. Additionally any revisions to the detailed project design would be checked for any changes to heritage impacts on these items. These measures would apply to the items listed in Table 6-1.

**Table 6-1: Heritage items not impacted.**

| Project section | Item no | Item name |
|---|---|---|
| 1 | 3 | Tree stumps, Milleara/Halfway Creek |
| 4 | 10 | Tyndale shed and cane barracks |
| 4 | 34 | Townsend residence |
| 5 | 13 | 'Highfield' Residence, James Creek |
| 5 | 14 | James Creek Residence, James Creek |
| 5 | 15 | Harwood School Residence |
| 5 | 16 | Harwood School |
| 5 | 18 | Harwood Water Brigade Hall |
| 5 | 19 | Harwood War Memorial |
| 7 | 24 | Vineyard Haven, New Italy Settlement |
| 8 | 25 | Woodburn Slaughterhouse, Trustrums Hill |
| 10 | 30 | Bamboo stands, Properties 723 and 725, Wardell |

## 6.2. Site-specific management measures

The following impact mitigation and management measures would apply at specific sites that have been identified as being subject to impact due to the activities associated with construction of the project. The management and mitigation measures for each direct or indirect impact identified in the SOHIs are detailed for each site below. The mitigation measures identified are best practice heritage management measures which have been consistently applied across all projects in the Pacific Highway Upgrade Program (see Table 5-6).

### 6.2.1. Item 2: House, Sheds and Stockyards, Milleara

The following measures apply to the upgrade:

- Construction of the batter slope may cause damage to the stockyards due to the close proximity of the project. As a protective measure a temporary barrier fence would be erected between the stockyards and the works area prior to road construction works commencing. The fence would remain in place until the conclusion of the works in the vicinity of the items at which time it would be removed. The batter slope would not be constructed within five metres of the stockyards
- Physical damage to the stockyards if road construction materials blow or spill onto them. To protect the stockyards and reduce their exposure to road construction materials, particularly dust, the mitigation measures for maintaining air quality and dust control as detailed in the proposed air quality management plan would be implemented. This plan would address spoil and stockpile handling, machinery operating procedures and monitoring of impacts. Sediment control would also be put in place in between the road and the stockyards prior to road construction works commencing and would remain in place until the conclusion of the works in the vicinity of the stockyard, at which time it would be removed.
- The house has been identified for architectural noise treatment to control noise levels from the highway. The noise controls would be developed in consultation with a qualified heritage consultant to minimise impacts on the heritage significance of the item. A more detailed SOHI would be prepared when the specific architectural noise treatments for the house are identified.

### 6.2.2. Item 7: Service Station Complex, Halfway Creek

The following measures apply to the upgrade:

- Ground disturbance during road construction of the class M upgrade, particularly batter slope on existing carpark area, impacting on potential archaeological remains of the original coach waystation and coach road. The impacts would be mitigated through the opportunity to undertake archaeological investigation in the carpark area between the building and the existing highway. Archaeological investigations at the site would be undertaken as follows:
    - Salvage excavation to be undertaken in an area extending from the project boundary running along the front of the complex buildings to the edge of the existing highway prior to construction commencing in the vicinity of the heritage item (Area of Archaeological Potential on Figure 7-28)

  - Salvage excavation to be undertaken in accordance with the Heritage Branch of the Office of Environment and Heritage guidelines including an appropriate research design and methodology in order to best realise the research potential of this area of the site
  - Salvage excavation undertaken under the supervision of an appropriately qualified and experienced historical archaeologist in accordance with the Heritage Branch of the Office of Environment and Heritage criteria

- Construction of the batter slope for the class M upgrade may cause damage to the bar/restaurant building due to the close proximity of the project. As a protective measure a temporary barrier fence would be erected between the bar/restaurant building and the works area prior to road construction works commencing in the vicinity of the heritage item. The barrier fence would remain in place until the conclusion of the road works at which time it would be removed. The batter slope would not be constructed within eight metres of the bar/restaurant building
- Physical damage to the bar/restaurant building if road construction materials blow or spill onto it, during class M upgrade construction. To protect the building and reduce its exposure to road construction materials, particularly dust, the mitigation measures for maintaining air quality and dust control as detailed in the proposed air quality management plan would be implemented. This plan would address spoil and stockpile handling, machinery operating procedures and monitoring of impacts. Sediment control would also be put in place in between the road and the stockyards prior to road construction works commencing and would remain in place until the conclusion of the works in the vicinity of the stockyard, at which time it would be removed
- While vibration caused during construction is unlikely to damage the structural integrity of the bar/restaurant building during the class M upgrade, a photographic dilapidation survey would be undertaken of the current condition and damage to the bar/restaurant building prior to construction commencing in the vicinity. In the unlikely event of damage caused during construction this would be repaired once construction is complete.
- The old residence has been identified for architectural noise treatment to control noise levels from the highway. The noise controls would be developed in consultation with a qualified heritage consultant to minimise impacts on the heritage significance of the item. A more detailed SOHI would be prepared when the specific architectural noise treatments for the residence are identified.

### 6.2.3. Item 11: Tyndale Residence, Tyndale

The following measures apply to the upgrade:

- Potential impacts on the mature bunya trees would be managed during the works. Prior to the start of the works, the location and condition of the bunya trees would be recorded by an arborist. In consultation with an arborist, protective fencing would be erected to avoid impacts to any trees that might be adjacent to the property boundary.
- The residence has been identified for architectural noise treatment to control noise levels from the highway. The noise controls would be developed in consultation with a qualified heritage consultant to minimise impacts on the heritage significance of the item. A more detailed SOHI would be prepared when the specific architectural noise treatments for the residence are identified.

### 6.2.4. Item 12: Cane Barge and Former Ashby Ferry, Maclean

The following measures apply to the upgrade:

- Potential impact on the level of visitation to the site due to the batter slope obscuring the view of the heritage items from the road. The installation of appropriate directional signage on both the northbound and southbound highway approach to the site would be undertaken to help maintain a high level of awareness regarding the heritage item's existence
- Vibration generated during construction may damage the structural integrity of the heritage items. A photographic dilapidation survey would be undertaken of the current condition and damage to the Ashby ferry prior to construction commencing in the vicinity Prior to any road construction works commencing any loose or unstable components of the former Ashby ferry and the sugarcane hoist would be secured and would remain secured until the conclusion of the road works at which time they would be removed. Any methods used to secure components would be reversible and not cause damage to the Ashby ferry and sugarcane hoist
- Physical damage to the exterior surfaces of each heritage item if road construction materials blow or spill onto the heritage items. To protect the heritage items and reduce their exposure to road construction materials, particularly dust, the mitigation measures for maintaining air quality and dust control as detailed in the proposed air quality management plan would be implemented. This plan would address spoil and stockpile handling, machinery operating procedures and monitoring of impacts. Sediment control would also be put in place in between the road and the stockyards prior to road construction works commencing and would

remain in place until the conclusion of the works in the vicinity of the stockyard, at which time it would be removed.

### 6.2.5. Item 17: Harwood Tram Tracks, Harwood

The following measures apply to the upgrade:

- Damage from construction traffic associated with the proposed bridge construction works. To protect the Petticoat Lane Tram Tracks section during bridge construction works, the tram tracks would have a protective covering placed over them, for example, a geo textile fabric and heavy duty metal sheeting or similar. The covering would be secured in place prior to road construction works commencing and would remain in place until the conclusion of the road works at which time it would be removed
- No measures are required at the Old Pacific Highway Tram Tracks section.

### 6.2.6. Item 20: Harwood Bridge, Harwood

The design of the new bridge would be undertaken in accordance with *Bridge Aesthetics: Design Guidelines to Improve the Appearance of Bridges in NSW* (RMS 2012) with specific reference to the section 7.1, *New bridges next to existing bridges*. This would contribute towards the mitigation of visual and aesthetic impacts on the existing Harwood Bridge.

### 6.2.7. Item 21: Convent, Harwood

The following measures apply to the upgrade:

- Complete demolition of the Convent building for construction of the bridge across the Clarence River. Discussions with community members indicate that the relocation of the Convent would be highly regarded by the community. To maintain the Convent's local heritage significance the building would be relocated to an appropriate site elsewhere within the boundaries of the Harwood Heritage Conservation Area in consultation with the community. The relocation would be undertaken by an appropriately qualified house removal contractor in consultation with an appropriately qualified heritage consultant. Archival photographic recording would be made of the heritage item and its surrounds in accordance with the Heritage Branch of the Office of Environment and Heritage guidelines prior to its relocation.

### 6.2.8. Item 23: New Italy Settlement Landscape, New Italy

#### New Italy Settlement (State Heritage Register 1648, Local Environmental Plan I148) (Figure 5-2)

The following impact mitigation and management measures apply to the class A upgrade:

- Physical damage to the exterior surfaces of heritage items if road construction materials blow or spill onto the items. To protect the heritage items and reduce their exposure to road construction materials, particularly dust, the mitigation measures for maintaining air quality and dust control as detailed in the proposed air quality management plan would be implemented. This plan would address spoil and stockpile handling, machinery operating procedures and monitoring of impacts. Sediment control would also be put in place in between the road and the stockyards prior to road construction works commencing and would remain in place until the conclusion of the works in the vicinity of the stockyard, at which time it would be removed
- Physical damage to exterior and structural integrity of heritage items if road construction machinery enters or ground surface disturbance occurs within State Heritage Register boundary, due to close proximity of the project. To protect the heritage items within the State Heritage Register boundary protective barrier fencing would be constructed in between the construction area and the heritage items prior to construction works commencing in the vicinity of the item and would remain in place until the conclusion of those road works at which time they would be removed
- While vibration caused during construction is unlikely to damage the structural integrity of the heritage items, a photographic dilapidation survey would be undertaken of the current condition and damage to the heritage items prior to construction commencing in the vicinity. In the unlikely event of damage caused during construction this would be repaired once construction is complete.

Additional indirect impacts due to the proposed class M upgrade would be managed as follows:

- Removal of direct access from the highway to the museum complex and removal of carpark facilities reducing visitor amenity and ease of accessibility for visitors. Conspicuous signage relating to the New Italy museum complex would be installed at both the interchange at Woodburn and interchange at Iluka Road to divert visitors onto the service road in order to access the museum complex.

### Memorial and Stone-Lined Well (Local Environmental Plan I150) (Figure 5-2)

The following impact mitigation and management measures apply to the class A upgrade:

- Direct impact on the memorial and flagpole requiring the removal/demolition of the memorial and flagpole from their current location. Prior to any road construction works commencing the memorial and flagpole would be:
- Subject to an archival photographic recording in accordance with the Heritage Branch of the Office of Environment and Heritage guidelines and a dilapidation survey.
- Removed from their current location and reinstated within the boundaries of Lot 1 DP207390 and outside the project boundary to the north of the stone-lined well. This work would be undertaken under the supervision of an appropriately qualified monumental stonemason and a qualified heritage professional.

The following impact mitigation and management measures apply to the upgrade:

- Physical damage to the exterior surfaces of the stone-lined well, memorial and flagpole and the interior of the stone-lined well if road construction materials blow or spill onto/into the heritage items. To protect the memorial and stone lined well and reduce their exposure to road construction materials, particularly dust, the mitigation measures for maintaining air quality and dust control as detailed in the proposed air quality management plan would be implemented. This plan would address spoil and stockpile handling, machinery operating procedures and monitoring of impacts. Sediment control would also be put in place in between the road and the stockyards prior to road construction works commencing and would remain in place until the conclusion of the works in the vicinity of the stockyard, at which time it would be removed
- Physical damage to exterior and structural integrity of heritage items if road construction machinery enters or ground surface disturbance occurs close to the heritage items, due to close proximity of the project. To protect the heritage items protective barrier fencing would be constructed in between the construction area and the heritage items, leaving a buffer of at least five metres around the heritage items, prior to road construction works commencing in the vicinity of the items and would remain in place until the conclusion of the road works at which time it would be removed
- While vibration caused during construction is unlikely to damage the structural integrity of the heritage items, a photographic dilapidation survey would be undertaken of the current condition and damage to the stone-lined well and the relocated memorial and flagpole prior to construction commencing in the vicinity. In the unlikely event of damage caused during construction this would be repaired once construction is complete.

The following impact mitigation and management measures apply to the class M upgrade only:

- Removal of direct access from highway to museum complex and removal of carpark facilities. Conspicuous signage relating to the New Italy museum complex would be installed at both the interchange at Woodburn and interchange at Iluka Road to divert visitors onto the service road in order to access the museum complex.

### Roder's Stone-lined Well and Orchard (Local Environmental Plan I149) (Figure 5-3)

The following measures apply to the class A upgrade:

- Destruction of the stone-lined well. Impacts would be mitigated to some extent through the opportunity to undertake archaeological investigation of the site. Archaeological investigations at the site would be undertaken as follows:
- Salvage excavation to be undertaken in an area including the well and the adjacent wall
- Salvage excavation to be undertaken in accordance with the Heritage Branch of the Office of Environment and Heritage guidelines including an appropriate research design and methodology in order to best realise the research potential of this area of the site
- Salvage excavation undertaken under the supervision of an appropriately qualified and experienced historical archaeologist in accordance with the Heritage Branch of the Office of Environment and Heritage criteria
- Physical damage to the physical integrity and health of the mango orchard if road construction machinery enters or ground surface disturbance occurs close to the heritage items, due to close proximity of the project. To protect the mango orchard protective barrier fencing would be constructed in between the construction area and the heritage items, leaving a buffer of at least five metres around the heritage items, prior to road construction works commencing in the vicinity of the items and would remain in place until the conclusion of those road works at which time it would be removed
- Physical damage to the mango orchard if road construction materials blow or spill onto/into the heritage items. . To protect the orchard and reduce its exposure to road construction materials, particularly dust, the mitigation measures for maintaining air quality and dust control as detailed in the proposed air quality management plan would be implemented. This plan would address spoil and stockpile handling, machinery operating procedures and monitoring of impacts. Sediment control would also be put in place in between the road and the stockyards prior to road construction works commencing and would remain in

place until the conclusion of the works in the vicinity of the stockyard, at which time it would be removed

- While vibration caused during construction is unlikely to damage the mango orchard, the location and condition of each of the trees in the orchard would be recorded by an arborist.

The following measures apply to the class M upgrade only:

- Demolition of the mango orchard through the construction of service road adjacent to highway. An archival photographic recording would be made of the mango orchard and its surrounds in accordance with the Heritage Branch of the Office of Environment and Heritage guidelines prior to its demolition.

### Historic New Italy Village Area (Local Environmental Plan Section 6.4)

The following impact mitigation and management measures apply to the upgrade:

- Physical impact on lots within the Historic New Italy Village Area where there are no known physical remains related to the New Italy Settlement in the impact area. If any historical heritage remains are discovered during works the management measures detailed in section 6.1.1 – Discovery of historical heritage materials, features or deposits, would be applied.

## 6.2.9. Item 26: Maloney Property, Broadwater

The following measures apply to the upgrade:

- Complete demolition of the dairy and buttery/creamery. An archival photographic recording would be made of the buttery/creamery, the dairy and its surrounds in accordance with the Heritage Branch of the Office of Environment and Heritage guidelines prior to demolition.
- The homestead has been identified for architectural noise treatment to control noise levels from the highway. The noise controls would be developed in consultation with a qualified heritage consultant to minimise impacts on the heritage significance of the item. A more detailed SOHI would be prepared when the specific architectural noise treatments for the homestead are identified.

### 6.2.10. Item 27: Meerschaum Vale Brickworks, Wardell

The following measures apply to the upgrade:

- Ground disturbance activities of the project may damage or destroy the remains of the site. If brick material or any other historical heritage remains are discovered during works the management measures detailed in section 6.1.1 – Discovery of historical heritage materials, features or deposits, would be applied.

### 6.2.11. Item 28: Byrne Property, Broadwater

The following measures apply to the upgrade:

- Physical impacts on the stone quarry, the small clay pit, the brick-lined well and domestic artefacts or features potentially situated beneath the ground surface by construction and ground disturbance activities. Archaeological investigations at the site would be undertaken prior to construction as follows:
    - Retention of the brick-lined well in situ and protection from all impacts
    - Archival photographic recording of the stone quarry and small clay pit in accordance with the Heritage Branch of the Office of Environment and Heritage guidelines
    - Archaeological excavation of the impact area of the site situated to the south of the quarry
    - Salvage excavation to be undertaken in accordance with the Heritage Branch of the Office of Environment and Heritage guidelines including an appropriate research design and methodology in order to best realise the research potential of this area of the site
    - Salvage excavation undertaken under the supervision of an appropriately qualified and experienced historical archaeologist in accordance with the Heritage Branch of the Office of Environment and Heritage criteria.

The following measures apply specifically to the brick-lined well should geotechnical investigations require blasting activities in close proximity to the heritage item:

- A detailed assessment of the level of vibration at the brick-lined well based on factors including distance from the blast site and the quantity of the explosive, and modelling of the predicted vibration levels at the brick-lined well
- A photographic dilapidation survey and structural audit of the current condition and damage to the brick-lined well.

Dependant on the outcome of the detailed vibration assessment and the dilapidation survey and structural audit the following mitigations measures would be considered to mitigate impacts on the brick-lined well:

- Construction of temporary or permanent supports or shoring within the brick-lined well
- Stabilisation of the brick-lined well
- Installation of vibration monitoring devices.

At the completion of any geotechnical blasting activities a further dilapidation survey / structural audit and condition report would be prepared and any resultant damage restored.

The following measures apply specifically to the brick-lined well during construction activities:

- Vibration generated during construction may damage the structural integrity of the brick-lined well due to close proximity and the sandy nature of the surrounding sediments. If not already undertaken as part of prior geotechnical investigations, a photographic dilapidation survey would be undertaken of the current condition and damage to the brick-lined well prior to construction commencing in the vicinity. Prior to any road construction works commencing in the vicinity of the heritage item any loose or unstable components of the well would be secured and would remain secured until the conclusion of the work. Any methods used to secure components would be reversible and not cause damage to the brick-lined well
- Permanent physical damage to the interior surfaces of the well if road construction materials blow or spill into the well. To protect the well and reduce its exposure to road construction materials, particularly dust, the mitigation measures for maintaining air quality and dust control as detailed in *Air Quality and Greenhouse Gas Assessment* would be implemented. Sediment control would also be put in place prior to construction commencing in the vicinity and would remain in place until the conclusion of the work
- Physical damage to the interior surfaces of the well if road construction materials blow or spill into the well. To protect the heritage items and reduce their exposure to road construction materials, particularly dust, the mitigation measures for maintaining air quality and dust control as detailed in the proposed air quality management plan would be implemented. This plan would address spoil and stockpile handling, machinery operating procedures and monitoring of impacts. Sediment control would also be put in place in between the road and the stockyards prior to road construction works commencing and would remain in place until the conclusion of the works in the vicinity of the stockyard, at which time it would be removed
- Due to the proximity of the well to the roadway, consideration may be made as part of construction to prevent ongoing pedestrian access to the well. Any measures to

close the well would ensure that the well could be accessed in the future for heritage research or other purposes and that no detrimental physical impact on the well occurs.

### 6.2.12. Item 29: 'Stonehenge' Property, Wardell

The following measures apply to the upgrade:

- Complete demolition of the main residence and destruction of a large section of the drainage canal on the property. An archival photographic recording would be made of the main residence and the drainage system and its surrounds in accordance with the Heritage Branch of the Office of Environment and Heritage guidelines prior to its demolition. A detailed survey and recording of the location of the drainage system within the 'Stonehenge' property would also be undertaken.
- The 1940s residence has been identified for architectural noise treatment to control noise levels from the highway. The noise controls would be developed in consultation with a qualified heritage consultant to minimise impacts on the heritage significance of the item. A more detailed SOHI would be prepared when the specific architectural noise treatments for the residence are identified.

### 6.2.13. Item 32: Harwood Heritage Conservation Area, Harwood

The following measures apply to the upgrade:

- Convent building on 12 River Street (Item 21): Discussions with community members indicate that the relocation of the Convent (Item 21) would be highly regarded by the community. To maintain the Convent's local heritage significance the building would be relocated to an appropriate site elsewhere within the boundaries of the Harwood Heritage Conservation Area in consultation with the community. NSW Roads and Maritime Services have acquired land in Harwood which may be suitable for relocation of the Convent building. The relocation would be undertaken by an appropriately qualified house removal contractor in consultation with an appropriately qualified heritage consultant. Archival photographic recording would be made of the heritage item and its surrounds in accordance with the Heritage Branch of the OEH guidelines prior to its relocation
- Petticoat Lane section of the Harwood Tram Tracks (Item 17): The tram tracks would have a protective covering placed over them, for example, a geo textile fabric and heavy duty metal sheeting or similar. The covering would be secured in place prior to road construction works commencing and would remain in place until the conclusion of the road works at which time it would be removed

- There are no specific impact mitigation measures able to reduce the impact on the aesthetic significance of the Harwood Bridge.

### 6.2.14. Item 33: High Conservation Value Old Growth Forest

The destruction of the heritage item would be limited to a small proportion (0.001 per cent) of the total listed area. The impact has been minimised through the route selection for the project boundary and the road design. During detailed design, further consideration would be given to minimising the area of Forest to be cleared. The area to be cleared would be clearly identified through on-site markers, such as flagging tape. High Conservation Value Old Growth Forest adjacent to these areas to be cleared would be fenced to avoid accidental disturbance on further areas.

### 6.2.15. Item 34: Townsend Residence, Townsend

The following measures apply to the upgrade:

- The residence has been identified for architectural noise treatment to control noise levels from the highway. The noise controls would be developed in consultation with a qualified heritage consultant to minimise impacts on the heritage significance of the item. A more detailed SOHI would be prepared when the specific architectural noise treatments for the residence are identified.

### 6.2.16. Item 35: Six Mile Tick Gate Remains, Glenugie

Photographic recording of the entire site has previously been undertaken as part of the construction of the Franklins Road Heavy Vehicle Inspection Site. No further impact mitigation measures would be required prior to destruction of the remainder of the site.

### 6.2.17. Item 36: North Coast Railway Branch Tramway, Glenugie

The following measures apply to the upgrade:

- Destruction of the approximately 250 metre remnant of the tramway alignment in the vicinity of the existing intersection of Franklins Road and Pacific Highway. The previous heritage impact assessment for this area (Navin Officer 2009a) recommended archival photographic recording of this section of the tramway alignment. If this has not already been undertaken as part of the Glenugie Upgrade works, an archival photographic recording would be undertaken in accordance with the Heritage Branch guidelines prior to destruction.

### 6.2.18. Item 38: Cemetery Reserve, Broadwater

The following measures apply to the upgrade:

- Potential ground disturbance during road construction activities due to the close proximity of the road embankment to and overlap of the project boundary with the reserve boundary. In the unlikely event that evidence of burials (such as obvious sediment differentiation, or remains of grave markers of other funerary material) is identified during construction activities the management measures detailed in section 6.1.1 (*Discovery of historical heritage materials, features or deposits*) would be implemented. If human skeletal material is identified the management measures detailed in section 6.1.2 (*Discovery of human remains*) would be implemented.
- Potential ground disturbance of the heritage item outside the project boundary if road construction machinery accidentally enters the cemetery reserve, due to the high level of construction activity surrounding the reserve. To protect the heritage item the boundary of the reserve would be clearly identified on site/construction plans as an area of exclusion, and temporary barrier fencing would be constructed continuously along the project boundary:
    - immediately south of the cemetery reserve
    - where it crosses the south east corner of the cemetery reserve, and
    - where it follows the east boundary of the cemetery reserve.

# 7. Conclusion

## 7.1. Key findings of the assessment

This report has assessed the potential impacts on the non-Aboriginal heritage values for the proposed upgrade to the Pacific Highway from Woolgoolga to Ballina. Through heritage register searches, review of previous heritage studies, historical research and field survey a total of 38 heritage items were identified. Assessment of the heritage significance of these items, identified three of state level significance, 27 of local significance and eight that did not meet the criteria thresholds for either local or state significance.

Impact assessment revealed that of the 30 significant heritage items, 12 were not subject to any impacts from the project. The other 18 heritage items would be subject to a range of direct and indirect impacts during the construction phase of the project. The mitigation measures that would be put in place for these 18 heritage items include the following range of outcomes:

- Protective measures resulting in avoidance of impacts to heritage significance
- Relocation of heritage item while maintaining heritage significance
- Realisation of the information/research potential of heritage item through archaeological salvage excavation or archival recording prior to destruction.

Ancillary sites for the project have been subject to desktop assessment. Of the 81 ancillary sites proposed for the project nine were identified as having a medium likelihood of the presence of previously unrecorded or unknown historical heritage sites. Field survey, significance assessment and impact assessment of these nine sites would be undertaken in parallel with the Environmental Impact Statement.

This assessment also considers the Pacific Highway itself from a heritage perspective, and undertakes a significance assessment of the Highway as a whole, and the impacts of this project on the Highway. The majority of the remaining evidence of the earlier highway route and infrastructure would not be impacted by the project. Overall the impact of the project on the heritage significance of the Pacific Highway is negligible. Therefore there are no mitigation measures required for the Pacific Highway.

General mitigation measures for the management of impact of non-Aboriginal heritage items from the project would also be implemented. These include a procedure for managing the discovery of historical heritage materials, features or deposits not identified by this assessment, a procedure for managing the discovery of human remains, and the provision of heritage induction training for contractors working on the construction of the project.

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