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Lot 112 DP1073791 Lyons Road, Bonville, NSW - Proposed Land Subdivision

Part 3A project under the provisions of the State Environmental Planning Policy (Major Projects) 2005

Cultural heritage assessment

Prepared on behalf of

Utila Pty Ltd
PO Box 399
Toormina NSW 2452

Report: May 2010

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ACRONYMS

AHIMS	Aboriginal Heritage Information Management System
AHIP	Aboriginal Heritage Impact Permit
AMG	Australian Map Grid
BCA	Bonhomme Craib & Associates
CHCC	Coffs Harbour City Council
CHLALC	Coffs Harbour & District Local Aboriginal Land Council
DECCW	Department of Environment Climate Change & Water
DGRs	Director-General's Requirements
DOP	NSW Department of Planning
EA	Environmental Assessment
EP&A Act	Environmental Planning and Assessment Act 1979
GDA	Geocentric Datum of Australia
GPS	Global Positioning System
LGA	Local Government Area
NPWS Act	National Parks and Wildlife Service Act 1974
PAD	Potential Archaeological Deposit
UTM	Universal Transverse Mercator

Executive Summary

Utila Pty Ltd (Utila) proposes to undertake a residential land subdivision at Lot 112 DP1073791, Lyons Road, Bonville, New South Wales. The proposal is a Major Project application for residential subdivision in accordance with Part 3A of the *Environmental Planning and Assessment Act 1979* and State Environmental Planning Policy (Major Projects) 2005. Under Section 75U Part 3A of the Act certain exemptions are granted for approvals/permits which includes Section 87 permits (Permits relating to Aboriginal Objects) under the *National Parks and Wildlife Act 1974*.

The Department of Planning (DOP) Director General's Environmental Assessment Requirements (DGRs) issued for the project note the DOP still requires an equivalent level of information with the Environmental Assessment as would ordinarily be required for any such approval/permit to enable an assessment of the relevant works.

The requirements for heritage are listed in Section 8. Heritage and Archaeology as follows:

- 8.1 Identify whether the site has significance to Aboriginal cultural heritage and identify appropriate measures to preserve any significance in accordance with the Draft Guidelines for assessment of impacts on Aboriginal heritage under part 3A. Aboriginal community consultation should be undertaken in accordance with the Department of Environment and Climate Change (DECCW) Interim community consultation requirements for applicants.
- 8.2 Identify any items of European heritage significance and where relevant provide measures for the conservation f such items.

The DECCW Director-General's Environmental Assessment (EA) requirements for the study area state:

- The EA should address and document the information requirements set out in the draft Guidelines for Aboriginal Cultural Heritage Impact Assessment and Community Consultation" involving survey and consultation with the Aboriginal community.
- Identify the nature and extent of impacts on Aboriginal cultural heritage values across the project area
- The extent and significance of this site will need to assessed and preferably any development in this area would avoid disturbance of the site
- Describe the action that will be taken to avoid or mitigate impacts or compensate to prevent unavoidable impacts of the project on Aboriginal cultural heritage values. This should include an assessment of the effectiveness and reliability of the measures and any residual impacts after these measures are implemented.
- The EA needs to clearly demonstrate that effective community consultation with Aboriginal communities has been undertaken in determining and assessing impacts, developing options and making final recommendations.

This report was commissioned by Utila to address cultural heritage issues associated with the proposed development. The report includes

- the results of the consultation undertaken in line with the *Draft Guidelines for Aboriginal Cultural Heritage Impact Assessment and Community Consultation* (Department of Environment Climate Change and Water - DECCW, 2005),
- the results and recommendations arising from survey of the development area and
- the results and recommendations of the test excavations undertaken in November 2009. The recommendations of the cultural heritage assessment will form the Heritage and Archaeology component of the Environmental Assessment for the Lot 112 subdivision proposal.

To comply with the requirements, the cultural heritage assessment included:

- Searches of relevant heritage registers to identify any existing or proposed heritage listings in the study area;
- Literature review to identify previous relevant cultural heritage work conducted in the area, including consideration of the first survey work in the area in 2004;
- Consultation with Aboriginal stakeholders in accordance with the DECCW (2004) *Interim Community Consultation Requirements for Applicants* to ensure that the Aboriginal community has the opportunity to influence the assessment design, provide relevant information regarding the cultural significance values of the area and to contribute to the development of cultural heritage management recommendations;
- A field survey in conjunction with Aboriginal stakeholder representatives;
- A preliminary assessment of the significance of the area and the potential impacts of the development proposal to the Aboriginal cultural significance values of the area based on the survey results;

- Recommendations, developed in conjunction with Aboriginal stakeholders, to investigate the archaeological potential of the ridge areas and watercourse on the Lot to address the concerns of the Aboriginal stakeholders that Aboriginal cultural material may be present in these areas;
- Development of a research design, in conjunction with Aboriginal stakeholders, to ensure an adequate testing of PADs within the Lot;
- Test excavation of PADs in Lot 112;
- An assessment of the Aboriginal cultural/social significance and the scientific/archaeological significance of the Lot and Aboriginal objects identified during the excavation; and
- Management recommendations and mitigation strategies to inform the development process.

The Project

Lot 112 comprises 38.49 hectares of land located off Lyons Road, North Bonville, within the Coffs Harbour LGA in the Bonville Valley. It is west of the coastal town of Sawtell and is approximately 10 kilometres south of the Coffs Harbour city centre. The western and southern site boundaries abut Bongil Bongil National Park and the eastern boundary adjoins an environmental protection area (see Figure 3).

The development is a residential subdivision comprising:

- 151 low density residential lots;
- 42 medium density dwelling residential lots;

Approximately one-third of the site is zoned 7(e) Environmental Protection. This portion of the Lot will not be disturbed by the proposed development.

Lot 112, including the ridges and slopes, has been previously cleared for agricultural purposes and crop cultivation. Clearing, logging and ploughing has occurred repeatedly since European settlement of the area (around 1863) and, coupled with the movement of grazing stock over the Lot, disturbance to the majority of the original ground surface is likely to have occurred.

Disturbance occurred when the south east ridge crest was graded to form a less pronounced slope during vegetation clearing and when a borrow pit was established on the western ridge. The borrow pit disturbance complied with the Coffs Harbour City Council (CHCC) Landform Modification conditions and was approved by the CHCC. Topsoil from the borrow pit was stripped and stockpiled on the east and west sides of the borrow pit. The topsoil was then respread over the borrow pit after underlying material had been removed.

Searches and results

Indigenous cultural heritage

The relevant heritage registers were searched as part of the background information obtained for the project.

- The DECCW Aboriginal Heritage Information Management System) lists sites in the vicinity. Except for the Lyons Road PAD (AHIMS #22-1-0357), none of the registered sites occur within Lot 112. AHIMS site #22-1-0225/22-1-0298 is the closest site to Lot 112 and is located on the adjacent Lot 2 DP1065589 approximately 200 m to the north.

Searches of the following registers were made:

- Commonwealth and National Heritage Registers (Department of Environment, Water, Heritage and the Arts);
- NSW State Heritage Register;
- Schedule 2 (Heritage Items) of the North Coast Regional Environmental Plan 1988; and
- Schedule 5 (Heritage Items) of the Coffs Harbour Local Environmental Plan 2000.

Searches of the following databases were made for the Coffs Harbour LGA (16th September 2009):

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

No entries for Aboriginal sites close or within the study area were found in the Coffs Harbour LGA documents.

Non Indigenous (European/Other) cultural heritage

Searches of the following registers of Non Indigenous sites were made:

- Australian Heritage Database;
- NSW State Heritage Register;
- National Trust of Australia (NSW) Register;
- Schedule 2 (Heritage Items) of the North Coast Regional Environmental Plan 1988; and
- Schedule 5 (Heritage Items) of the Coffs Harbour Local Environmental Plan 2000.

No historical sites or items were listed in or close to the study area.

Consultation

Note Department of Environment Climate Change and Water (DECCW) is now the Department of Environment and Climate Change (DECCW). Reference is made to DECCW where appropriate. To meet the Director-General requirements for projects in relation to Part 3A (EP&A Act) approvals, the '*Guidelines for Aboriginal Cultural Heritage Impact Assessment and Community Consultation'* (DECCW 2005) stipulate that the Aboriginal heritage assessment must establish the 'Cultural Landscape' of the study area. The 'Cultural Landscape' information includes the physical setting (landscape), the history of peoples living on that land (social/cultural information) and the material evidence (archaeological information) (DECCW 2005). The social and cultural information is gathered through a process of community consultation and documentation in accordance with the '*Interim Community Consultation Requirements for Applicants*' (DECCW 2004). These consultation requirements outline a number of steps to ensure that the Aboriginal community has the opportunity to participate in the assessment process through comment, the contribution of cultural knowledge to inform the assessment and consideration of the values and concerns that may be expressed by the community.

In accordance with the DECCW requirements, the following Aboriginal organisations were mailed notification that Lot 112 was proposed for developed as an urban residential subdivision and invited to register an interest in the project:

- The Coffs Harbour Local Aboriginal Land Council (CHLALC)
- The Bagawa Birra Murri Aboriginal Corporation
- Gumbular-Julipi Elders Council
- Gumbaynggirr Warrior Elders of the Nambucca River
- Gumbaynggirr Native Title Group and Gumbaynggirr Nation
- Gumbaynggirr Elders
- Mudjay Elders
- Kulai Pre School Aboriginal Corporation
- Stuarts Island Local Aboriginal Land Council
- Garby Elders Group
- Office of the Registrar
- Native Title Services
- Coffs Harbour City Council
- Department of Environment Climate Change and Water (Coffs Harbour)
- Department of Environment Climate Change and Water (Sydney)

A newspaper notice was published in the Coffs Coast Advocate (Weekend Edition) on the 13th December 2008.

Two Aboriginal organisations responded and were registered as stakeholders:

- The Coffs Harbour Local Aboriginal Land Council; and
- The Bagawa Birra Murri Aboriginal Corporation.

DECCW also responded and provided a list of Aboriginal organisations that should be contacted as part of the consultation; however these organisations had already been sent a letter of invitation.

The registered stakeholders were notified that an assessment would be conducted and sent a map of the Lot. Comments on the assessment and an indication of any involvement the organisation wished to have were requested by letter. The Coffs Harbour Local Aboriginal Land Council (CHLALC) indicated that they would be available to participate in the survey. A further letter was sent to the Bagawa Birra Murri Aboriginal Corporation again requesting an indication of their wishes for involvement in the assessment. No further response was received from this organisation.

A survey of the Lot was completed on the 23rd January 2009, with the CHLALC. The CHLALC indicated that a subsurface testing program should be undertaken and indicated that they would continue their involvement

with the assessment through participation in the testing. In accordance with the DECCW requirements, a copy of the draft Cultural Heritage Survey Report for Lot 112, Lyons Road Bonville, and the Research Design for Testing of Potential Archaeological Deposits was mailed to the registered stakeholders with an invitation to comment on any issues or areas of cultural heritage significance that may affect, inform or refine the proposed methodology.

A further request was also made at this time to the Bagawa Birra Murri Aboriginal Corporation asking if they wished to be involved with the assessment. No further response was received from this organisation. A meeting was arranged with the CHLALC to discuss the research design for testing of the PADs and to obtain a Care Agreement for Aboriginal objects.

No comments on the draft Cultural Heritage Survey Report or the research design were made by the CHLALC or received from Bagawa Birra Murri Aboriginal Corporation. The report and the research design were deemed to have been accepted by the stakeholders and finalised.

In accordance with the DECCW requirements, the registered stakeholders were provided with a copy of the final Cultural Heritage Survey Report by registered mail. The finalised research design was also sent with the report.

Letters were sent (Registered Mail) to the stakeholders advising them of the status of the 3A application and providing copies of the survey report and the methodology and research design for the test excavation (29/9/09). No comments were received on either document.

Test excavation was undertaken with the CHLALC and a draft report was prepared. The stakeholders were notified that the draft report was available for comment.

A letter was sent to the DOP advising of the status of the assessment and that the draft report was available for comment by the stakeholders (24/3/10).

Stakeholders were advised that the draft report was available and the CHLALC was provided a copy for comment. The CHLALC responded that the recommendations were as agreed but asked for further clarification of the wording of Recommendation 1. This was provided to their satisfaction see (copies of correspondences Appendix 2).

Stakeholders were advised that the final report was available.

Test Excavation

Test excavations were undertaken from the 2nd November 2009 to the 19h November 2009 with the assistance of a team of CHLALC senior sites officers and CHLALC experienced labourers. A final walk over and debriefing was held on 20th November 2009. Section 6 'Field investigations' details the survey and test excavation results.

The landform types investigated during the subsurface testing included the low slope above the water course, mid to upper slope and ridge crest which had varying degrees of post European disturbance. One hundred and forty four test pits were excavated (totalling 64.8 cu m – 216 sq m) across the 15 main transects. The test pits were placed at 10 m intervals along 1400 linear metres across the site. Four test pits were established around 2A -7 to investigate a concentration of artefacts.

Test pits were placed along the ridge crest, the upper slopes and along the lower slopes facing the watercourse which trends north to the wetland. As a result of the initial transect excavation results (Tr 1-5) additional transects were placed at Transect 1b, 1c, 2b, 3b, c, d, e, Transect 2 was extended 50 m to the north west and Transect 2b was investigated at 5 m intervals north south east and west around a high concentration at Test Pit 2a -7. Inspections of the borrow pit surface located a further 40 artefacts and a general surface collection across the site located a further 55 artefacts.

The area has been cleared through the 20th century and used for grazing. A five year period in the 1960s saw the operation of a banana plantation. The south east slopes have been modified in profile during clearing of dense scrub and pushing of top soil from the ridge crest onto the south east facing slope.

There is evidence of the removal of large trees in the past resulting in depressions of up to 40 cm depth across the hill slope. The area had been ploughed and used for cultivation in the recent past resulting in significant disturbance of the top soil. Areas of disturbance were found particularly along transects 2and 3

where areas of introduced gravels and glass fragments were found suggestive of work areas (sheds) associated with the banana plantation which operated for a brief period (c 5 years) on the lot.

Disturbance consisted of tree roots and later tree removal, ploughing and other farm activities. Nevertheless movement of artefacts appears to have been minimal and may be restricted to vertical displacement within the upper A horizon. The focus on site appears to be on making and using heavy duty side choppers. River cobbles brought to the site were split producing most of the debitage. Material is mainly coarse grained however a limited selection of fine grained material producing elongate flakes found. Cores were found on coarse and fine grained material. White quartz was being worked but is represented in low numbers. The technique for producing flakes was percussion with no evidence of bipolar technique.

The physical remains across the slope are high in number with three definite concentrations along each of the ridge crests. They represent purposeful manufacture and use of heavy duty choppers presumably to utilise the resources of the surrounding wetlands and hinterland slopes. The sample collected through excavation and surface collections provides useful information regarding the general patterns of behaviour at this local and these can be compared with surrounding sites to create a greater understanding of human behaviour in the cultural landscape.

The CHLALC walked a line from the lagoon in the Bongil Bongil National Park north up slope to Transect 2a along Transect 2 and 1 south to Lyons Road. It was their opinion that this route was an easy transit route from the river into the Boambee Valley to the north.

Further subsurface excavation within the current development area is not recommended because

- the extensive subsurface testing programme carried out indicates that additional excavation would produce similar results.
- the CHLALC are satisfied that the site has been investigated to its potential.

The scientific significance of the site has been assessed as high. The site has provided insight into use of hinterland gullies and swamp areas behind the coastal zone by indicating that the area has probably been accessed to undertake short term gathering or foraging activities.

The significance of the material found during the sub surface programme was discussed with the representatives of the CHLALC. The representatives considered the material to have a high scientific and educational significance and asserted that the material was culturally significant as it provided evidence of Aboriginal use of the area.

Particularly the material demonstrates the repeated use of the ridge areas which access Bonville Creek to the south and the Boambee Creek Valley.

The following recommendations are based on:

- the results of the excavation conducted on the Lot between 2nd November and 20h November 2009;
- discussions held with the CHLALC senior sites officer during, and at the conclusion of, the excavation work;
- the concerns and wishes of the CHLALC; and
- the current plans for the proposed residential development.

Recommendation 1

Remove the ridge topsoil on all ridges within the development area including the outer perimeter roadways located on the ridges. This work will take place prior to any other construction activity occurring on the site. The topsoil will be removed to a reserve area (determined by the CHLALC and the developer). No other activity will occur until this work is complete.

Recommendation 2

Record the relocated location of the ridge topsoil as a relocated site with DECCW Aboriginal Heritage Information Management System.

Recommendation 3

Relocation of ridge topsoil should be monitored by CHLALC.

Recommendation 4

After the ridge topsoil has been relocated, a walkover of the removal areas should be conducted by the CHLALC and any visible artefacts collected.

Recommendation 5

Collected artefacts will be redeposited by CHLALC representatives in a secure location on site negotiated between Utila PL and the CHLALC.

Recommendation 6

Street names in the development should acknowledge the Traditional Owners of the area. Consultation with the CHLALC and the CHCC should be undertaken to ascertain suitable names for the streets

Development impact and mitigation

The development will impact the ridges and slopes across the lot with the establishment of a residential precinct with associated infrastructure. A riparian zone will be created along the central gully but water management facilities will be established within the zone and these will impact artefacts present along the water course.

A Management Plan and Work Methodology (Section 6.3) has been developed to manage the identified and potential cultural heritage issues associated with the sites.

This management plan has been reviewed by Utila and has been accepted. Utila agrees to involve the stakeholders in the implementation of the plan.

1 INTRODUCTION

1.1 Background

Utila Pty Ltd (Utila) proposes to undertake a residential land subdivision at Lot 112 DP1073791 Lyons Road, Bonville, NSW. The proposal is a Major Project application for residential subdivision in accordance with Part 3A of the *Environmental Planning and Assessment Act 1979* and State Environmental Planning Policy (Major Projects) 2005. Under Section 75U Part 3A of the Act certain exemptions are granted for approvals/permits which includes Section 87 permits (Permits relating to Aboriginal Objects) under the *National Parks and Wildlife Act 1974*.

This report was commissioned by Utila to address cultural heritage issues associated with the proposed development. The report includes

- the results of the consultation undertaken in line with the *Draft Guidelines for Aboriginal Cultural Heritage Impact Assessment and Community Consultation* (Department of Environment Climate Change and Water - DECCW, 2005),
- the results and recommendations arising from survey of the development area and
- the results and recommendations of the test excavations undertaken in November 2009. The recommendations of the cultural heritage assessment will form the Heritage and Archaeology component of the Environmental Assessment (EA) for the project.

1.2 Location of Lot 112 (the study area)

GDA map reference 506479E 6640744 N (approximate central point)
Coffs Harbour 9537-3N, 1:25,000 topographic map, Edition 3

Lot 112 comprises 38.49 hectares of land south of Lyons Road, North Bonville, within the Coffs Harbour Local Government Area (LGA) in the Bonville Valley, approximately 10 kilometres south of the Coffs Harbour city centre. The western and southern site boundaries abut Bongil Bongil National Park and the eastern boundary adjoins a wetland zoned 7(e) Environmental Protection. This portion of the Lot will not be disturbed by the proposed development. Figure 1 shows the general locality and Figure 2 shows the study area.

1.3 The development proposal

The residential subdivision includes:

- 151 low density residential lots; and
- 42 medium density dwelling residential lots.

Lot 112 comprises 38.49 hectares of land located off Lyons Road, North Bonville, within the Coffs Harbour

1.4 Assessment requirements

The Department of Planning Director General's Environmental Assessment Requirements (DGRs) issued for the project note that the Department of Planning still requires an equivalent level of information with the Environmental Assessment as would ordinarily be required for any such approval/permit to enable an assessment of the relevant works. The requirements for heritage are listed in Section 8. Heritage and Archaeology as follows:

- 8.1 Identify whether the site has significance to Aboriginal cultural heritage and identify appropriate measures to preserve any significance in accordance with the Draft Guidelines for assessment of impacts on Aboriginal heritage under part 3A. Aboriginal community consultation should be undertaken in accordance with the Department of Environment and Climate Change (DECCW) Interim community consultation requirements for applicants.

- 8.2 Identify any items of European heritage significance and where relevant provide measures for the conservation f such items.

The DECCW Director-General's Environmental Assessment (EA) requirements for the study area are:

- The EA should address and document the information requirements set out in the draft Guidelines for Aboriginal Cultural Heritage Impact Assessment and Community Consultation" involving survey and consultation with the Aboriginal community.

- Identify the nature and extent of impacts on Aboriginal cultural heritage values across the project area.
- The extent and significance of this site will need to be assessed and preferably any development in this area would avoid disturbance of the site.
- Describe the action that will be taken to avoid or mitigate impacts or compensate to prevent unavoidable impacts of the project on Aboriginal cultural heritage values. This should include an assessment of the effectiveness and reliability of the measures and any residual impacts after these measures are implemented.
- The EA needs to clearly demonstrate that effective community consultation with Aboriginal communities has been undertaken in determining and assessing impacts, developing options and making final recommendations.

To comply with the requirements, the cultural heritage assessment included:

- Searches of relevant heritage registers to identify any existing or proposed heritage listings in the study area;
- Literature review to identify previous relevant cultural heritage work conducted in the area;
- Consultation with Aboriginal stakeholders in accordance with the DECCW (2004) *Interim Community Consultation Requirements for Applicants* to ensure that the Aboriginal community has the opportunity to influence the assessment design, provide relevant information regarding the cultural significance values of the area and to contribute to the development of cultural heritage management recommendations;
- A field survey in conjunction with Aboriginal stakeholder representatives;
- A preliminary assessment of the significance of the area and the potential impacts of the development to the Aboriginal cultural significance values of the area based on the survey results;
- Recommendations, developed in conjunction with Aboriginal stakeholders, to investigate the archaeological potential of the Lot;
- Development of a research design, in conjunction with Aboriginal stakeholders, to ensure an adequate testing of the Lot;
- Test excavation;
- An assessment of the Aboriginal cultural/social significance and the scientific/archaeological significance of the Lot and Aboriginal objects identified during the excavation; and
- Management recommendations and mitigation strategies to inform the development process.

1.4 Legislative background

Approval for the proposed development is being sought under Part 3A of the NSW *Environmental Planning and Assessment Act 1979* (EP&A Act).

Under section 75U of the EP&A Act, Part 3A applications do not require certain permits/approvals required under other legislation. These matters are assessed as part of the Part 3A process. Permits and consents under Section 87 and Section 90 (Part 6) of the *National Parks and Wildlife Act 1974* are not required for development related works that may impact of Aboriginal cultural heritage.

Notwithstanding, the NSW Department of Planning (DOP) requires an equivalent level of information within the Environmental Assessment (EA) as would ordinarily be required for any such permit/approval to enable an assessment of the Aboriginal cultural heritage values of the development area.

Specifically, the Director-General's Environmental Assessment Requirements (DGRs) key issues include Heritage and Archaeology and require that the EA must identify whether the site has significance to Aboriginal cultural heritage and identify appropriate measures to preserve any significance in accordance with the *Draft Guidelines for Aboriginal Cultural Heritage Impact Assessment and Community Consultation* (DECCW 2005).

Aboriginal community consultation was undertaken in accordance with the *Interim Community Consultation Requirements for Applicants* (DECCW 2004). Further discussion of consultation is included in Section 6 and Appendix 3 details the consultation process.

The NSW DOP will consider the heritage issues and consult with DECCW to ensure any such issues are considered prior to granting project approval. The proponent will be required to manage Aboriginal cultural heritage issues in accordance with the conditions set out by the Minister for Planning and these may include the management recommendations.

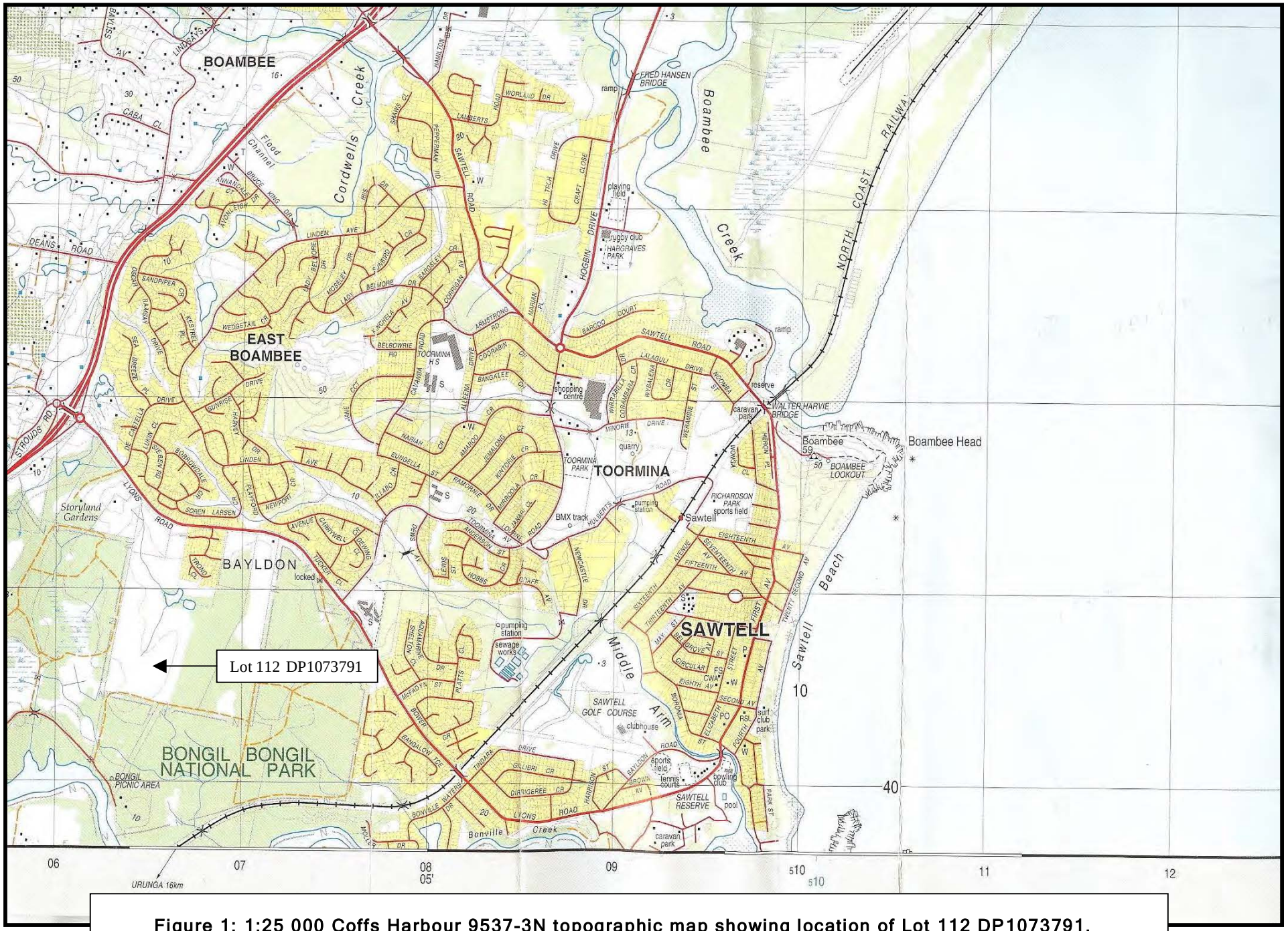

Figure 1: 1:25 000 Coffs Harbour 9537-3N topographic map showing location of Lot 112 DP1073791.

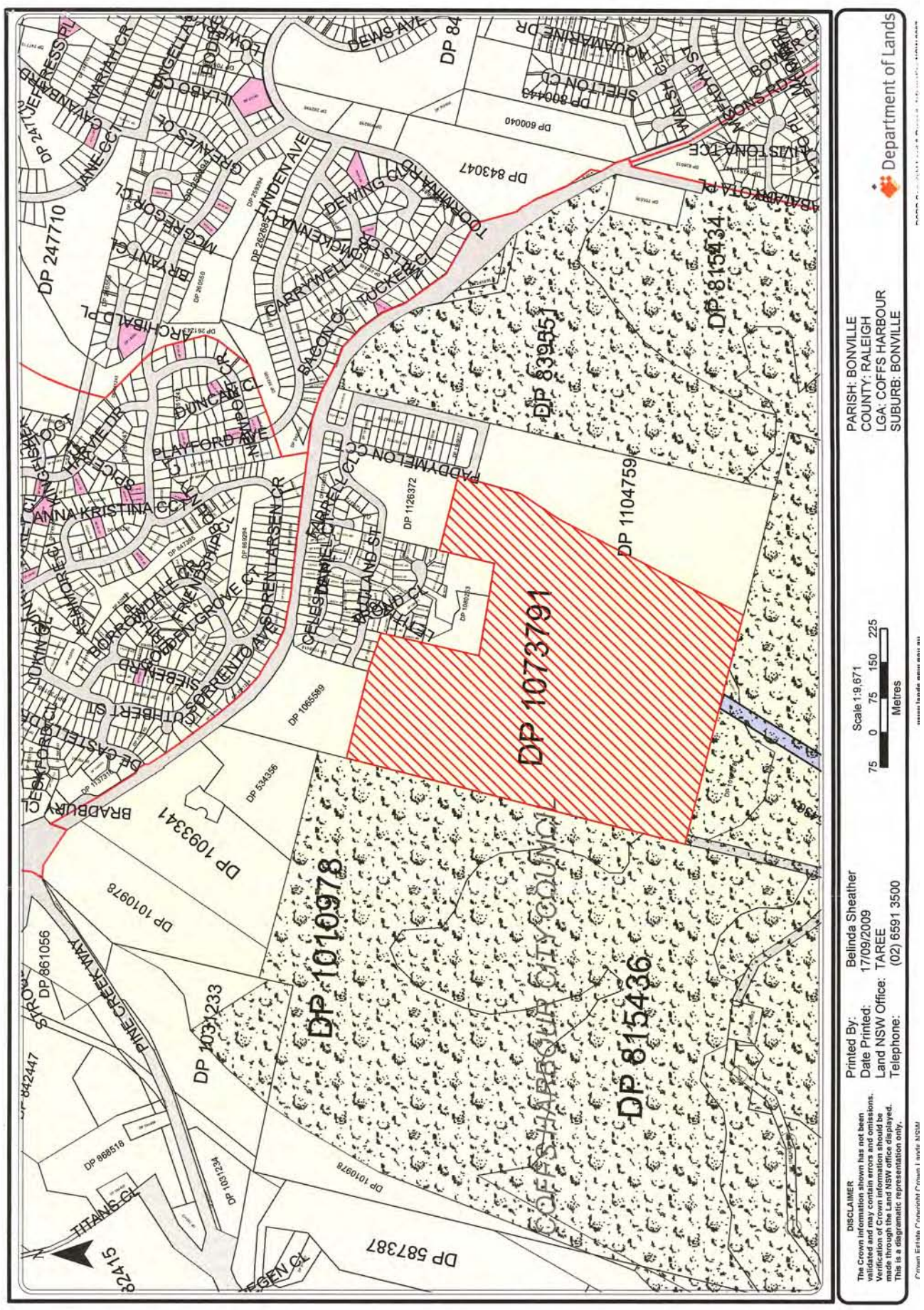

Figure 2: Lot 112 DP1073791 – the study area (Department of Lands 2009).

2 ENVIRONMENTAL CONTEXT

2.1 General setting

Bonville is situated on the mid-north coast of New South Wales; approximately 10 kilometres south of Coffs Harbour near the township of Sawtell (refer Figure 1). The plain is drained by the Bonville and Pine Creek estuary, with the Middle Creek tributary draining into Bonville Creek. Bonville lies within the NSW North Coast Biogeographic Region which has been identified as being of particular importance for flora and fauna as is falls within the zone of overlap between the tropical and temperate zones (Biosis Research Pty Ltd 1998). Much of the Bonville area is undeveloped with the majority of urban expansion occurring in the Sawtell area and residential precincts of Bayldon and Toormina located in the Middle Creek catchment in the north-east of the area. The Bongil Bongil National Park lies in the south of the area. It has an area of approximately 978 ha and is considered to be of high conservation value. It contains diverse vegetation types, littoral rainforests and wetlands that have been identified in State Environment Planning Policies as being of State significance.

The area is underlain by the *Brooklana Formation* of Carboniferous age which is part of the *Coffs Harbour Block* and dominated by siltstone (Milford 1999). The area generally consists of low bedrock hills and associated basal slopes, low lying poorly drained alluvial flats and coastal dune systems. The low lying areas are underlain by lower Permian slate, phylite, schistose sandstone and schistose conglomerate and intersected by Quaternary alluvium and estuarine deposits comprising sands, silts and gravels associated with the creek system (Patterson Britton and Partners 2003). The soils materials are characterised by loamy topsoil and light clay subsoil on the hill slopes and crests, with clayey loam or loam topsoil and light to medium clay or silty clay subsoils occurring in the low-lying plains and swamps found between the ridge lines (PPK Environment and Infrastructure Pty Ltd 1998).

2.2 Vegetation

The terrain is characterised by undulating hills with a drainage line running north-south across the Lot. A gully runs east-west at the northern boundary of the Lot. Part of the Lot is subject to the 1:100 year flood event. The northern section of the Lot slopes gently to the south of Lyons Road. To the south, the land rises to a ridge area. From this ridge, the land slopes away to the western and southern boundaries which abut the Bongil Bongil National Park.

To the east, the land slopes down to a low lying swamp forest which is zoned 7(e) Environmental Protection. The swamp occupies approximately one third of the Lot. The Lot is considered highly disturbed and modified as the ridges and slopes have been previously cleared to allow for grazing and horticulture (i.e. banana plantation). The vegetation is predominantly Community 5: Low closed grassland with scattered trees although trees only survive on the creek line. Community 1: Tall open swamp sclerophyll forest (*Eucalyptus robusta*) and Community 3 Tall open dry sclerophyll forest (Mixed Species) remain in the north and east of the study area. Community 2: Tall open/closed swamp sclerophyll forest (*Melaleuca quinquenervia*) is found in the east of the study area (Figure 3 modified from James Warren & Associates 2009). This vegetation community, having high conservation value and subsequent 7(e) zoning, will not be part of the proposed development.

2.3 Land use effects

Approximately two thirds of Lot 112, including the ridges and slopes, has been previously cleared for agricultural purposes and crop cultivation. Clearing, logging and ploughing has occurred repeatedly since European settlement of the area (around 1863) and, coupled with the movement of grazing stock over the Lot, disturbance to the majority of the original ground surface is likely to have occurred. Mechanical disturbance of the ridge top when the south east ridge crest was graded to form a less pronounced slope during vegetation clearing and in the western portion of the site disturbance occurred during the establishment of a borrow pit. The borrow pit disturbance complied with the Coffs Harbour City Council (CHCC) Landform Modification conditions and was approved by the CHCC. Topsoil from the borrow pit was stripped and stockpiled on the east and west sides of the borrow pit. Artefacts were visible in the stock pile and the exposited surface during the 23 January survey. The topsoil was then respread over the borrow pit after underlying material had been removed. As a result of the finds in the borrow pit the Lot was registered on the AHIMS database as PAD # 22-1-0357.

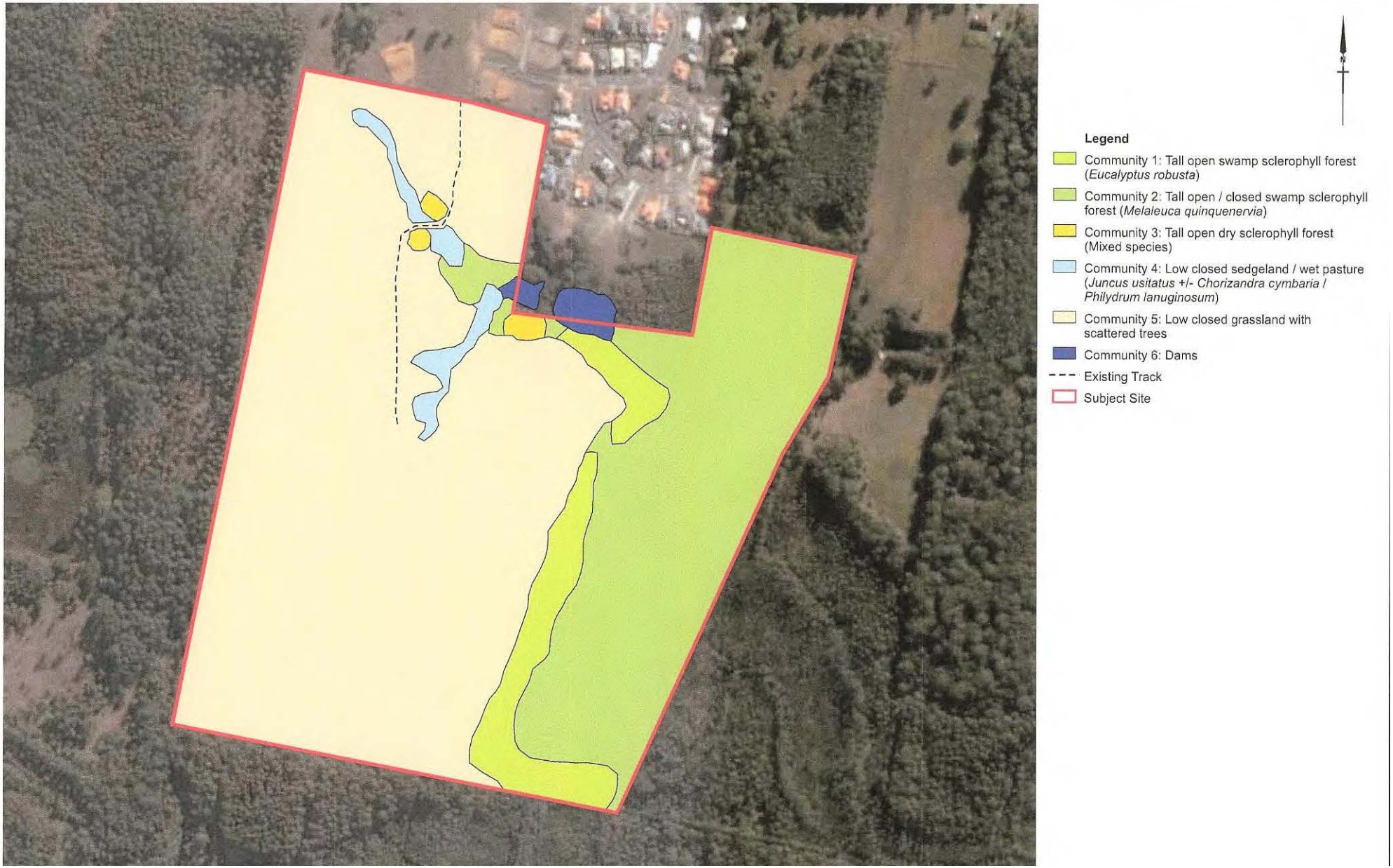

Figure 3 Lot 112 Vegetation communities Source James Warren & Associates (Fig 5) 2009

3 INDIGENOUS HERITAGE CONTEXT

3.1 Background

At the time of first European settlement the Coffs Harbour area was occupied by Gumbaynggir speaking people whose traditional territory extended over a wide area from the Clarence River to at least as far south as the Nambucca (Gumbaynggir Language and Culture Group 1992). The groups shared resources, trading and ceremonial occasions and intermarried. They distinguished themselves from neighbours by their language (MacDonald and Collins 1999:37-38). As McDougall (1900:116) stated 'each tribe kept its own belt of country and separated into small camps and only collected together on special occasions'.

One of the earliest references to local inhabitants was made by Lieutenant Flinders at Yamba in 1799 (Maclean District Historical Society 1980:12). Deputy Surveyor General Perry visited the Clarence River in the steamer King William in 1839 and reported 'a tribe ……. who were hutted in a sort of temporary village at the head of a deep estuary'. He noted carefully formed canoes moored in front of the village. The canoes were made of sheets of string bark gathered and tied at each end (Maclean District Historical Society 1980:24). In the late 1880's, Walter Harvie, one of the early pioneers in the area, witnessed a tribal battle consisting of about 500 Aboriginal men, followed later that night by a corroboree of about 1000 Aboriginal people on the ridges between Bongal and Boambi (sic) Creeks (Raymond 1999).

The margins of the different vegetation complexes across Gumbaynggir country were known to be rich in animal and plant resources some of which were staples allowing large numbers of people to be supported for long periods of time. Base camps were established in areas protected from the elements by dense vegetation (McFarlane 1934-5). During the early contact years Aboriginal occupation was mostly on the coast and along the major river corridors though land use patterns were highly modified as a result of the European settlement of the area. The largest camps are said to have been situated at Bagawa near the confluence of Bucca Bucca Creek and the Orara River (Holder 1984: 20 in Collins 2002) but substantial coastal camps were also located at Moonee and Woolgoolga.

The area around Boambee and Bonville Creeks were rich in Traditional foods and important for hunting trips for wallaby and kangaroo. These hinterland areas, which supported an abundance of resources, were important for both economic subsistence and ceremonial gatherings. Walter Harvie described the creeks as favourite camping grounds and Lambert Waddy (in the Boambee Public School Centenary Book 1902-2002) stated that Aborigines who lived on a ridge just west of the Sawtell Reserve overlooking the creek would drive kangaroos into the creek. In 1920 the construction of a track to the Bonville Reserve unearthed oyster and fish bones with human bone found at depth (Coffs Harbour Advertiser 25 September 1928 and 9 October 1928).

Evidence suggests that groups travelling inland between Moonee Beach and Bucca Bucca Creek used the ridgelines now followed by Bucca Road. The association between low gradient ridgelines and Aboriginal transit routes is likely to have been typical wherever exposed ridgelines support a drier and more open form of forest cover. These defined pathways constituted important features of Aboriginal land use and way of life. Frequent movement along transit lines was well documented. People from Woolgoolga visited the upper Bellinger Valley, and the Macleay and Clarence River people gathered for a tribal conflict with others at Mylestom in the late 1900s (Braithwaite and Beard 1978:82).

Holder (1984) asserted that a seasonal land use pattern was adopted whereby autumn and winter were spent on the coast fishing and in summer the Orara Valley was used for hunting. Visits to the coast were made when the mullet were running in the late autumn. The main winter camps were established on low hills and ridges such as the spur occupied by the Coffs Harbour Gun Club where artefacts were recorded (AHIMS Site #22-1-138).

The Gumbaynggir people suffered a decline in population following European settlement of the area due to the prevalence of disease and the changes that European settlement brought with it. Bush and town camps were however, still occupied in some areas up to the 1960s. Because of this, the Gumbaynggir have maintained an association with the Coffs Harbour area and have had opportunities to pass down traditional knowledge about traditional Aboriginal use of the land in the region.

3.2 Aboriginal resources

The hinterland area of the Coffs Harbour region is known to contain a rich and varied resource base of traditional plant and faunal resources. These resources provided the Gumbaynggir people with abundant food as well as medicinal resources and materials for manufacturing equipment.

Examples of Traditional flora and fauna resources which have been recorded in the study area (Gunninah Environmental Consultants 1997) include;

- Black wattle *[Callicoma serratifolia]*
- Broad-leaved paperbark *(Melaleuca quinquenervia)*
- Swamp mahogany (*Eucalyptus robusta*)
- Mat-rush *(Lomandra longifolia)*
- Bloodwood *(Eucalyptus intermedia)*
- Blady grass *(Imperata cylindrical)*
- Native peach *(Trema aspera)*
- Native cherry *(Exocarpus cupressiformis)*
- Grass tree *(Xanthorrhoea fulva)*
- Eastern grey kangaroo *(Macropus giganteus)*
- Swamp wallaby *(Wallabia bicolour)*
- Common ringtail possum *(Pseudocheirus peregrinus)*
- Common brushtail possum *(Trichosurus vulpecular)*

3.3 DECCW Aboriginal Heritage Information Management System

The Aboriginal Heritage Information Management System) lists thirty-four Aboriginal objects and/or Aboriginal places within a 4 km radius of the study area (search undertaken September 2009). These include middens, open camp sites, isolated stone artefacts, stone artefact scatters and Potential Archaeological Deposits (PADs), (Table 1 and Appendix 1).

Except for the Lyons Road PAD (AHIMS #22-1-0357), none of the registered sites occur within Lot 112. AHIMS site #22-1-0225/0243 and 22-1-0298 (Sewer line scatter) is the closest site to Lot 112 and is located on the adjacent Lot 2 DP1065589 approximately 200 m to the north (Appendix 1).

3.4 Other heritage registers

Searches of the following registers were made:

- Commonwealth and National Heritage Registers (Department of Environment, Water, Heritage and the Arts);
- NSW State Heritage Register;
- Schedule 2 (Heritage Items) of the North Coast Regional Environmental Plan 1988; and
- Schedule 5 (Heritage Items) of the Coffs Harbour Local Environmental Plan 2000.

No Aboriginal sites or places were listed in or close to the study area.

3.5 Native title claims

Searches of the following databases were made for the Coffs Harbour LGA (16th September 2009):

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

No entries for the Coffs Harbour LGA were found.

Table 1. DECCW registered Aboriginal sites within 4 km of the study area

DECCW #	Site Name	Site Type
22-1-0012	Sawtell	Midden
22-1-0013	Bonville Creek	Midden, Burial/s
22-1-0029	Boambee Creek, Sawtell Midden 1	Midden
22-1-0030	Boambee Creek, Sawtell Midden 2	Midden
22-1-0035	Sawtell	Midden
22-1-0036	Bonville Creek	Midden
22-1-0037	Bonville Creek	Midden
22-1-0043	Site 7	Open camp site
22-1-0044	Site 5	Open camp site
22-1-0045	Site 6	Open camp site
22-1-0046	Bonville Creek	Open camp site
22-1-0047	Bonville Station	Open camp site
22-1-0122	Sawtell	Isolated find
22-1-0126	Bonville Creek Artefact Scatter	Open camp site
22-1-0132	Dolmans Point Knapping Site	Artefact scatter (10)
22-1-0213	Bonville Ck Mouth Midden	Midden
22-1-0214	B/Bay – 1	Artefact (1)
22-1-0225	Sawtell Park Estate	Artefact scatter
22-1-0237	BPS02, Bonville PH Upgrade	PAD
22-1-0238	BPS03, Bonville PH Upgrade	PAD
22-1-0239	BPS04, Bonville PH Upgrade	PAD
22-1-0240	BPS05, Bonville PH Upgrade	PAD
22-1-0241	BPS06, Bonville PH Upgrade	PAD
22-1-0242	BPS07, Bonville PH Upgrade	PAD
22-1-0243	Sawtell Park Estate 1	Artefact (1)
22-1-0298	Sawtell Park Estate, Boambee East, NSW-CH-SE-DI Sewer Line	Artefact scatter (29)
22-1-0302	Bonville Borrow Pit 1	PAD
22-1-0303	Bonville Borrow Pit 2	PAD
22-1-0312	LR-1	Artefact scatter (7)
22-1-0313	LR-2	Artefact scatter (4)
22-1-0314	LR-3	Artefact (1)
22-1-0341	South Boambee PAD 1	PAD
22-1-0356	Sawtell Headland 1	Artefact scatter (9)
22-1-0357	Lyons Rd Bonville Site 1	PAD

3.6 Past archaeological surveys in the area

Godwin 1982

In 1982, Godwin undertook a survey in the North Boambee Valley, over an area of approximately 640 hectares and identified three locations containing stone artefacts. These were:

- The 'Drive-In' site, (not registered), was located to the south-west of the Coffs Harbour Drive-In and consisted of a low-density stone artefact scatter, comprised of cores, flakes and choppers struck from river cobbles.
- An isolated stone artefact (not registered) was identified in a ploughed paddock located on low lying flood prone land at the foot of the Roberts Hill ridge. The paddock had been systematically surveyed but further stone artefacts had not been located.
- Two stone artefacts (not registered) were also recorded in a cleared paddock on the lower slopes of a hill.

Godwin's study included consultation with land owners and a local informant indicated that at least one edge ground axe had been found in the vicinity of Roberts Hill. Local Aboriginal groups were also consulted and one group indicated that a resource area was located along Boambee Creek. No other Aboriginal cultural heritage issues were indicated for the study area.

Brayshaw 1994

Brayshaw conducted a survey as part of the Pacific Highway upgrade, from Lyons Road to England Road, in 1994. Artefacts (not registered) were located near the present Lyons Road roundabout and two isolated artefacts (not registered) were located on a spur overlooking a gully draining to Cordwells Creek.

Bonhomme Craib & Associates 2004

In 2004, Bonhomme Craib & Associates prepared a cultural heritage study for the archaeological resources of Lot 1 DP390752 Lyons Road, North Bonville. Lot 1 is on the eastern boundary of the Sawtell Park Estate which adjoins Lot 112. The area had been cleared and consisted of steep slopes and a ridge top. A ground survey was conducted in consultation with the CHLALC and no Aboriginal cultural material was identified during the survey.

Bonhomme Craib & Associates 2005, 2006

Bonhomme Craib & Associates conducted an archaeological assessment of Lot 2 DP1065589 and Lot 3 DP1065589 Sawtell Park Estate in 2005. Lot 2 adjoins the northern boundary of Lot 112 and consisted of cleared slopes and regenerated woodlands. A ground survey was conducted in consultation with the CHLALC and no Aboriginal cultural material was identified during the survey.

The low slope area along the watercourse in Lot 2 and Lot 3 were identified as Potential Archaeological Deposits (PADs) and a program of archaeological testing was recommended based on the concerns of the CHLALC.

Archaeological test excavation was conducted by BCA in the PAD areas under AHIP #2341 in 2006 in conjunction with the CHLALC and the Gumbula Julipi Elders. Thirty test pits were excavated in areas along the watercourse margin on the low slope, mid slope and upper slope contour. Twenty nine (29) Aboriginal objects were identified during the test excavations. Artefacts types included flaked pieces, flakes, a core and a chopper. The findings indicated a very low density artefact scatter on a north facing slope overlooking an ephemeral watercourse. All artefacts were in the upper 20 cm of soil. This type of scatter is probably represents a short term activity area.

Bonhomme Craib & Associates 2008

In 2006, Bonhomme Craib & Associates, in conjunction with the CHLALC, undertook cultural heritage investigations on Lot 2 DP1082747 North Boambee Road, North Boambee (Bonhomme Craib & Associates 2007). North Boambee lies approximately 10 km to the north of Bonville. No surface sites or features of Aboriginal or historical cultural heritage were identified during the investigations.

During the survey of Lot 2, the CHLALC identified the low ridge on the southern boundary of the study area as a Potential Archaeological Deposit. A permit for subsurface testing was granted by the DECCW (AHIP #2790) and testing commenced in March 2008.

Twenty test pits were excavated along the ridge line and a total of twenty-three stone artefacts, including broken flakes and a core, were found. This constituted a low-density artefact scatter representative of a limited range and scheduling of Aboriginal activities in the area, probably resulting from short-term visits and limited activities.

Collins 2008

Collins conducted a cultural heritage assessment of the Lakes Estate residential development in the North Boambee Valley in 2008. One small scatter of eleven (11) Aboriginal stone artefacts was found and four PADs were identified during the survey. Two of the PADs (LE- PAD 1 and LE- PAD 2) were recommended for archaeological testing with the remaining two PADs (LE- PAD 3 and LE-PAD 4) recommended for anthropological investigation.

Test excavation of LE-PAD 1 and LE- PAD2 was undertaken in 2008. Twenty four stone artefacts were identified in PAD 1 and sixteen stone artefacts were identified in PAD 2, during excavation. Artefacts consisted of cores, flakes and flaked pieces. The artefacts represent a low density scatter that is believed to be items discarded during transit along the ridge lines in the study area.

3.7 Archaeological potential of the study area

Potential site types
Information from Stakeholder consultation, the literature review and survey of the study area indicate a potential for Aboriginal sites to occur within the study area. Based on other site types registered in the area, the following site types would be the most likely to occur in the study area:

Isolated stone artefacts
Isolated stone artefacts can occur anywhere. They may represent the loss or discard of an artefact or the remnant of a low density, dispersed artefact scatter.

Stone artefact scatters
These may occur as open, surface scatters or stratified deposits. An artefact scatter may represent a camp site and/or a specialised short-term activity area where manufacturing of stone occurred during a hunting trip or whilst in transit from one area to another. Stone artefact scatters have been found at the location of the present Lyons Road roundabout and on the adjacent Lot 2 immediately to the north of Lot 112 (AHIMS site #22-1-0225).

Scarred trees
These are trees that have evidence of purposeful removal of bark. Material items were made from the bark and include canoes, shields, housing and bowls.

Predictive site location models
The general predictive model for the location of Aboriginal sites is based on the local landforms, the disturbance and/or impact history of the Lot, and known Aboriginal sites in the area.

In the study area, a variety of Traditional resources – riverine, wetland and forest margins - would have been available. In these environments the most common Aboriginal sites likely to occur are isolated stone artefacts or stone artefact scatters. It is predicted that stone artefacts manufactured from locally available material may include cores, flakes and flaked pieces. 'Manuports' in the form of pebbles derived from the coastline or stream areas, may also have been transported to the Lot and may occur as whole pebbles or split pebbles.

If the area was used by small, mobile groups, for example hunting parties or groups in transit from one camp to another, the sites would be characterised by open stone artefact scatters with low artefact densities. Evidence of use of the ridges as transit areas would also be found as isolated artefacts and low-density artefact scatters. It is likely that large camps were located on the coast and on the estuaries and as such, the scatters found on the slopes of the hinterland will be associated more with short-term specific activities such as resource gathering.

Little archaeological material is expected in the low-lying flood prone areas of the study area. Similarly, steep slopes were not considered ideal camping or general activity locations.

The areas where sub-surface isolated artefacts and/or low-density scatters have been found in other studies and therefore might be expected to occur in the study area are on the crest of the hills or the lower slopes above the wetland areas.

Clearing, logging and ploughing of the Lot has occurred repeatedly since settlement. The mature forests were cleared to create grazing land and later, for horticulture. Much of the existing forest on the Lot is regrowth with some remnant woodland located in the northern portion of the Lot (Gunninah Environmental Consultants 1997). The survey, (see Section 5), located no scarred trees and given the extent of past clearing on the Lot it is unlikely that scarred trees would occur in the swamp regrowth areas.

4 NON-INDIGENOUS HERITAGE CONTEXT

4.1 Historical background

Captain John Korff first used the area now known as Coffs Harbour port around 1850 to shelter from bad weather. As such, he is regarded as the first European to discover the Coffs Harbour area, although Lieutenant James Cook did sail past and identify the port as early as 1770.

Korff realised the potential of the creek, which he named Korff's Creek, which at the time was wide and deep and navigable for a long distance. He used the bay as a refuge for his ships during bad weather and it became known as Korff's Harbour. It is reported that he began to cut and export timber, such as red cedar, to Sydney and other markets. The lack of a major river meant that further European settlement of the Coffs Harbour area was slow and although a reserve for a village was set aside in 1861, John Korff largely maintained the harbour and used it as his own up until around 1870. At some point, the area became known as Coffs Harbour, perhaps as a result of a printing error in a government gazette.

Timber-cutters began to arrive in the district from about 1863[1] and Walter Harvie is widely accepted as having been the first European settler in the immediate Coffs Harbour area. He established a timber camp and began to cut cedar from the Red Hill area. Getting the timber to the Sydney markets was difficult and dangerous. The timber was floated downstream and loaded onto wagons to be dragged along the beach by teams of bullocks. It was then unloaded onto the beach and the outgoing tide assisted men in boats to float the logs out into the deeper water where the ships waited to be loaded. The men would manoeuvre the logs into position so the ship's cranes could lift the logs onto the boats.

Land around Bonville was settled around 1863 although transient timber-cutters had been in the area in the 1830s and 1840s. The name Bonville is thought to be a corruption of Bongil Bongil which means a place where one stayed a long time. William Bayldon, one of the first selectors in the area first called the place Bonville in 1872.

More selectors in the Bonville-Boambee area followed, including Matt Singleton who selected Crossmaglen, Mr Reedy who selected Bonville Creek, and Mr Archer who selected Pine Creek, August Schneider who selected Englands Road and established a sugar mill and Mr Keiler who selected at Boambee and grew grapes for wine production.

The early 1880s saw further settlers arrive in the district and take up gazetted land in Coffs Harbour. In 1881, gold was discovered in the Orara Valley and a further influx of people arrived in the district. By 1882, James Newport had arrived in Coffs Harbour. He selected near North Boambee and established the first sugar mill to cater to the sugar cane plantations which were thriving in the area. Much of the inland rainforest had been extensively cleared by this time and agriculture was becoming the predominant industry.

The construction of a jetty in 1890 facilitated the export of timber from the district and, through employment, boosted the economic growth in the area. Permanent saw mills were established and trams were used to transport the timber. The North Coast Railway, which diminished the importance of ships for transport of goods to markets, was completed in 1915.

By 1928, Coffs Harbour was hit by the Depression. The timber industry declined and banana growing became an important industry. By 1930, approximately 750 hectares of land in the area were under banana cultivation.[2]

Land at Sawtell was subdivided in 1925 and the town expanded until the early 1970s when the residential precincts of Toormina and Bayldon were developed. The Shire of Coffs Harbour was proclaimed in 1956 with boundaries extending from Pine Creek to Arrawarra and west to Lowanna. In 1987, Coffs Harbour was proclaimed a city.

[1] Coffs Harbour Shire Council, 1987 *Heritage Study, Coffs Harbour Shire*. Coffs Harbour Shire Council, Coffs Harbour, NSW, p. 6.
[2] *Ibid.*, p. 15.

4.2 Heritage registers

Searches of the following registers were made:

- Australian Heritage Database;
- NSW State Heritage Register;
- National Trust of Australia (NSW) Register;
- Schedule 2 (Heritage Items) of the North Coast Regional Environmental Plan 1988; and
- Schedule 5 (Heritage Items) of the Coffs Harbour Local Environmental Plan 2000.

No historical sites or items were listed in or close to the study area.

4.3 Heritage studies

In 1986, Coffs Harbour City Council conducted a shire-wide Non-Indigenous heritage study.

The purpose of the study was to provide information that could be used in preparation of planning strategies for the Council as well as a means of providing heritage information to the general public. The study aimed to identify the architectural and environmental heritage significance of buildings and places within the Council area, evaluate the effectiveness of planning policies for environmental heritage conservation and recommend conservation strategies for use in planning instruments.[3]

The study was based on a thematic history of the development of the area and considered;

- early settlement of the area (1860 – 1900);
- early local industry (timber cutting, agriculture, mining, fishing, dairying);
- economic development of the area (1900 – 1950);
- infrastructure development (the jetty, railway, roads);
- tourism; and
- urban expansion.

Seven environmental items of regional or state significance and twenty-six items of local heritage significance were identified by the study. Two items of local heritage significance occur in the Bonville area. These are the Dairy Shed on the Pacific Highway and Bonville and Scrub Creek adjoining Bonville Beach. These items are not in the vicinity of the proposed development.

A further heritage study was conducted in 1997-98 by EJE Town Planning[4] for the Coffs Harbour City Council to assist the Council with management of the cultural heritage values of the area particularly with regard to the preparation of its Local Environment Plan 2000.

Forty-six heritage items of local, regional and/or state significance were identified in the study. These items are not in the vicinity of the proposed development. No items of Non Indigenous heritage significance were located during the survey or the test excavations conducted in the dev elopement area.

4.4 Survey and test excavation results for Non Indigenous heritage

No items of Non Indigenous heritage significance were located during the background searches, survey or the test excavations conducted for the assessment of Lot 112 DP 1073791.

[3] Coffs Harbour Shire Council, *Heritage Study,* p. 2.
[4] EJE Town Planning, 1997 *Coffs Harbour Heritage Study: Final Report*. A report to the Coffs Harbour City Council and EJE Town Planning, 1998 *Coffs Harbour Heritage Study – Stage 2: Final Report*. A report to the Coffs Harbour City Council.

5 CONSULTATION

To meet the Director-General requirements for projects in relation to Part 3A (EP&A Act) approvals, the '*Guidelines for Aboriginal Cultural Heritage Impact Assessment and Community Consultation'* (DECCW 2005) stipulate that the Aboriginal heritage assessment must establish the 'Cultural Landscape' of the study area. The 'Cultural Landscape' information includes the physical setting (landscape), the history of peoples living on that land (social/cultural information) and the material evidence (archaeological information) (DECCW 2005). The social and cultural information is gathered through a process of community consultation and documentation in accordance with the '*Interim Community Consultation Requirements for Applicants*' (DECCW 2004). These consultation requirements outline a number of steps to ensure that the Aboriginal community has the opportunity to participate in the assessment process through comment, the contribution of cultural knowledge to inform the assessment and consideration of the values and concerns that may be expressed by the community. See Appendix 2 for details of the consultation and supporting documentation.

Consultation background

In 2004 the CHLALC and BCA undertook a survey of Lot 2 Lyons Road. This Lot is immediately north of Lot 112. At that time BCA included Lot 112 in the survey. Subsequently Lot 112 was excluded from the study because the development of that Lot was not imminent. This advice was relayed to the CHLALC during on-going consultation for the proposed development of Lot 2 Lyons Road. A cultural heritage assessment report for Lot 2 was submitted to the registered stakeholders for the project. Subsequently test excavation, in conjunction with the CHLALC, was conducted on Lot 2 (not the subject of this report) under a Section 87 permit.

Notification and registration of interests (2008-2009)

Utila registered the development as a Part 3A project and consultation in accordance with the DECCW requirements was initiated. The following Aboriginal organisations were mailed notification that Lot 112 was proposed for developed as an urban residential subdivision and invited to register an interest in the project:

- The Coffs Harbour Local Aboriginal Land Council
- The Bagawa Birra Murri Aboriginal Corporation
- Gumbular-Julipi Elders Council
- Gumbaynggirr Warrior Elders of the Nambucca River
- Gumbaynggirr Native Title Group and Gumbaynggirr Nation
- Gumbaynggirr Elders
- Mudjay Elders
- Kulai Pre School Aboriginal Corporation
- Stuarts Island Local Aboriginal Land Council
- Garby Elders Group
- Office of the Registrar
- Native Title Services
- Coffs Harbour City Council
- Department of Environment Climate Change and Water (Coffs Harbour)
- Department of Environment Climate Change and Water (Sydney)

A newspaper notice was published in the Coffs Coast Advocate (Weekend Edition) on the 13th December 2008. The closing date for registration of interest was the 5th January 2009.

Two Aboriginal organisations responded and were registered as stakeholders:
- The Coffs Harbour Local Aboriginal Land Council; and
- The Bagawa Birra Murri Aboriginal Corporation.

DECCW also responded and provided a list of Aboriginal organisations that should be contacted as part of the consultation; however these organisations had already been sent a letter of invitation.

Preparation for the test excavation design

A second survey of the Lot was completed on the 23rd January 2009, in conjunction with the CHLALC (BCA 2009). The CHLALC indicated that a subsurface testing program should be undertaken and indicated that they would continue their involvement with the assessment through participation in the testing.

In accordance with the DECCW requirements, a copy of the draft Cultural Heritage Survey Report for Lot 112, Lyons Road Bonville, and the Research Design for Testing of Potential Archaeological Deposits was mailed to the registered stakeholders with an invitation to comment on any issues or areas of cultural heritage significance that may affect, inform or refine the proposed methodology.

A further request was also made at this time to the Bagawa Birra Murri Aboriginal Corporation asking if they wished to be involved with the assessment. No further response was received from this organisation.

No comments on the draft Cultural Heritage Survey Report or the research design were made by the CHLALC or received from Bagawa Birra Murri Aboriginal Corporation. The report and the research design were deemed to have been accepted by the stakeholders and finalised.

Drafting, review and finalisation of the Cultural Heritage Assessment Report

A meeting was arranged with the CHLALC to discuss the research design for testing of the PADs and to obtain a Care Agreement for Aboriginal objects.

Test excavation involvement

Test excavations and ground surface inspections were undertaken from the 2nd November 2009 to the 20th November 2009 with the assistance of a team of CHLALC senior sites officers and CHLALC experienced labourers. (See Section 6 Field investigations for details the survey and test excavation results).

Drafting of Part 3A Assessment report

The draft Part 3A assessment was prepared. This report includes the results of the searches, surveys and test excavation an assessment of significance of the material. A draft Management Plan was prepared. In accordance with the DECCW requirements, a copy of the draft Cultural Heritage Part 3A Assessment Report for Lot 112, Lyons Road Bonville, the registered stakeholders were notified that the report was available and invited to comment.

A letter documenting the status of the project and the invitation to stakeholders to comment on the draft report was sent to the Department of Planning (24/3/10). DECCW was contacted by letter (24/3/2010) for confirmation that the relocation of the top soil and re deposition of excavated artefacts did not require a permit.

The CHLALC was contacted to arrange return of the excavated material under the conditions of the Care and Control Permit. Artefacts were returned to the CHLALC office (4/4/10 see Appendix 3).

Finalisation of the Part 3A Assessment

The CHLALC provided a sign off letter on 12/5/10. They requested clarification of Recommendation 1 regarding removal of top soil. Clarification was sent 13/5/10 and Recommendation 1 was amended to reflect the extra detail required. No further issues were raised.

A letter stating that the final report was available on request was mailed 17/5/10.

6 FIELD INVESTIGATIONS

6.1 Survey

A ground survey of Lot 112 was conducted on the 23rd January 2009 in consultation with two representatives from the Coffs Harbour & District Local Aboriginal Land Council (CHLALC). The survey involved a surface inspection of the area with examination of all exposed areas with high visibility such as the borrow pit, vehicle tracks, cattle tracks and other areas of mechanical or natural disturbance (see Appendix 5).

6.1.1 Survey results

Indigenous sites
Three flakes were identified at the south end of the borrow pit, and a split pebble chopper was found in a small disturbed area (2m x 2m) on the south eastern ridge. Five Potential Archaeological Deposits (PADs 1 – 5) were recorded during the field survey. The discovery of artefacts on the ridge lines indicates that these areas have potential for further artefacts to be present. The Coffs Harbour Local Land Council was concerned that subsurface testing should be undertaken on the ridge lines as well as the area bordering the watercourse. The CHLALC representative indicated suitable transects within the PAD areas to ensure adequate testing of the areas of concern.

Historical sites
No historical sites were identified during the survey. None of the background research or various register searches identified any historical items in or near the study area.

6.1.2 Aboriginal cultural significance

The CHLALC have identified the study area as having Aboriginal cultural heritage values associated with the use of the area for Traditional resource procurement. They have indicated that in their opinion an understanding of the cultural/social significance and the scientific/archaeological significance of the identified Aboriginal cultural heritage values can be adequately address through a program of archaeological testing along the ridge areas (PADs).

6.1.3 AHIMS database

The PAD was registered on the DECCW AHIMS database as 22-1-0357.

6.1.4 Survey recommendations

As the proposed development will impact the entire Lot, (with the exception of the 7(e) Environmental Protection zone), the following recommendations were made to address the impact of the proposed development on Aboriginal objects and to afford appropriate protection of Aboriginal cultural heritage.

Recommendation 1: Archaeological test excavation of the PAD areas identified by the CHLALC during the survey is recommended in consultation with the registered stakeholders.

Recommendation 2: All contractors should be made aware that under Part 6 Section 90 of the NPWS Act a person who knowingly destroys, defaces or damages or knowingly causes or permits the destruction or defacement of or damage to, an Aboriginal object or Aboriginal place without first obtaining the written consent of the Director-General, is guilty of an offence against the NPWS Act.

6.2 Test excavation PAD 22-1-0357

6.2.1 Justification and research design

The research value of 'management archaeology' in small-scale residential developments is limited in terms of the kinds of questions that can reasonably be addressed. Aboriginal communities also have a key role in identifying research issues and their concerns should be built into the research design (Aboriginal Cultural Heritage Standards & Guidelines Kit 1997).

The test excavation aimed to:

- Determine if evidence of Aboriginal occupation of the study area exists in PAD areas and would therefore be affected by the proposed development;
- Characterise the site type of the deposit, i.e. low-density stone artefact scatter, stratified deposits, isolated artefact etc;
- Characterise the nature of the archaeological assemblage, i.e. tools, cores, flakes, faunal material, etc;
- Provide sufficient information to inform the management recommendation with regard to the protection of Aboriginal objects which may be present on the Lot and any mitigation measures which may need to be implemented i.e. salvage, monitoring, etc;
- Ensure that the Proponent can meet the Director-Generals Requirements for Heritage and Archaeology under Part 3A of the *Environmental Planning and Assessment Act 1979*.

6.2.2 Transect identification

Five transects were initially proposed for archaeological testing (Figure 4). The CHLALC representative had identified and walked the five transects and stated that a spacing of 10 m along each transect was adequate for testing purposes. The archaeologist agreed but indicated that field results may require a closer spacing at particular locations if material was identified. The transects and the placement of test pits were marked with pegs by a surveyor prior to the commencement of excavation. A plan of the test pit areas was also produced prior to excavation and made available to the stakeholders.

6.2.3 Care and control of cultural objects

Issues regarding the care and control of any Aboriginal objects recovered during the course of the excavation are addressed through a Care and Control of Cultural Objects permit held by the CHLALC (Appendix 3).

6.2.4 General excavation methodology

Mechanical excavation is a cost effective way of testing for archaeological deposit where stone artefacts are the expected deposit, particularly where small-scale development is concerned. Other archaeological test excavations in the adjacent area conducted by BCA have indicated that mechanical archaeological techniques are suitable for this type of test excavation. Mechanical excavation of test pits, when combined with sieving of the exposed material, has been shown to result in retrieval of material with little loss of assemblage information (Aboriginal Cultural Heritage Standards & Guidelines Kit 1997).

A Case CX31B excavator with a 1 meter wide flat edge bucket was used to excavate the topsoil from 1 m x 1.5 m test pits. The pit size reflects the width of the excavator's flat edge bucket (1 m) and the length of the scrape that provides adequate room for the excavator bucket to be manipulated cleanly (1.5 m). This method was endorsed by the stakeholders. The sieving system is a mechanical sieve, mounted on a 6 m x 4 m box trailer with a 240 volt generator capable of vibrating the screen without damaging artefacts. The sieve is equipped with a 3.5 mm gauge screen. BCA excavated Lot 2 DP1065589 immediately to the north of Lot 112 using mechanical excavation methods and sieving and retrieved artefacts as small as 1cm in length suggesting this method has a good artefact recovery rate. After initial motorised sieving, the generator was halted and the remaining material was pushed through the sieve by up to six (6) people placed around the sieve. This method resulted in a good retrieval of even small artefacts.

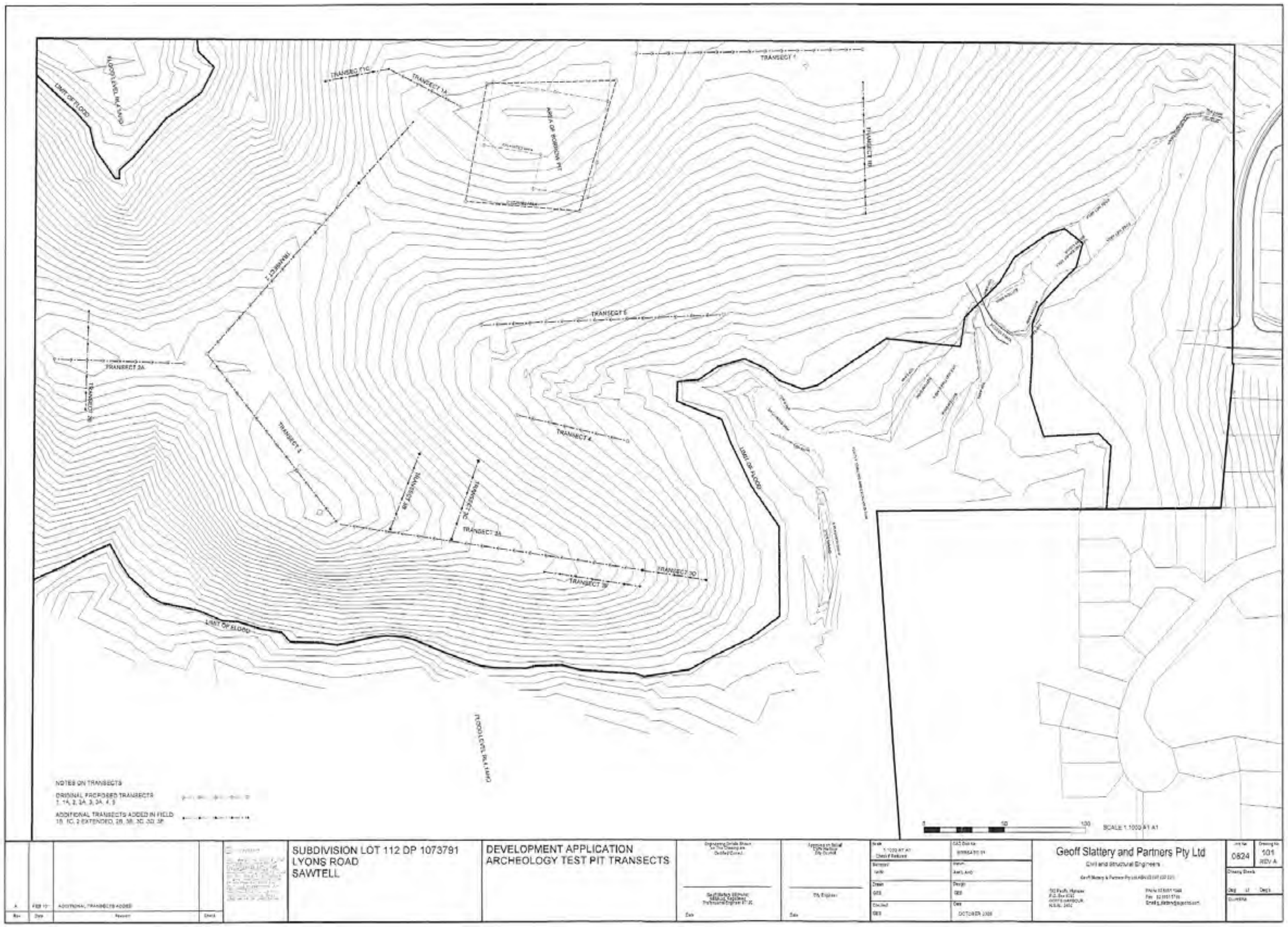

Figure 4: Map of Lot 112 showing placement of transects across the study area.

The procedure for excavation of each test pit was discussed with the CHLALC representatives and agreement as to size, spacing and location was reached for each area prior to work commencing. A briefing was given each day to summarise the work completed the previous day, the results and the anticipated work programme for the day.

All recording and excavation techniques employed were discussed with the CHLALC representatives and an agreement on how to proceed was made prior to any activity being undertaken. Each of the representatives was given the opportunity to view the maps and field recordings. All strategies for testing the distribution of artefacts were discussed with the group.

Daily tasks, excavation progress, concerns, issues, significance of the area, excavation results and recommendations for the management of Aboriginal cultural heritage on the Lot were discussed with CHLALC representatives during and at the conclusion of the excavation work. An on site briefing was held with the CEO CHLALC on 13/11/09 to discuss progress to date and work still to be completed. A final debriefing with the team was held on 20/11/09 to discuss the results and recommendations for mitigation. Each member of the team signed off on the debriefing and a copy of the notes was sent by mail to the CHLALC office for their records.

6.2.5 Transect testing methodology

Testing proceeded in two stages

- Stage 1 involved excavation along the 5 transects (Figure 4).
- Stage 2 involved extension of transects or the establishment of new transects to test high concentrations or particular landforms.

Excavation consisted of scraping the topsoil in 10 cm spits to a depth of between 10-30 cm or until a sterile layer was encountered. Pit size was approximately 1 m x 1.5 m (one and a half square metres). Each scrape was dry sieved through a mechanical sieve and the sieved material was examined for Aboriginal cultural material. The artefacts recovered were placed in a labelled plastic snap lock bag for later examination. When the collection of the sieved material was completed, the test pit was backfilled with the sieved material before the next test pit was opened.

Counts of stone material recovered from each test pit were recorded along the transect plan. These counts indicated where high concentrations of stone were located. Such areas were then investigated by the placement of additional transects around the concentration to attempt to define the limits of the area.

The landform features discussed are shown in the profile below.

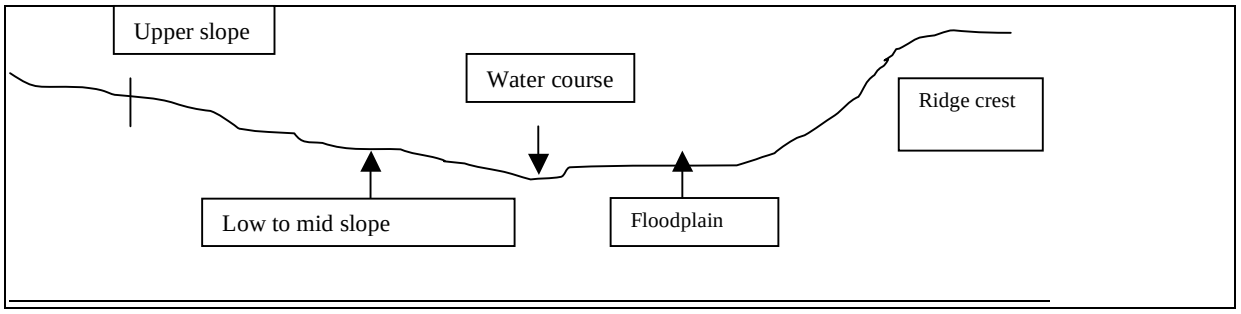

Figure 5 Profile across study area (not to scale). View south

6.2.6 PAD description

The PAD transects (1-5) which were to be tested had been walked and recorded by the archaeologist and the CHLALC representatives during the survey. The transects were pegged by a surveyor prior to excavation taking place. Coloured wooden pegs set 10m apart were established along all transects.

After excavation began several extra transects were established to investigate concentrations found or to identify the boundaries of the concentrations. These were along Transect 1, 2a and 3a.

Transect 1
Landform: Ridge crest
Disturbance: High Presence of borrow pit

Transect 1 runs north-south along the western most ridge line in the Lot, following the boundary fence between the study area and the Bongil Bongil National Park (Figure 6). The ridge is thickly grassed and surface visibility was restricted to the existing cattle track. The borrow pit occurs toward the southern end of the Transect. Stone artefacts were identified by the CHLALC representatives at the southern end of the borrow pit.

Transect 1a

Transect 1a runs in a south-westerly direction along the spur from the southern end of the borrow pit to a point near the boundary fence between the study area and the Bongil Bongil National Park (Figure 7). The spur is thickly grassed and offered no surface visibility. The borrow pit occurs at the northern end of the Transect. Stone artefacts were identified by the CHLALC representatives at the southern end of the borrow pit so Transect 1a was established to identify the artefact distribution. .

Transect 1b
Landform: upper slope (north)
Disturbance: high. Presence of access track to borrow pit
Transect 1b ran east west down slope from the northern end of transect 1.The transect was established to investigate the east west trending knoll and upper slope.

Figure 6 View looking north along Transect 1.

Figure 7: View looking south across borrow pit topsoil stockpile towards Transect 1a

Transect 1c
Landform upper slope (south)
Disturbance: High tree clearing
Transect 1c was established at the southern end of 1a as an extension to investigate the upper slope to the south. The presence of artefacts at the southern end of the borrow pit suggested that the possibility of artefacts occurring down slope from the ridge was high.

Transect 2
Landform: upper slope and saddle
Disturbance: High Previous tree clearing
Transect 2 runs in a north- westerly direction from a point on top of the ridgeline towards the southern end of the borrow pit (Figure 8). The ridge is thickly grassed and offered no surface visibility. The ridge has a saddle towards the middle of the transect.

Transect 2a
Landform: Ridge crest
Moderate: Vegetation clearing and boundary access track
Transect 2a runs in a north-south direction along the spur from the start of transect 2 to the southern boundary fence line of the study area (Figure 8). The southern end of the transect (on the boundary fence) is the northern extension of a ridge which extends south into the forest and is less than 500m from a lagoon down slope.

Figure 8: View looking south-east. Tr2 is in the centre of the picture,

Figure 9: View looking south-east across the Lot to transect 3 and 3a.

Transect 2b
Landform: Ridge crest
Transect 2b was established at test pit 7 on Transect 2a. Artefact concentrations were high in TP 7 and the east and west extent of the concentration was explored at this point.

Transect 3
Landform: Ridge crest
Disturbance high: Activities possibly associated with access tracks for plantation and construction of sheds Vegetation clearing and soil removal
Transect 3 runs in a north-easterly direction from the start of Transect 2, along the south- eastern ridge line in the in the study area, to join Transect 3a at the point where the ridge line begins to sweep around to run north-south (Figure 9). One split pebble chopper was identified on Transect 3 by the CHLALC representative in a small exposed area. The remainder of the ridge is thickly grassed and offered no surface visibility.

Transect 3a
Landform: Ridge crest
Disturbance Moderate: Vegetation clearing
Transect 3a runs in a north-south direction along the eastern most ridge line in the study area, from the end of Transect 3 to the end of the ridge line (Figure 10). This ridge line is close to the wetland area in the eastern portion of the study area. The ridge is thickly grassed and offered no surface visibility.

Figure 10: View looking east across the Lot to the eastern ridgeline to Tr 3a.

Transect 3b
Landform upper slope (west)
Disturbance Moderate: Vegetation clearing
Transect 3b was located 40m north along Transect 3A on the west side. The transect began at an identified concentration on Tr 3a and explored the down slope extent of that concentration.

Transect 3c
Landform upper slope (west)
Disturbance Moderate: Vegetation clearing
Transect 3c was located along Transect 3A on the west side. The transect explored the down slope extent of the artefact material on the ridge.

Transect 3d
Landform upper slope (north)
Disturbance Moderate: Vegetation clearing
Transect 3c was located at the north end of Transect 3a to continue the investigation of the knoll and down slope area overlooking the wetland.

Transect 3e
Landform: Ridge crest
Disturbance Moderate: Vegetation clearing
Transect 3e was placed 10m east o the end of Tr 3a and ran south. This transect was placed on the edge of the flat ridge area and overlooked the eastern wetland.

Transect 4
Landform: Low slope
Disturbance Moderate: Vegetation clearing
Transect 4 runs in a north-south direction along the valley flat which sits on the lower western side of Transect 3a ridge line (Figure 11). The Transect follows the low slope immediately above the watercourse. It is thickly grassed with a few remnant trees and offered no surface visibility. The small watercourse drains north into the wetland/swamp area in the north-eastern portion of the Lot.

Figure 11: View looking south along Transect 4.

Transect 5
Landform: Low slope
Disturbance Moderate: Vegetation clearing and north south access track
Transect 5 runs in a north-south direction along the valley flat which sits on the western side of the north draining watercourse. The Transect follows the low slope immediately above the watercourse. It is thickly grassed with a few remnant trees on the margin of the watercourse. The valley flat offered no surface visibility.

6.2.7. Test excavation results

The landform types investigated during the subsurface testing included the low slope above the water course, mid to upper slope and ridge crest, with varying degrees of post European disturbance. One hundred and forty four test pits were excavated (totalling 64.8 cu m – 216 sq m)) across the 15 main transects and the extensions. The test pits were placed at 10 m intervals along 1400 linear metres across the site (Table 2). Four test pits were established around 2A -7 to investigate a concentration of artefacts.

A total of 15 transects were excavated. Fifty three percent of the test pits were placed along the ridge crest, 31% on the upper slopes and 16% along the lower slopes facing the watercourse which trends north to the wetland (Table 3).

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As a result of the initial transect excavation results (Tr 1-5) additional transects were placed at Transect 1b, 1c, 2b, 3b, c, d, e, Transect 2 was extended 50 m to the north west and Transect 2b was investigated at 5 m intervals north south east and west around a high concentration at Test Pit 2a -7. Inspections of the borrow pit surface located a further 40 artefacts and a general surface collection across the site located a further 55 artefacts.

Table 2. Test pit length, number of test pits and landforms

Transect	Length	No of test pits	Landform	Type of prior Disturbance
1	140	14	ridge	Cattle yards, tracks, tree removal, borrow pit
a	60	6	ridge	cattle tracks, tree removal
b	80	8	upper slope	access track for borrow pit, tree removal fencing
c	40	4	upper slope	tree removal
2	190	19	upper slope and saddles	cattle tracks, tree removal, introduced fill
a	90	9	ridge	tree removal and burning , introduced fill,
2a-7 extension		4		
b	60	6	ridge	tree removal
3	120	12	ridge	tree removal,, introduced fill
a	190	20	ridge	tree removal
b	50	5	upper slope	tree removal
c	50	5	upper slope	tree removal
d	40	3	ridge	tree removal
e	60	6	ridge	tree removal
4	70	8	lower slope	farm track construction, tree removal
5	160	15	lower slope	Tree removal.

Table 3. Percentage of test pits across landforms.

Landform	# of TP	%
Ridge	77	53
Upper slope	44	31
Lower slope	23	16

The ridges and slopes had a shallow soil characterised by a brown silty loam over light clay loam to medium clay. The artefacts generally occurred in greatest number between 0 -20 cm depth. The typical soil profile was a brown silty loam over light clay loam to medium clay.

Artefact inventory

After close examination of all stone material a total of 1328 stone artefacts displaying diagnostic features typical of purposeful modification or use were recorded. A total of 913 artefacts were recorded along the transects and within the extension at Tr 2a-7 a further 320 artefacts were excavated (Table 4). Appendix 4 provides an inventory of recorded artefacts.

Table 4. Artefact counts across all collection areas

Area	Artefact Total
Surface collection	55
Borrow pit collection	40
Transects (1-15)	913
Extension 2a-7	320
Total	1328

Table 5. Artefact density/cu/m

Transect	Artefacts (n)	cu/m	Artefacts/ cu/m	Landform
1	48	6.3	8	ridge
a	72	2.7	26	ridge
b	19	3.6	5	upper slope
c	21	1.8	12	upper slope
2	105	8.5	12	upper slope and saddles
a	225	4.0	56	ridge
2a-7 extension	313 7	1.8 .15	173 6	d abandoned
b	27	2.7	10	ridge
3	127	5.4	24	ridge
a	149	9	17	ridge
b	24	2.3	10	upper slope
c	24	2.3	10	upper slope
d	15	1.4	11	ridge
e	44	2.7	16	ridge
4	8	3.6	2	lower slope
5	5	6.8	.7	lower slope

All items were examined in laboratory conditions for evidence of diagnostic features. The unmodified pebbles were considered manuports as they did not originate within the Lot but rather had been collected and brought to the site and were strongly associated with artefacts in controlled excavations. Pebbles similar to these unmodified pebbles were fractured for artefact manufacture. Artefact analysis was limited to type, raw material, and size range. Artefacts were recorded according to raw material (general field description only) as coarse grained or fine grain siliceous stone. A general size class was determined for each artefact.

The artefacts were examined to provide an overview of the following

- artefact types
- raw material
- size range of artefacts
- variations in types across the site

Artefact types

During tool manufacture there are a number of forms that can result from the manufacturing process. Flakes, cores, flaked pieces and broken flakes are some examples.

Use wear and retouch are evidence of purposeful modification of tools resulting from use or maintenance. Use wear can be difficult to identify unless it is pronounced and other types of non cultural edge damage can be mistaken for use wear. To avoid over identifying tools with use wear and inflating the artefact counts only flakes with patterned edge damage such as regular flaking along one edge but not others were considered as tools.

Tools are those pieces that have been modified either by use or by reduction into patterned forms such as backed blades, scrapers and adzes. Debitage is the non-functional by products of the stone artefact manufacturing process. It usually comprises discarded flaked stone material, often shooing no evidence of flaking but associated with the flaking operation. Debitage pieces are categorised into one of four morphological types: complete flake, broken flakes, flaked pieces and split pebbles.

Complete flakes are those that possess platforms indicating the point of impact and a termination indicating an unbroken flake, such as a feather termination or a hinge. Flaked pieces are those pieces that lack platforms and for which dorsal of ventral surfaces cannot be determined. This material is usually block or angular. A core is a slab of stone from which flakes have been removed.

A core tool is a core with evidence of trimming and/or use wear indicating its use as an implement.

Determination of artefact types was based on the flow chart illustrated in Figure 12.

Table 6. Artefact types and class

Artefact type	Abbreviation	Class
Chopper	S/C	Tool
complete flake	cf	debitage
Broken flake	bf	debitage
flaked piece	fp	debitage
flake tool use wear	FTU1	tool
single platform core	spc	core
multiple platform core	mpc	core
Hammerstone	hs	tool
Backed blade	bb	tool
split pebbles	sp	debitage

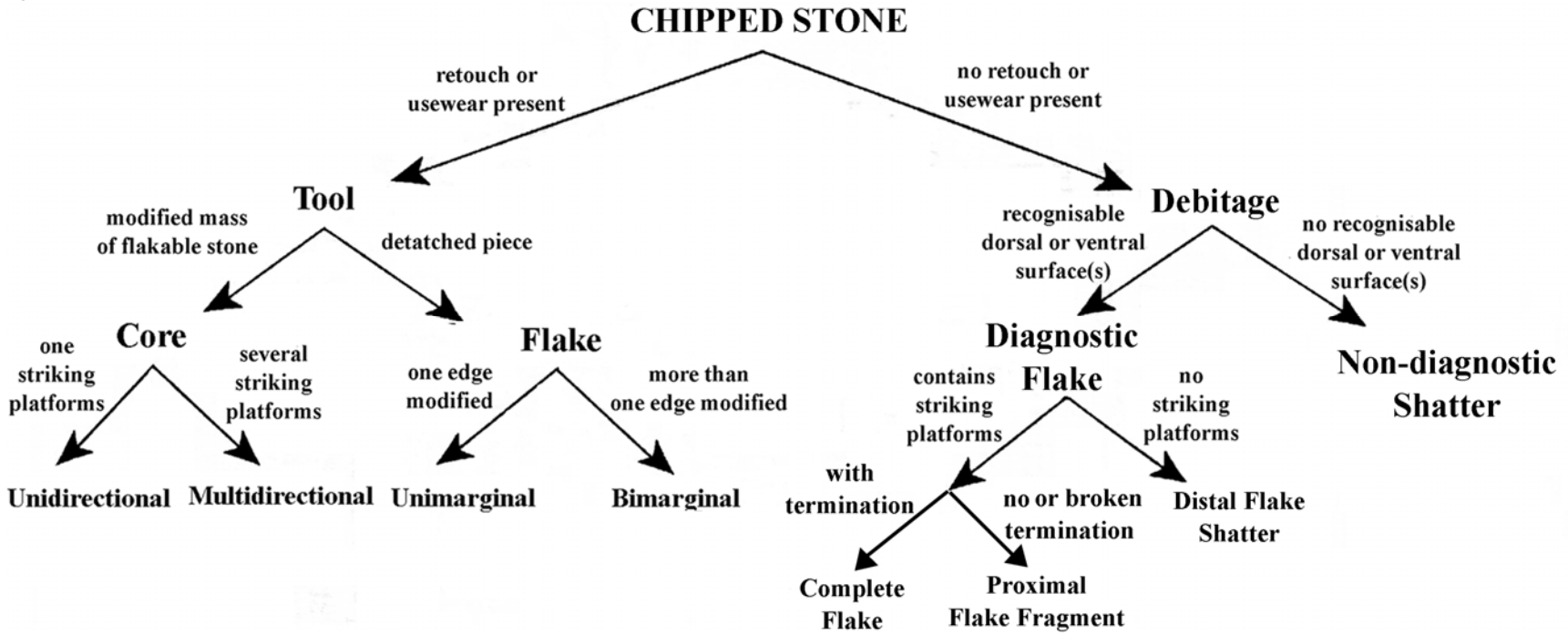

Figure 12 General Flow Chart used in this analysis

(Modified from Andrefsky 1999)

The artefacts were classified into general categories:

- Pebbles split pebbles and fragments and flaked pieces,
- side and end chopper,
- complete flakes,
- Tools- flakes with utilised edges (FTU1),
- backed blades,
- broken flakes,
- cores,
- hammerstone fragments

Pebbles

These are unmodified stone pebbles which were not considered to be naturally occurring but which possibly were brought to the site; called manuports. These varied in size from hand sized river cobbles to small pebbles less than 5cm in length. The larger cobbles probably represent the source material on which choppers were manufactured

Figure 13: Example of large manuport. TP 2A -7 A2 Depth 0-10 cm

The purpose of the smaller pebbles was unclear however the CHLALC believed they were being purposely brought to site along with the larger river cobbles, probably as raw material for manufacture.

Figure 14: Types of small pebbles. TP 2-2 Depth 10-20cm

Split pebbles and fragments

These varied from hand sized longitudinally or horizontally split cobbles or fragments of cobbles deriving from testing of the pebble or deliberate shaping. They may represent the next stage from the unmodified pebbles where material is tested for suitable qualities for flaking. Over the 15 transects split pebbles represented 21% of the total however in the 2A -7 extension they represented 36% of the assemblage.

Side Chopper /end chopper.

These were heavy duty implements made on large pebbles. Cobbles appear to have been brought to the site then tested. The suitable piece was then flaked to produce the cutting edge. These dominate the surface collection tool assemblage with 15% comprised of these implements. In contrast less than 1% of this type was recovered in excavation. Segments of split pebbles were also worked to produce an edge along one margin presumably to perform the same chopping tasks. Figure 15 shows examples of pebbles and cobbles roughly modified to produce a flaked edge.

Figure 15: Example Choppers found in surface collections A - WP 409; B - WP 412; C - WP 422 end chopper; D - WP421

Figure 16: Example Chopper and chopper fragments found in surface collections A 424 B426 C427 D 420

Detail of edge of surface collected chopper 391

TR 1B – 4 0-10 longitudinally split cobble

Figure 17: Examples of Choppers found excavations

Complete Flakes

The flakes displayed diagnostic features such as striking platforms, bulbs of percussion, eraillure scars and terminations. The flakes were unmodified but had evidence of secondary flakes on the dorsal surface and a lack of cortex. Forty eight percent of the excavated material was complete flakes. Most of the coarse grained material was roughly formed and probably results from the testing of the cobbles; rather than flaking to produce a flake tool.

Figure 18: Examples of flakes TP2a- 4 Depth 20-30 cm

Backed blade

One blacked blade (microlith) made on a fine grain siliceous material was found (Figure 18). Backing indicates retouch which removes sharp edges or projections to provide a better grip or anchorage

FTU1

Flake tools with usewear or retouch along one edge represented eight percent of the assemblage.

One glass fragment (FTU1) was found at TR 1A Test Pit 5 at a depth of 10 -20cm (Figure 19). This piece had evidence of having been worked. The authenticity of glass artefacts is often doubted as trampling can produce glass fragments which closely resemble those resulting from knapping; however this piece is considered to be worked in a similar fashion to stone artefacts. The worked glass represents evidence of post European Aboriginal occupation of the area and it demonstrates that for a period after European occupation traditional practices continued with a slight shift to new raw materials.

Figure 19: Backed blade TR 3d TP 3 d

Figure 20: Worked glass TP2a- 4 Depth 20-30 cm

Cores

These items had one or all of accepted artefact characteristics i.e. platforms, secondary flaking retouch, and use wear. Four cores were identified; these were manufactured on coarse grain and fine grain material.

Figure 21: Small core on fine grain siliceous material. TP2a- 7 Depth 0-10 cm

Flaked pieces

Ten percent of the fragments of stone were recorded as flaked pieces. These are items that display some artefact characteristics such as negative flaking, but lack other diagnostic features such as a bulb of percussion or platform.

Ochre

Eight fragments of ochre were found (one each in Tr 1, 1b, 1a, 2a, and 3 with 4 in 3a}.

European material

- Unworked glass was found in Tr 2a, 3 and 3a along the ridge crest ;
- Porcelain fragments were found in Transect 1;
- Metal fragments were found in Tr 3;
- A plastic pipe stem and orange plastic flagging fragments in 3a ;
- A piece of aluminium was found in tr 3c; and
- Introduced gravel was found along Tr 3, 2a and 2.

Raw Material

Raw material used for stone artefact manufacture was recorded as coarse grain siliceous (CGS) and fine grain siliceous (FGS). Although the CHLALC representatives identified some of the fine grain siliceous material as local Jaspers and cherts.

Transect 2A and extension

Transect 2A runs south across a knoll overlooking a lagoon (less than 500m south) and the river (less than 1 km south). The CHLALC identified this area as the route by which access from the river to the northern valleys could be easily made.

While the excavated material across all transects demonstrated that the same activities were being carried out across the ridge tops Transect 2a displayed a higher density of material than any other transect. In particular test pit 7 displayed unusually high densities of stone. Transects 1 - 15 ranged in density between 2 (on the low slopes) artefacts/cu m and 26/cu m (along Tr 1a and 3. while Tr 2A had an average of 56/cu m and the extension a density of 173/cu m. Investigation along Transect 2b at right angles from TP 2A 7 extending east and west suggested that the material decreased in density rapidly away from TP 2A 7. This suggested an activity area located within a 2m area. The high percentage of split pebbles, complete flakes and broken flakes suggests that testing If stock piled at this location.

Table 7. Artefact types in Tr 2a TP 7 extension

test pit	UP	SP	SC	cf	bf	ftu1	core	fp
a	5	32	2	33	21	2	0	2
b	2	39	0	30	10	0	0	38
c	3	32	0	17	5	3	0	0
d	1	0	0	2	0	3	1	0
e	4	13	0	12	3	3	1	1
Total	15	116	2	94	39	11	2	41
%	5	36	.6	29	12	3	.6	13

TP - d was abandoned at 10 cm as pit was highly disturbed through burning of a tree stump.

Table 8. Artefact types in surface collections

Transect	unmodified pebble	split pebble/fragment	Side chopper	Other chopper	cf	bf	ftu1/2	core	hs/frag	fp	Backed blade
SF	6	16	9	1	11	0	8	0	1	3	0
BP	2	1	5	0	16	2	12	1	0	1	0
Total	8	17	14	1	27	2	20	1	1	4	0
%	8	17	15	1	29	2	21	1	1	4	0

Table 9. Artefact types in excavations along transect 1-15

Transect	unmodified pebble	split pebble/fragment	Side chopper	Other chopper	cf	bf	ftu1/2	core	hs/frag	fp	Backed blade
1	8	10	1	0	10	0	2	1	1	15	0
1a	3	25	0	0	27	7	7	1	0	2	0
1b	0	3	0	0	9	3	1	3	0	0	0
1c	2	10	0	0	9	0	0	0	0	0	0
2	16	15	1	0	16	16	9	0	1	32	0
2a	35	24	4	0	104	40	8	3	0	7	0
2b	1	15	0	0	6	2	3	0	0	0	0
3	26	26	1	0	53	9	6	3	0	3	0
3a	4	33	0	0	81	23	7	1	0	0	0
3b	0	11	0	0	6	7	0	0	0	0	0
3c	2	8	0	0	8	4	2	0	0	0	0
3d	3	3	0	0	4	3	1	0	0	0	1
3e	3	9	0	0	20	12	0	0	0	0	0
4	0	1	0	0	4	2	0	1	0	0	0
5	0	0	0	0	3	0	2	0	0	0	0
Total	103	193	7	0	360	128	47	13	2	59	1
%	11	21	.8	0	39	14	5	1	.2	6	.1

6.2.8 Summary

Disturbance consisted of tree roots and later tree removal, ploughing and other farm activities. Nevertheless movement of artefacts appears to have been minimal and may be restricted largely to vertical displacement within the upper A horizon. The focus on site appears to be on making and using heavy duty side choppers. River cobbles brought to the site are split producing most of the debitage. Material is mainly coarse grained however a limited selection of fine grained material producing elongate flakes found. Cores were found on coarse and fine grained material. The technique for producing flakes was percussion with no evidence of bipolar technique. The range of raw materials varies little across the site consisting almost entirely of fine and coarse grain siliceous material. This material is locally available and widely used in the Coffs Harbour area.

Artefacts area found across ridges (Figure 22) with three definite concentrations – the borrow pit, Tr 2a and Tr 3a. The artefacts represent purposeful manufacture, use and maintenance of heavy duty choppers presumably to utilise the resources of the surrounding wetlands and hinterland slopes. The sample collected through excavation and surface collections provides useful information regarding the general patterns of behaviour at this local and these can be compared with surrounding sites to create a greater understanding of human behaviour in the cultural landscape. The sample collected expands local knowledge of the use of the woodlands behind the major campsites found on the Bonville estuary.

The research themes broadly investigated in the sub surface testing were:

- What kind of usage is demonstrated adjacent to the wetlands and along the ridge lines?
- Is there evidence of ocupation in these areas and is it limited to small artefact scatters or do stratified deposits occur?

The results of the subsurface investigations have demonstrated that there was repeated and extensive use of the ridge crests. Upper and lower slopes and the watercourses had little evidence of repeated activities. The activities on site are focused towards tasks requiring heavy duty implements, presumably wood working and plant processing.

The CHLALC walked a line from the lagoon in the Bongil Bongil National Park north up slope to Transect 2a along Transect 2 and 1 south to Lyons Road. It was their opinion that this route was an easy transit route from the river into the Boambee Valley to the north.

6.2.9 Significance Assessment

Aboriginal sites are significant and they are protected under the *National Parks and Wildlife Act 1974.* Archaeological investigation is primarily used to assess the scientific significance of the site. The significance of the site to the Aboriginal community is determined by the Aboriginal stakeholders.

Low scientific significance is ascribed to a site which presents data confirming previously well established knowledge rather than contributing new evidence to the understanding of the prehistory of the area.

Moderate to high scientific significance is conferred on site which provided new insight into an established research question.

High scientific significance is ascribed to sites where the contents are demonstrably rare or where the site represents a type of site which was once common but is now under threat regionally.

The landscape and all it contains has significance to Aboriginal people.

There are four generally accepted types of cultural value in material objects:

1. Aesthetic value - this value often outweighs other cultural values in the eyes of the general public. It is easier to appreciate the aesthetic value of a gallery of Aboriginal paintings because they are beautiful, rather than a scatter of stone tools that may have great antiquity and great scientific potential; or a well preserved house of the pastoral era over a wood hut.

2. Economic value - this ranges from the price an object may bring on the open market to considerations of the tourist dollars it might attract. It also relates to questions of the relative economic value, when choices have to be made say between preserving a suite of sites and developing an area for agriculture.

3. Information value - this is the value that most often concerns archaeologists. Data generation through surface collections, excavations, and analyses can mitigate any loss of information due to the disturbance or destruction of sites by development.

4. Associational or symbolic value - a widely perceived value of sites and artefacts in an associational or symbolic context lies in their ability to foster group or national identity.

Further subsurface excavation within the current development area is not recommended because

- the extensive subsurface testing programme carried out indicates that additional excavation would produce similar results; and
- the CHLALC are satisfied that the site has been investigated to its potential.

The scientific significance of the site has been assessed as moderate to high. The site has provided insight into use of hinterland gullies and swamp areas behind the coastal zone by indicating that the area has probably been accessed to undertake short term gathering or foraging activities.

The significance of the material found during the sub surface programme was discussed with the representatives of the CHLALC. The representatives considered the material to have a moderate to high scientific and educational significance and asserted that the material was culturally significant as it provided evidence of Aboriginal use of the area.

6.2.10 Recommendations

The following recommendations are based on:

- the results of the excavation conducted on the Lot between 2nd November and 20h November 2009;
- discussions held with the CHLALC senior sites officer during, and at the conclusion of, the excavation work;
- the concerns and wishes of the CHLALC; and
- the current plans of the proposed residential development.

Recommendation 1

Recommendation 1 Remove the ridge topsoil on all ridges within the development area including the outer perimeter roadways located on the ridges. This work will take place prior to any other construction activity occurring on the site. The topsoil will be removed to a reserve area (determined by the CHLALC and the developer). No other activity will occur until this work is complete.

Recommendation 2

Record the relocated location of the ridge topsoil as a relocated site with DECCW Aboriginal Heritage Information Management System.

Recommendation 3

Relocation of ridge topsoil should be monitored by CHLALC.

Recommendation 4

After the ridge topsoil has been relocated, a walkover of the removal areas should be conducted by the CHLALC and any visible artefacts collected.

Recommendation 5

Collected artefacts will be redeposited in a secure location on site negotiated between Utila and the CHLALC.

Recommendation 6

Street names in the development should acknowledge the Traditional Owners of the area. Consultation with the CHLALC and the CGCC should be undertaken to ascertain suitable names for the streets

6.3 Development Impact and mitigation

The development will impact the ridges and slopes across the lot with the establishment of a residential precinct with associated infrastructure. A riparian zone will be created along the central gully but water management facilities will be established within the zone and these will impact artefacts present along the water course.

A Management Plan has been developed to manage the identified and potential cultural heritage issues. A work statement has been provided for the monitoring of topsoil removal activities and the re deposition of material and artefacts in a designated reserve area.

This management plan has been reviewed by Utila and has been accepted. Utila agrees to involve the stakeholders in the implementation of the plan. The CHLALC have agreed to the removal of top soil and the relocation of stone artefacts found during that activity and during the test excavation to a secure location to be determined on site.

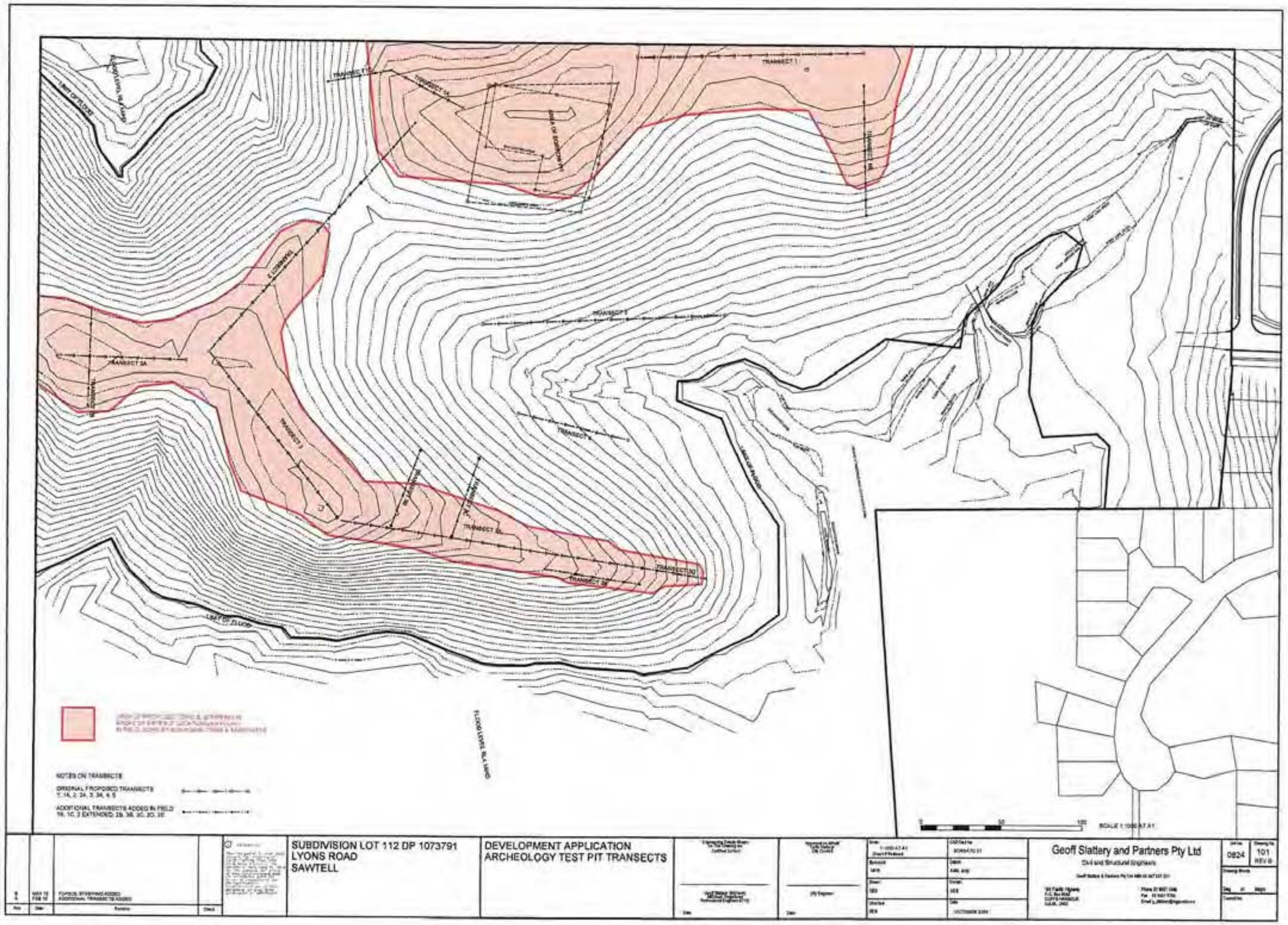

Figure 22 Areas of greatest concentration

Cultural Heritage Management Plan
Lot 112 DP1073791 Lyons Road, Bonville, NSW.

Management Issue - Indigenous	Action
Prior to Removal of topsoil (ridges)	• Prior to commencement of activity contact CHLALC and negotiate a procedure and suitable relocation site • Engage representatives to attend on site • Provide CHLALC with appropriate information regarding the work schedule
During top soil removal	• On site all contractors should follow instruction of the CHLALC representative during any top soil removal. • Relocation of ridge topsoil should be monitored by CHLALC. • After the ridge topsoil has been relocated, a walkover of the removal areas should be conducted by the CHLALC and any visible artefacts collected • Record the relocated location of the ridge topsoil as a relocated site with DECCW Aboriginal Heritage Information Management System.
Relocation of artefacts found during the test excavation to the reserve area	• consult with CHLALC as to procedure required for this activity • Provide CHLALC with necessary equipment for reburial of artefacts recovered in test excavation and negotiate the timing of the reburial.
Procedures during construction (see below)	
Aboriginal cultural material located on site by a contractor, subcontractor or worker.	• Cease work at the location where the cultural material has been found and the location from where the material originated from. • Notify the site supervisor or manager.
Site supervisor notified that Aboriginal cultural material has been located on site	• Ensure work has ceased at the location the where the cultural material has been found and the location from where the material originated from. • Work may continue at a distance of not less than 50m from the location unless there are physical indications that the boundary should be broader. • The material should not be removed until further advice is sought. Use soft fencing as a buffer if required. • If there are Coffs Harbour Local Aboriginal Land Council monitors on site, notify them and seek advice on how they wish to proceed. • If there are no monitors on site, the CHLALC and the consultant archaeologist should be contacted for advice on how to proceed.
Aboriginal cultural material assessed by the CHLALC to be of no cultural and/or scientific significance	• The CHLALC may wish to collect the cultural material under the Care and Control of Cultural Objects permit held by the CHLALC. No work is to proceed at the location until the material in question has been collected. • Work may then proceed as normal.

Aboriginal cultural material assessed by the CHLALC to be of cultural and/or scientific significance	• No work may proceed at the location. • The consultant archaeologist should be contacted to advise the action required. The scale and nature of the action will depend on the type of Aboriginal cultural material that was found. • The Department of Environment Climate Change and Water (DECCW) should be notified and advice sought as to requirements for further evaluation. • Soft fencing should be installed to ensure the location is not impacted by work in other areas of the Lot. • An investigative study of the significant Aboriginal cultural material should be conducted and conservation and/or management strategies developed. • If the material can be moved and the CHLALC have assessed this to be a suitable management option, an archaeological recovery plan should be developed and the material moved in accordance with the plan. • If the material cannot be moved and must remain in the location, a Conservation Plan should be developed.
Management Issue - Historical	**Action**
Historical cultural material located on site by a contractor, subcontractor or worker.	• Cease work at the location where the historical material has been found and the location from where the material originated from. • Notify the site supervisor or manager.
Site supervisor notified that Historical cultural material has been located on site	• Ensure work has ceased at the location the where the historical material has been found and the location from where the material originated from. • Work may continue at a distance of not less than 50m from the location unless there are physical indications that the boundary should be broader. • The material should not be removed until further advice is sought. Use soft fencing as a buffer if required. • Contact the consultant archaeologist for advice on how to proceed.
Historical material assessed to be of no significance	• The material should be recorded. • Work may then proceed as normal.
Historical material assessed to be of local, regional or state significance	• No work may proceed at the location. • The Department of Environment Climate Change and Water (DECCW) should be notified and advice sought as to requirements for further evaluation. • Soft fencing should be installed to ensure the location is not impacted by work in other areas of the Lot. • An investigative study of the significant Historical material should be conducted by the consultant archaeologist and appropriate conservation and/or management strategies developed. • If the material can be moved and DECCW have assessed this to be a suitable management option, an archaeological recovery plan should be developed and the material moved in accordance

	with the plan. • If the material cannot be moved and must remain in the location, a Conservation Plan should be developed.
Management Issue – Human Remains	**Action**
Human remains (Indigenous or Non-Indigenous) located on site by a contractor, subcontractor or worker.	• Cease work at the location where the cultural material has been found and the location from where the material originated from. • Notify the site supervisor or manager.
Site supervisor notified that human remains have been located on site	• Ensure work has ceased at the location the where the human remains have been found and the location from where the remains originated from. • All personnel and contractors on site should be advised that it is an offence under the *Criminal Code Act 1899* to interfere with human remains. • Work may continue at a distance of not less than 50m from the location unless there are physical indications that the boundary should be broader. • The material should not be removed until further advice is sought. Use soft fencing as a buffer if required. • The NSW Police and the consultant archaeologist should be contacted for advice on how to proceed.
NSW Police deem the location of the human remains to be a crime scene	• The area now falls under the jurisdiction of the NSW Police.
NSW Police deem the remains to be human, but not a crime scene	• Contact the consultant archaeologist to determine if the remains are European or Aboriginal and for advice on how to proceed. • If the remains are of European origin, DECCW should be contacted for advice on how to proceed. • If the remains are of Aboriginal origin, the *Aboriginal and Torres Strait Island Heritage Protection Amendment Act 1987* applies. DECCW and the CHLALC should be notified. • The burial should be recorded by the consultant archaeologist in sufficient detail to ensure its future protection. All recording work and further action should be conducted with consideration of the guidelines of the applicable Act or governing body.
NSW Police deem the remains not to be human	• Following Police clearance, work may proceed on the site.

Work Method Statement

1. Contact the stakeholders
   - to determine where the reserve area will be for the respreading of topsoil and nominate a secure area within the reserve area for relocation of recovered artefacts;
   - the number of representatives to participate in the work; and
   - arrangement of a work contract (including a schedule, daily work hours, rates, equipment required, and work health and safety requirements).
   - Designate an on site supervisor to whom both the contractors and the stakeholders can report.
   - Develop a letter Memorandum of Understanding clearly stating all requirements and commitments.
   - Notify stakeholders at least two weeks prior of the schedule of works and commencement date.

2. Prior to commencement of work on site
   - All contractors to attend an on site cultural heritage induction conducted by the stakeholders.
   - All matters concerning cultural heritage will be directed by the stakeholder representatives and all contractors must follow any reasonable instructions.
   - The stakeholders will agree to follow all reasonable instructions regarding on site operations.

3. Work method
   - The area to be worked will be walked by the representatives and any obvious visible artefacts will be collected. The stakeholders will be responsible for all recording of items if required.
   - Once work commences each topsoil scrape at the original position will be inspected. Any visible artefacts will be collected.
   - The top soil material will be deposited into trucks and transported to the designated removal area
   - The stakeholders will inspect the respread material and collect any artefacts if required.

4. Completion of topsoil removal.
   - Once all top soil is relocated to the reserve area any collected artefacts (including the test excavation material if required by the stakeholders) will be placed together in an agreed location where no further disturbance will occur
   - The GPS position of this point will be recorded and the GPS points for the entire boundary of the relocated top soil will be recorded. (Qualified surveyor may be required for this work).
   - A site card should be completed and lodged with the DECCW as a record of the relocated artefacts.

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Glossary

Artefact	Any object made by human agency.
Assemblage	A range of artefacts found in close association with each other and deemed to belong to the one period of human activity.
Backed Blade	*A stone artefact, blade shaped, with one margin deliberately trimmed to provide an edge where pressure could be applied to the opposite, cutting edge.*
Basalt	A fine grained, often porphyritic, darkly coloured, igneous rock.
Blade	Parallel sided flake, approximately twice as long as wide.
Bulb	Conchoidal fracture characteristic usually found on a flake.
Bulb of percussion	Diagnostic feature found on the surface of a flake.
Carboniferous	The time interval between 360 and 290 million years ago.
Chalcedony	A cryptocrystalline silica mineral with a large number of varieties including agate, onyx and jasper (Holdaway & Stern 2004:24).
Chert	A cryptocrystalline siliceous rock of organic or inorganic origin. It is isotropic and generally has a low fracture toughness (Holdaway & Stern 2004:23).
Chopper	A heavy coroid or knapped piece with the working edge opposite a thick margin (McCarthy 1976:101).
Conchoidal fracture	Shell-like, bulbed and curved rippled zone resulting from fracture of certain rock types.
Core	A piece of stone from which flakes of stone have been removed. Cores are generally characterised by negative flake scars.
Core tool	A core with evidence of trimming and/or use-wear indicating its use as an implement.
Cortex	The naturally weathered surface of rock, not the result of human activity (McCarthy 1976:101). Cortex is generally of two kinds; water worn or coroid/oxidization.
Crest	Landform element standing above all or most points in the adjacent terrain. Usually smoothly convex (Speight 1990:13).
Debitage	Non-functional by products of the stone artefact manufacturing process. Discarded flaked stone material, often showing no evidence of flaking, but associated with the flaking process.
Dorsal	The surface of the flake that was originally part of the surface of the core (Holdaway & Stern 2004: 7).
Distal	The opposite end of a stone artefact to the platform end.
Eraillure scar	A feature of conchoidal fracture consisting of a small scar resulting from the impact process usually associated with the point of force impact on the flake platform.

Flake	A piece of stone detached from a larger stone by the application of force. A flake may exhibit any or all of the characteristics consistent with flake production i.e. platform, bulb of percussion, feather, hinge or step termination, eraillure scar, PFI.
Flake Length	Percussion length; the length from the point of percussion to the most distal point (Holdaway & Stern 2004: 137).
Flaked piece	Flaked fragments that cannot be identified in any more detail, i.e. fragments that cannot be classified as proximal, medial or distal flakes, also known as angular fragments (Holdaway & Stern 2004: 114).
Flake scar	Scars left on the surface of a core or flake resulting from flake removal.
Greywacke	A sedimentary very hard, dark grey or greenish-grey, coarse-grained sandstone.
Hammerstone	A stone implement used to produce other stone tools and/or to grind plant materials.
Hearth	The site of a campfire, usually indicated by the presence of charcoal, burnt earth, and soil discolouration.
Hillslope	A gently inclined to precipitous slope, eroded by sheet wash, creep or water-aided mass movement (Speight 1990:31).
Holocene	The most recent epoch of geological time span over the last 10,000 years.
Manuport	Stone material that is believed to have been transported to a site but has no diagnostic features.
Microlithic	A term used to refer to stone artefact assemblages characterised by tools which have individual maximum dimensions less that 3cm.
Midden	The accumulated debris of human occupation including food refuse, shell, bone and stone artefacts (McCarthy 1976:101).
Millstone	A stone artefact used for grinding seeds, fruits, foodstuffs and sometimes bone and ochre.
Modification	A term used to describe artefactual characteristics such as secondary flaking, retouch or use wear.
Negative flake scar	Concave surface representing the removal of a flake.
Ochre	Stone pigment often used for decorative/ceremonial purposes.
Open campsite	A surface scatter of artefacts, usually consisting of stone artefacts.
PAD	Potential archaeological deposit – an area assessed to be archaeologically sensitive and considered to have potential to yield archaeological information.
Pebble	A stone worn and rounded by water and other natural forces (McCarthy 1976:101).
Platform	Planar surface of a flake marking the place where a hammerstone struck the core, also known as the striking platform (Holdaway & Stern 2004: 5).
Point of force impact (PFI)	A term referring to the point of force impact scarring found on a core or flake indicating where impact occurred during the reduction process.
Quartz	Crystalline silica which contains flaws that influence its fracture pathways.

Quartzite	A quartz-rich sandstone that has been recrystallised by heat, by pressure or by both (Holdaway & Stern 2004:24).
Retouch	The modification of the edges of a tool by the removal of a series of small flakes.
Ridge	A compound landform element comprising a narrow spine crest and its immediately adjoining slope with the spine length being greater than the width (Packard 1992:100).
Saddle	Landform element comprising a lower, relatively level point along the spine of a ridge or spur (Packard 1992:100).
Silcrete	Quartz grains in a matrix of wither amorphous or fine-grained silica (Holdaway & Stern 2004: 24).
Scraper	A stone tool usually manufactured from a flake and often with one or more working edges which display secondary flaking and/or use wear.
Spur	Landform element comprising a lower, subsidiary ridge leading down from a locally dominant ridge or crest (Packard 1992:100).
Stratigraphy	Superimposed layering of deposits, with older material overlain by more recent material.
Termination	The distal end of a flake which may exhibit one of the following morphologies; ❖ feather termination: a sharp edge with a minimal margin, indicative of good knapping control. ❖ hinge termination: a blunted or rounded right angle break, indicative of poor knapping control. ❖ overpass termination: the ventral surface of the flake curves away from the dorsal surface and continues directly into the core, removing the base of the core to result in the flake having a J shape in longitudinal cross section. ❖ step termination: an abrupt, right angled break, indicative of poor knapping control.
Unifacial	A term used to describe stone artefacts that have been flaked on only one surface.
Upper slope	A slope landform element adjacent below a crest or flat but not adjacent above a flat or depression (Speight 1990:11-34).
Use wear	A term used to describe the worn or smooth area produced on the working edge of a stone tool resulting from the use of the tool.
Valley flat	A small, gently inclined to level flat, aggraded or sometimes eroded by channelled or over-bank stream flow, typically enclosed by hill slopes (Speight 1990:34).
Ventral	The face of a flake that was attached to the core before removal of the flake.
Width	The longest line that can be drawn at right angles to the length dimensions (Holdaway & Stern 2004: 139).

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