



Coffs Harbour & District Local Aboriginal Land Council

Cnr Pacific Highway & Arthur Street, Coffs Harbour NSW 2450

PO Box 6150, Coffs Harbour Plaza NSW 2450

Phone (02) 6652 8740 Fax: (02) 6652 5923

CLIENT DETAILS

Client Name:	Dr Chandran Arianayagam Mr Kieran Grimley Dr Ian Martyn
Site for inspection	28 Sugarmill Road, Sapphire Beach, 35 Sugarmill Road, Sapphire Beach, 89 Sugarmill Road, Sapphire Beach
Client contact name	Graeme Fry

COFFS HARBOUR AND DISTRICT LOCAL ABORIGINAL LAND COUNCIL

Site officer name	Uncle Ian Brown & Aunty Luana Ferguson
Date	Monday 27 th September 2021
Start Time	9:30am – 13:30pm
Nature of the works	Rezoning

SITE OFFICER OBSERVATIONS

Artefacts	Dreaming site	Midden material	Campsite	Ceremony ground
None	None	None	None	None

Scar trees	Skeletal remains	Increase site	Men/Women's area	Other (specify)
None	None	None	None	N/A

Notes – Sites Officer only	
<ul style="list-style-type: none"> The area of interest was fully examined by one Senior Cultural Site Officer and one Cultural Site Officer. No physical evidence of cultural items or sites were found. 	
Recommendations	
<ol style="list-style-type: none"> Unexpected finds procedure to be implemented to any future ground disturbance works as per relevant cultural heritage protection legislation. Contact the Land Council or Heritage Division should any unexpected finds be uncovered. 	

Observations compiled by Senior Sites Officer, Uncle Ian Brown.

Report approved and signed off by:

Matthew Smith
Programs Coordinator
CH&DLALC
28th September 2021

SEPTEMBER 2015

Korora West Sapphire Moonee Large Lot Residential Constrains Study: Heritage Assessment



COFFS HARBOUR

PREPARED FOR COFFS HARBOUR CITY COUNCIL



Report Reference:

Hill, T., Towers J and Robins, T. 2015 *Korora West Sapphire Moonee Large Lot residential study: Heritage Assessment* Everick Heritage Consultants Pty Ltd unpublished report prepared for Coffs Harbour City Council.

EVERICK HERITAGE CONSULTANTS PTY LTD

ABN: 78 102 206 682

47 Arthur Terrace

PO Box 146

RED HILL, QLD 4059

T: (07) 3368 2660

F: (07)3368 2440

E: info@everick.com.au

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EXECUTIVE SUMMARY

The following is a report detailing the Heritage Study for the proposed Korora, West Sapphire, Moonee Large Lot Residential Study north of Coffs Harbour, NSW (the 'Project'). The lands subject to assessment are identified in Figure 2 (the 'Study Area'). The intent of this investigation is to identify any significant heritage places, objects or issues that might be considered as constraints to future development of these areas.

The brief for this project was to "undertake an assessment as to the items or areas of Aboriginal cultural heritage, as well as post-European settlement heritage" and provide "Appropriate management strategies ... if Aboriginal or post-European settlement sites of significance are found".

The methods employed in this assessment included:

- a) a search of relevant Aboriginal heritage registers;
- b) a brief review of the archaeological and cultural heritage assessments pertinent to the potential heritage values associated with the Study Area;
- c) a review historic aerial photographs of the Study Area; and
- d) a series of site inspections across the Study Area designed to sample priority areas based on the literature review ;
- e) assessment of the potential for the Study Area to contain significant Aboriginal and European heritage and the impact that future development may have on significance heritage places and objects.

A search was conducted on 5 August 2015 of the OEH Aboriginal Heritage Information Management System (AHIMS service number 184338) the Project Area. The search returned a total of nine (9) listings for Aboriginal Cultural Heritage sites within the Project Area. All of the recorded sites within the Project Area are open sites- being either artefact scatters with overall low density of artefacts or isolated finds. The recorded sites are located on lower valleys and slopes in the eastern section of the Project Area- with the exception of Korara 2 and PAD which is located off a relatively large ridgeline approximately 75 masl and therefore possibly mapped inaccurately. The AHIMS entry does not include any report or permit reference numbers to confirm the accuracy of this site.



Given the scale of the study area and the methodological constraints identified by similar studies (i.e. Hudson 2009) the study methodology aimed to broadly understand the landscape in the context of the Due Diligence Code of Practice, and particularly Question 2b “Is the activity in an area where landscape features indicate the presence of Aboriginal cultural heritage?” The study included a vehicle-based visual inspection of the Study Area to document the characteristics of slope; aspect; disturbance and proximity to mapped creeks. The second part of the methodology was to use digital models to define areas which met the criteria under the Due Diligence Code of Practice which would require additional investigation. These areas were mapped and compared to the areas identified as being available for access for fieldwork through land-owner support/ approval.

Based on the investigations undertaken as part of the Study it is possible to identify the following results:

There are no gazetted Aboriginal Places or Listed Historic Heritage items within the Project Area.

There are not declared historic heritage items

A total of 38 PADs were mapped using the terrain mapping data. This process allowed the identification of several ‘trends’ of relevance to the project, being;

- A high correlation between known sites and PAD areas;
- A trend towards great frequency of PAD areas to the east of the Project Area;
- A trend towards larger PAD areas to the north of the Project Area;
- An overall trend of roads and existing dwellings being located on PAD areas leading to significant disturbance;
- A relatively low number of PADs which are considered ‘undisturbed’

The investigation of potential constraints for the release of additional rural residential blocks in the Project Area has identified no significant constraints with respect to Aboriginal and European Heritage. No Aboriginal Places or Items listed under the Heritage Act are recorded within the Project Area. With respect to known Aboriginal sites and PADs the Due Diligence Code of Practice provides an adequate system for the identification and management of the types of sites likely to occur within the Project Area. There is the potential for some areas of the Project Area- particularly around Moonee Creek- to



contain regionally significant archaeological sites. The study identified a general trend towards larger potential archaeological deposits in the northern and eastern sections of the Project Area.

The Due Diligence Code of Practice is considered to provide an adequate system for the protection of Aboriginal sites that are known within the Project Area. It is recommended that the Due Diligence Code of Practice is used as a framework for assessment of potential impacts to Aboriginal heritage during all future rezoning or development applications within the Project Area. It is recommended that Coffs Harbour City Council formally consults with the OEH with regard to the practical application of the Code of Practice for future rezoning and development applications- particularly with respect to individual residential dwellings and agricultural infrastructure.



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DEFINITIONS

The following definitions apply to the terms used in this report:

Aboriginal Object means any deposit, object or material evidence (not being a handicraft made for sale) relating to the Aboriginal habitation of the area that comprises New South Wales, being habitation before or concurrent with (or both) the occupation of that area by persons of non-Aboriginal extraction, and includes Aboriginal remains.

Aboriginal Place means any place declared to be an Aboriginal place (under s. 84 of the NPW Act) by the Minister administering the NPW Act, by order published in the NSW Government Gazette, because the Minister is of the opinion that the place is or was of special significance with respect to Aboriginal culture. It may or may not contain Aboriginal Objects.

ACHCR Guidelines means the OEH Aboriginal Cultural Heritage Consultation Requirements for Proponents (2010).

Archaeological Code of Practice means the OEH Code of Practice for Archaeological Conduct in New South Wales (2010).

Due Diligence Code means the OEH Due Diligence Code of Practice for the Protection of Aboriginal Objects in New South Wales (2010).

Heritage Act means the NSW Heritage Act 2009

LEP means the Coffs Harbour Local Environment Plan 2013

NPW Act means the National Parks and Wildlife Act 1974 (NSW).

NPW Regulations means the National Parks and Wildlife Regulations 2009 (NSW).

OEH means the New South Wales Office of Environment and Heritage.

Project Area means the land subject to this assessment, being the hinterland areas of Korora, West Sapphire and Moonee as identified by Coffs Harbour City Council and as illustrated in Figure 2.

Study Area means the land subject to this assessment, being 'unconstrained' potential large lot residential areas in Korora, West Sapphire and Moonee as identified by Coffs Harbour City Council and as illustrated in Figure 2.

The Consultant means qualified archaeological staff and/or contractors of Everick Heritage Consultants Pty Ltd.



1. INTRODUCTION

1.1 Purpose of the Archaeological Investigation

The following is a report detailing the Heritage Study for the proposed Korora, West Sapphire, Moonee Large Lot Residential Study Area north of Coffs Harbour, NSW (the 'Project'). The lands subject to assessment are identified in Figure 1 and Figure 2 (the 'Study Area').

The intent of this investigation is to identify any significant heritage places, objects or issues that might be considered as constraints to future development of these areas.

1.2 Proponent, Project Brief & Methodology

Everick Heritage Consultants (the 'Consultant') were commissioned by Coffs Harbour City Council on to undertake the heritage assessment for the Study. Eco Logical Australia Pty Ltd have been engaged by Coffs Harbour City Council to undertake and project manage the broader Planning Constraints Study of which the Heritage Study is one component.

The brief for this project was to "undertake an assessment as to the items or areas of Aboriginal cultural heritage, as well as post-European settlement heritage" and provide "Appropriate management strategies ... if Aboriginal or post-European settlement sites of significance are found".

The methods employed in this assessment included:

- a) a search of relevant Aboriginal heritage registers;
- b) a brief review of the archaeological and cultural heritage assessments pertinent to the potential heritage values associated with the Study Area;
- c) a review historic aerial photographs of the Study Area; and
- d) a series of site inspections across the Study Area designed to sample priority areas based on the literature review ;



- e) assessment of the potential for the Study Area to contain significant Aboriginal and European heritage and the impact that future development may have on significance heritage places and objects.

1.3 Description of the Project Area

The Project Area includes lands west of the Pacific Highway; north of West Korora Road; east of the Sealy Lookout Drive and Orara East State Forest, and south of the Moonee/Pacific Highway/ Solitary Islands Way interchange. The area relevant to the Study includes the following major roads Maccues Road; Fairview and Wakelands Roads; Gaudrons Road; The Mountain Way; Bruxner Park Road and West Korora Road and linked smaller roads (Figure 2).

1.4 Report Authorship

The desktop study was undertaken by Senior Archaeologists Tim Hill and Frances Wiig and qualified Archaeologist Jordan Towers. The field inspection was conducted by Senior Archaeologist Tim Hill. This report was written by Tim Hill, Frances Wiig, Jordan Towers and Everick Director Tim Robins.

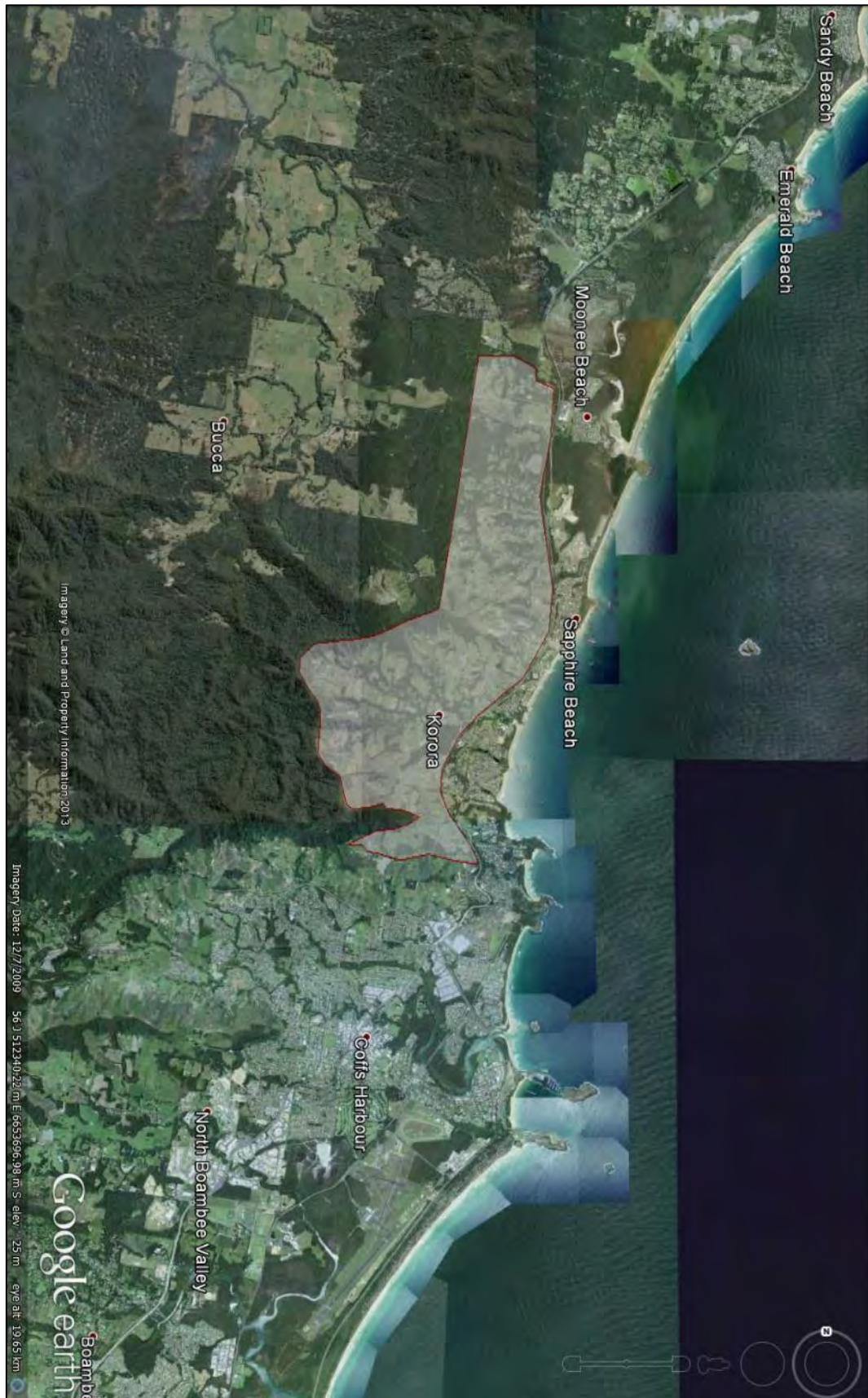


Figure 1: General location of Project Area.

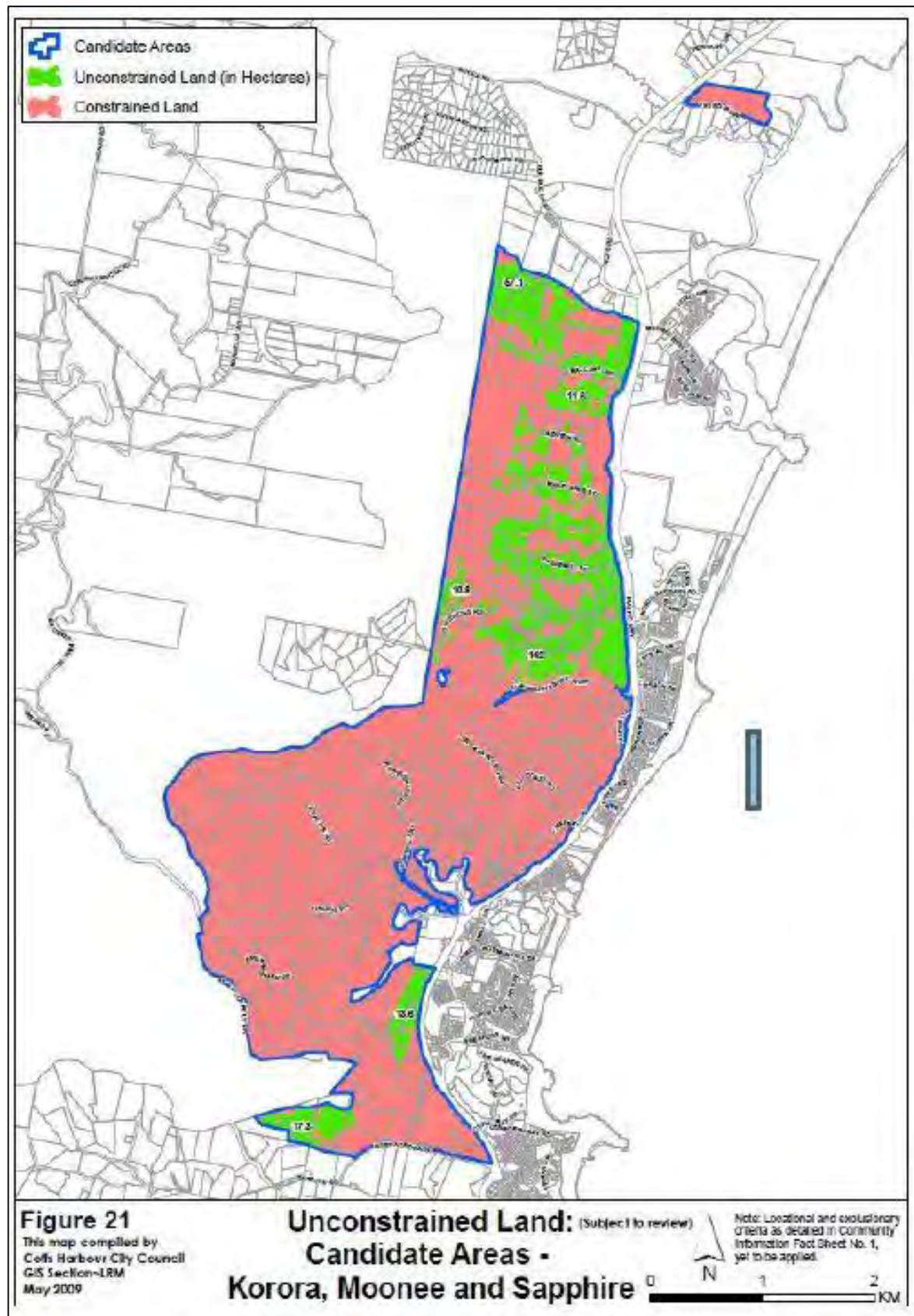


Figure 2: Project Area constrained and unconstrained lands



2. LEGISLATIVE AND PLANNING CONTEXT

The following legislation provides the context for cultural heritage in NSW: the *National Parks and Wildlife Act 1974* (NSW), the *Environmental Planning and Assessment Act 1979* (NSW) and the *Heritage Act 1977* (NSW) and local council Environmental Plans and Development Control Plans. The Commonwealth also has a role in the protection of nationally significant cultural heritage through the *Environmental Protection and Biodiversity Conservation Act 1999* (Cth), *The Protection of Movable Cultural Heritage Act 1986* (Cth) and the *Historic Shipwrecks Act 1976* (Cth).

For the purposes of this Study it is the State and local legislation that are most relevant for residential development projects. The consent authorities will be the Coffs Harbour City Council and, where a referral agency is required, the OEH. Approval from the OEH will also be required should proposed residential works impact on identified Aboriginal Objects, Places or listed Heritage properties. The information below lists the legislative and policy framework within which this assessment is set.

2.1 The National Parks and Wildlife Act 1974 (NSW) and the National Parks and Wildlife Regulations 2009 (NSW)

The *National Parks and Wildlife Act 1974* (NSW) (NPW Act) is the primary legislation concerning the identification and protection of Aboriginal cultural heritage. It provides for the management of both Aboriginal Objects and Aboriginal Places. Under the NPW Act, an Aboriginal Object is any deposit, object or material evidence (not being a handicraft made for sale) relating to the Aboriginal habitation of the area, regardless of whether the evidence of habitation occurred before or after non-Aboriginal settlement of the land. This means that every Aboriginal Object – regardless of its size or seeming isolation from other Objects – is protected under the Act.

An Aboriginal Place is an area of particular significance to Aboriginal people which has been *declared* an Aboriginal Place by the Minister. The drafting of this legislation reflects the traditional focus on Objects, rather than on areas of significance such as story places and ceremonial grounds. However, a gradual shift in cultural heritage management practices is occurring towards recognising the value of identifying the significance of areas to Indigenous peoples beyond their physical attributes. With the introduction of the *National Parks and Wildlife Amendment Act 2010* (NSW) the former offence provisions under Section 86 of ‘disturbing’, ‘moving’, ‘removing’ or ‘taking possession’ of Aboriginal Objects or Places



have been replaced by the new offence of 'harming or desecrating'. The definition of 'harm' is 'destroying, defacing or damaging an Object'. Importantly in the context of the management recommendations in this assessment, harm to an Object that is 'trivial or negligible' will not constitute an offence.

The new amendments also significantly strengthen the penalty provisions. The issue of intent to harm Aboriginal cultural heritage has been formally addressed by separating it from inadvertent harm. The penalty for individuals who inadvertently harm Aboriginal Objects has been set at up to \$55,000, while for corporations it is \$220,000. Also introduced is the concept of '*circumstances of aggravation*' which allows for harsher penalties (up to \$110,000) for individuals who inadvertently harm Aboriginal heritage in the course of undertaking a commercial activity or have a record for committing similar offences. For those who knowingly harm Aboriginal cultural heritage, the penalty will rise substantially. The maximum penalty will be set at \$275,000 or one year imprisonment for individuals, while for corporations it will rise to \$1,100,000.

Where a land user has or is likely to undertake activities that will harm Aboriginal Objects, the Director General (OEH) has a range of enforcement powers, including stop work orders, interim protection orders and remediation orders. The amended regulations also allow for a number of penalties in support of these provisions. The NPWA also now includes a range of defense provisions for unintentionally harming Aboriginal Objects:

- a) undertaking activities that are prescribed as '*Low Impact*';
- b) acting in accordance with the new Due Diligence Code of Practice for the Protection of Aboriginal Objects in New South Wales (2010) ('Due Diligence Code');
- c) using a consulting archaeologist who correctly applies the OEH *Code of Practice for Archaeological Conduct in New South Wales* (2010) ("Archaeological Code of Practice") (see Appendix A); and
- d) acting in accordance with an Aboriginal Heritage Impact Permit (AHIP).

2.1.1 '*Low Impact Activities*'

The new regulations allow for a range of low impact activities to be undertaken without the need to consult the OEH or a consulting archaeologist. Generally, those who undertake activities of this nature



will not be committing an offence, even if they inadvertently harm Aboriginal Objects. These activities include:

- a) Maintenance – For example on existing roads and tracks, or on existing utilities such as underground power cables and sewage lines.
- b) Farming and Land Management – for land previously disturbed, activities such as cropping, grazing, bores, fencing, erosions control etc. *
- c) Removal of dead or dying vegetation - only if there is minimal ground disturbance.
- d) Environmental rehabilitation – weed removal, bush regeneration.
- e) Development in accordance with a Development Certificate issued under the EPA Act 1979 (provided the land is previously disturbed). *
- f) Down hole logging, sampling and coring using hand held equipment.
- g) Geochemical surveying, seismic surveying, costeaning or drilling. *

* This defense is only available where the land has been disturbed by previous activity. Disturbance is defined as a clear and observable change to the land's surface, including but not limited to land disturbed by the following: soil ploughing; urban development; rural infrastructure (such as dams and fences); roads, trails and walking tracks; pipelines, transmission lines; and storm water drainage and other similar infrastructure.

2.2 Due Diligence Code of Practice for the Protection of Aboriginal Objects

The Due Diligence Code has been applied in Section 8 of this assessment. It operates by posing a series of questions for land users before they commence development. These questions are based around assessing previous ground disturbance. An activity will generally be unlikely to harm Aboriginal Objects where it:

- a) will cause no additional ground disturbance; or
- b) is in a developed area; or
- c) is in a significantly disturbed area.



Where these criteria are not fulfilled, further assessment for Aboriginal cultural heritage will typically be required prior to commencing the activity.

2.3 The ACHCRP (2010)

The OEH has published the *Aboriginal Cultural Heritage Consultation Requirements for Proponents* (2010) (ACHCRP). These requirements replaced the former *Interim Community Consultation Requirements for Applicants* (2004) (ICCR) as of 12 April 2010. The ACHCRP provide an acceptable framework for conducting Aboriginal community consultation in preparation for Aboriginal Heritage Impact Permits. Proponents are also required to follow the ACHCRP where undertaking a project that is likely to impact on cultural heritage and/or where required by the consent authority.

2.4 The Coffs Harbour Local Environmental Plan 2013

The Coffs Harbour LEP 2013 provides statutory protection for items already listed as being of heritage significance (Schedule 5), items that fall under the ambit of the *Heritage Act 1977* (NSW) and Aboriginal Objects under the *National Parks and Wildlife Act 1974* (NSW). It aims to ensure best practice components of the heritage decision making process are followed.

For listed heritage items, or building, work, relic or tree and heritage conservation areas, the following action can only be carried out with the consent of the Coffs Harbour City Council:

- a) demolishing or moving a heritage item or a building, work, relic or tree within a heritage conservation area;
- b) altering a heritage item or a building, work, relic, tree or place within a heritage conservation area, including (in the case of a building) making changes to the detail, fabric, finish or appearance of its exterior;
- c) altering a heritage item that is a building by making structural changes to its interior;
- d) disturbing or excavating an archaeological site while knowing, or having reasonable cause to suspect that the disturbance or excavation will or is likely to result in a relic being discovered, exposed, moved, damaged or destroyed;



- e) disturbing or excavating a heritage conservation area that is a place of Aboriginal heritage significance;
- f) erecting a building on land on which a heritage item is located or that is within a heritage conservation area; and
- g) subdividing land on which a heritage item is located or that is within a heritage conservation area.

In addition, Council may not grant development consent without considering the effect the proposed development will have on the heritage significance of heritage item or heritage conservation area concerned.

Furthermore, in regards to Aboriginal heritage significance (Part 5.10.8) the consent authority must, before granting consent under this clause to the carrying out of development in a place of Aboriginal heritage significance:

- a) consider the effect of the proposed development on the heritage significance of the place and any Aboriginal object known or reasonably likely to be located at the place; and
- b) notify the local Aboriginal communities (in such way as it thinks appropriate) about the application and take into consideration any response received within 28 days after the notice is sent.

3. LANDSCAPE CONTEXT

3.1 Environment Locality

The Project Area consists of series of roughly east flowing drainage systems including the upper tributaries of Sugarmill Creek (Moonee); Pine Brush Creek (Korora) and Jordans Creek (Korora). The escarpment to the west includes Sealy Lookout (approximately 300m asl), Bruxner Gap (approx. 200m asl) and Coast Range. Most of the Project Area has been cleared for agriculture, horticulture or residential development.



3.2 Geology & Soils

The Geology of the Project Area is uniform- being part of the broad 'Coramba Beds' which are typical of the region north of Coffs Harbour. The Coramba beds date to the Carboniferous period and include Greywacke, Slate and Siliceous argillite (a metamorphosed volcanic).

The majority of the Project Area is located within the Megan landscape (Milford 1999: 66) which are described as "Rolling low hills to hills on Late Carboniferous metasediments of the Coffs Harbour association in the Coast Range and Gleniffer-Bonville Hills. Local relief to 90 m, occasionally to 200 m; slopes typically 5 - 20%, occasionally to 33%; elevation to 317 m. Partially cleared, tall open-forest and tall closed- forest" Milford 1999:96). Soils are typically "moderately deep to deep (>100 cm), well-drained structured Red Earths (Gn3.11), Brown Earths (Gn3.21), Brown Podzolic Soils (Db4.11) and Red Podzolic Soils (Dr2.11), with moderately deep to deep (>100 cm), structured Yellow Earths (Gn3.21; Gn3.71) and Yellow Podzolic Soils (Dy4.11) in drier situations, and moderately deep to deep (>120 cm), well-drained Krasnozems (Gn3.11; Gn3.14) in the moistest sites" Milford 1999:96)

Other landscape types in the Project Area include;

Bobo being "very steep to precipitous hills on late Carboniferous metasediments of the Coffs Harbour association in the Coast Range and Great Escarpment. Local relief to 260 m; slopes >50%; elevation up to 590 m. Partially cleared, tall open and tall closed-forest" (Milford 1999:176). Soils are typically "moderately deep, weakly structured Red Earths (Gn3.11, Gn4.11), with deep, imperfectly drained Red Podzolic Soils (Dr2.11) on footslopes and very shallow, well-drained Lithosols (Um1.23) on very steep slopes with shallow soils" (Milford 1999:176).

Moonee being "undulating rises, footslopes and drainage plains adjacent to steeper low hills and hills on Carboniferous metasediments of the Coffs Harbour association in the Coast Range and Gleniffer Bonville Hills. Local relief <30 m; slopes typically 3- 5%, occasionally 10%; elevation <20 m. Extensively cleared, tall open-forest and tall closed-forest" (Milford 1999:93). Soils are typically "Moderately deep to deep (>100 cm), poorly drained Humic Gleys (Uf6.41; Gn3.91) (Milford 1999:93).

Suicide being "steep hills and dissected valleys on Late Carboniferous metasediments of the Coffs Harbour association along the Coast Range. Local relief 100 - 300 m; slopes 33 - 56%; elevation up to



590 m. Partially closed and tall closed-forest” (Milford 1999:50). Soils are typically “moderately deep to deep (>100cm), well- drained, stony structured Yellow Earths (Gn3.71) on crests and upper slopes, with stony Lithosols (Um1.41) and structured Red Earths (Gn3.11) on mid-slopes and footslopes.” (Milford 1999:50)

Ulong being Landscape— undulating to rolling low hills on Late Carboniferous metasediments of the Coffs Harbour association in the Coast Range and Gleniffer-Bonville Hills. Local relief to 90 m; slopes 5 - 20%, occasionally to 33%; elevation to 360 m. Partially cleared, tall open- forest and tall closed-forest” (Milford 1999:75). Soils are typically “moderately deep to deep (>100 cm), well- drained structured Red Earths (Gn3.11), Brown Earths (Gn3.71), Red Podzolic Soils (Dr4.11) and Yellow Podzolic Soils (Dy2.12), plus deep (>150 cm), well- drained Krasnozems (Gn3.21; Gn3.14) in moistest areas, and moderately deep (>100 cm), imperfectly-drained structured Yellow Earths (Gn3.71) and Yellow Podzolic Soils (Dy2.21; Dy2.41; Dy4.21) in drier areas” Milford 199:750

3.3 Vegetation

3.3.1 *Megan Landscape*

Based on descriptions of undisturbed areas of forest the following model is proposed for the Megan Landscape;

“Mostly uncleared, tall open-forest in the north and tall closed-forest in the south. Because of climatic variation, the native vegetation varies markedly from north to south across this landscape. Tall open-forest (wet sclerophyll forest) dominated by tallowwood (*Eucalyptus microcorys*) and Sydney blue gum (*E. saligna*) [Forest Types 46 and 47] occurs extensively on crests and slopes. The drier exposed crests are occupied by tall open-forest dominated by narrow leaved white mahogany (*E. acmenoides*), spotted gum (*Corymbia maculata*), grey ironbark (*E. paniculata*) and small-fruited grey gum (*E. propinqua*) [Forest Types 60 and 74]. Moderately sheltered valley floors are dominated by brush box (*Lophostemon confertus*) [Forest Type 53] with a dense rainforest understorey, whilst the most sheltered gullies harbour various types of depauperate rainforest. Common dominant species include hoop pine (*Araucaria cunninghamii*) [Forest Type 21], yellow carabeen (*Sloanea woollsii*), crabapple (*Schizomeria ovata*), sassafras (*Doryphora sassafras*), corkwood (*Calcdcluvia paniculosa*) and silver sycamore (*Cryptocarya glaucescens*) [Forest Type 2/3], and sassafras, = fig, e.g., Moreton



Bay fig (*Ficus macrophylla*) , giant stinging tree (*Dendrocnide excelsa*) and grey myrtle (*Backhousia myrtifolia*) [Forest Type 6/23]. The boundary between tall open-forest and tall closed-forest on lower valley sides is often abrupt and pronounced. Rainforest becomes more prevalent towards the south, becoming dominated by black booyong (*Argyrodendron actinophyllum*), coachwood (*Ceratopetalum apetalum*) and crabapple (*Schizomeria ovata*) [Forest Type 5/11], with species such as tallowwood (*E. microcorys*), blackbutt (*E. pilularis*) [Forest Type 36], Sydney blue gum (*E. saligna*) [Forest Types 46 and 47] and brush box (*Lophostemon confertus*) [Forest Type 53] persisting on more exposed north-facing slopes. (Millford 1999:63-64)

3.3.2 *Bobo*

Based on descriptions of undisturbed areas of forest the following model is proposed for the Bobo Landscape;

Partially cleared, tall closed-forest grading to tall open-forest on more exposed crests and north-facing slopes. On steep to very steep valley sides, a tall open-forest (wet sclerophyll forest) exists dominated by narrow-leaved white mahogany (*Eucalyptus acmenoides*), red mahogany (*E. resinifera*) , small-fruited grey gum (*E. propinqua*) and grey ironbark (*E. paniculata*) [Forest Type 60], and tallowwood (*E. microcorys*) and Sydney blue gum (*E. saligna*) [Forest Types 46 and 47]. The drier north-west facing slopes are occupied by a tall open-forest (dry sclerophyll forest) dominated by small-fruited grey gum (*E. propinqua*), grey ironbark (*E. paniculata*) , white mahogany (*E. umbra* ssp. *carnea*) and narrow-leaved white mahogany (*E. acmenoides*) [Forest Type 62], whilst in sheltered valley floors is found a tall closed-forest (depauperate dry rainforest) dominated by hoop pine (*Araucaria cunninghamii*) [Forest Type 21]. The most sheltered, moistest gullies harbour localised patches of tall closed-forest (subtropical rainforest) dominated by corkwood (*Caldcluvia paniculosa*) , crabapple (*Schizomeria ovata*) , yellow carabeen (*Sloanea woollsii*), sassafras (*Doryphora sassafras*) and silver sycamore (*Cryptocarya glaucescens*) [Forest Type 2/3] Millford 1999:176)

3.3.3 *Moonee*

Based on descriptions of undisturbed areas of forest the following model is proposed for the Moonee Landscape;



Extensively cleared, tall closed-forest and tall open-forest generally replaced by native and improved pastures. In the southern parts, the tall closed-forest was dominated by species from both subtropical and warm temperate rainforest, including black booyong (*Argyrodendron actinophyllum*), coachwood (*Ceratopetalum apetalum*) and crabapple (*Schizomeria ovata*) [Forest Type 5/11], various *Ficus* species, giant stinging tree (*Dendrocnide excelsa*) and various species of myrtle [Forest Type 6/23]. Towards the northern parts, tall open-forest (wet sclerophyll forest) species become more dominant, including Sydney blue gum (*Eucalyptus saligna*), tallowwood (*E. microcorys*) [Forest Type 47], and narrow-leaved white mahogany (*E. acmenoides*), red mahogany (*E. resinifera*), grey ironbark (*E. paniculata*) and small-fruited grey gym (*E. propinqua*) [Forest Type 60] (Milford 1999:93)

3.3.4 *Suicide*

Based on descriptions of undisturbed areas of forest the following model is proposed for the Suicide Landscape;

Partially cleared, tall closed-forest grading to tall, open- forest on more exposed crests and north facing slopes. Tall closed-forest (subtropical rainforest) dominated by black booyong (*Argyrodendron actinophyllum*), coachwood (*Ceratopetalum apetalum*) and crabapple (*Schizomeria ovata*) [Forest Type 5/11] occupies the most favourable locations on lower slopes and valley floors, with hoop pine (*Araucaria cunninghamii*) [Forest Type 21] and brush box (*Lophostemon confertus*) [Forest Type 53] often found growing along its margins. Tall closed-forest (depauperate subtropical rainforest) dominated by various figs (*Ficus* spp.) , giant stinging tree (*Dendrocnide excelsa*) and myrtle [Forest Type 6/23] occurs in moderately favourable positions on less sheltered lower slopes. Upslope, tall open-forest (wet sclerophyll forest) dominated by tallowwood (*Eucalyptus microcorys*) and Sydney blue gum (*E. saligna*) [Forest Type 47] is common, grading to tall open-forest (dry sclerophyll forest) dominated by blackbutt (*E. pilularis*) [Forest Type 37] on ridges and north-facing upper slopes. (Milford 1999:50)

3.3.5 *Ulong*

Based on descriptions of undisturbed areas of forest the following model is proposed for the Ulong Landscape;



Tall closed-forest, grading to tall open-forest on more exposed crests and north-facing slopes, particularly towards the northern range of this landscape. The drier exposed crests in the far north are occupied by a tall open-forest dominated by blackbutt (*Eucalyptus pilularis*) [ForestTypes37and38], spotted gum (*Corymbia maculata*), grey ironbark (*E. paniculata*) and small-fruited grey gum (*E. propinqua*) [Forest Type 74]. A tall open-forest (wetsclerophyll forest) dominated by tallowwood (*E. microcorys*) and Sydney blue gum (*E. saligna*) [Forest Types 46 and 47] becomes more prevalent on slopes to the south, with occasional slopes dominated by flooded gum (*E. grandis*) [Forest Type 48]. Sheltered valley floors are dominated by brush box (*Lophostemon confertus*) [Forest Type 53], along with other tree species plus a dense rainforest understorey, whilst the deepest, most sheltered gullies harbour tall closed-forest (depauperate subtropical rainforest). Dominant species include black booyong (*Argyrodendron actinophyllum*)

3.4 Historic Aerial photos

3.4.1 1954/56

The historic aerial images from the mid 1950's are not complete- however it is possible identify the extent of land clearing for horticulture that had taken place prior to 1956 (Figure 41 and Figure 42). The aerial images show that most of the northern slopes in the Korora Basin have been cleared with established vegetation on the southern aspects of most ridgelines and some lower alluvial areas. Whilst the resolution of the images is not perfect it does not appear that there are a significant number of dams – however most of the access tracks and roads present today are visible. There are many residential and farm buildings present. The largest section of what appears to intact or regrowth bushland is located south of Maccues Road. The study area at Tiki Road is almost completed regrowth or intact forest.

3.4.2 1969

The 1969 historic aerial shows an overall intensification of the horticulture industry with many additional tracks and access ways through the banana plantations (Figure 43). Whilst there has been some breakup of forests in the lower slopes and alluvial areas the overall pattern remains of forested upper southerly slopes and ridgelines. The large forest area south of Maccues road shows some clearing throughout-



especially in the south western section. The Tiki Road section remain intact forest. One noticeable change is the development of nearby Moonee beach from just a caravan park to what appears to be a small village.

3.4.3 1979

The 1979 aerial image shows a similar pattern of intensification of the banana industry and a gradual breaking up of the large forest in the north of the Study Area (Figure 44). Forested ridgelines are visibly more prominent as small stands or patches of mature forest have been removed. Several larger dams are visible and many more residential dwellings are present in the eastern lower areas. The development of Korora, Sapphire Beach and Moonee Beach into residential areas is notable. The Tiki Road area remain intact or regrowth forest.

3.4.4 1989

The 1989 image shows a significant increase in what appears to be residential development across the entire Study Area (Figure 45). This includes the development of townships along the coastline just outside the Study Area. The large areas of forest near Moonee Beach have been significant affected during this period with what appears to be a rural residential development and there are many new residential houses on the major roads in the Korora Basin. The Tiki Road portion of the Study Area has also been partially cleared.

4. DATABASE SEARCHES.

4.1 The OEH Aboriginal Heritage Information Management System (AHIMS)

Care should be taken when using the AHIMS database to reach conclusions about site prevalence or distribution. For example, a lack of sites in a given area should not be seen as evidence that the area was not occupied by Aboriginal people. It may simply be an indication that it has not been surveyed, or that the survey was undertaken in areas of poor surface visibility. Further to this, care needs to be taken when looking at the classification of sites. For example, the decision to classify a site an Open Campsite containing shell rather than a Midden can be a highly subjective exercise, the threshold for which may vary between archaeologists.



A search was conducted on 5 August 2015 of the OEH Aboriginal Heritage Information Management System (AHIMS service number 184338) the Project Area (Table 1 and Figure 3). The search returned a total of nine (9) listings for Aboriginal Cultural Heritage sites within the Project Area. All of the recorded sites within the Project Area are open sites- being either artefact scatters with overall low density of artefacts or isolated finds. The recorded sites are located on lower valleys and slopes in the eastern section of the Project Area- with the exception of Korara 2 and PAD which is located off a relatively large ridgeline approximately 75 masl and therefore possibly mapped inaccurately. The AHIMS entry does not include any report or permit reference numbers to confirm the accuracy of this site.

The AHIMS search indicates that the following sites have been destroyed (#22-1-0212 S2W-2; #22-1-0399 Sartour OS 1 and #22-1-0400 Sartour ISO 2) and subject to a permit (#22-1-0085 Diggers Beach 2 permit no. 1128; #22-1-0192 Sapphire One permit no. 1986) which may have involved relocation.

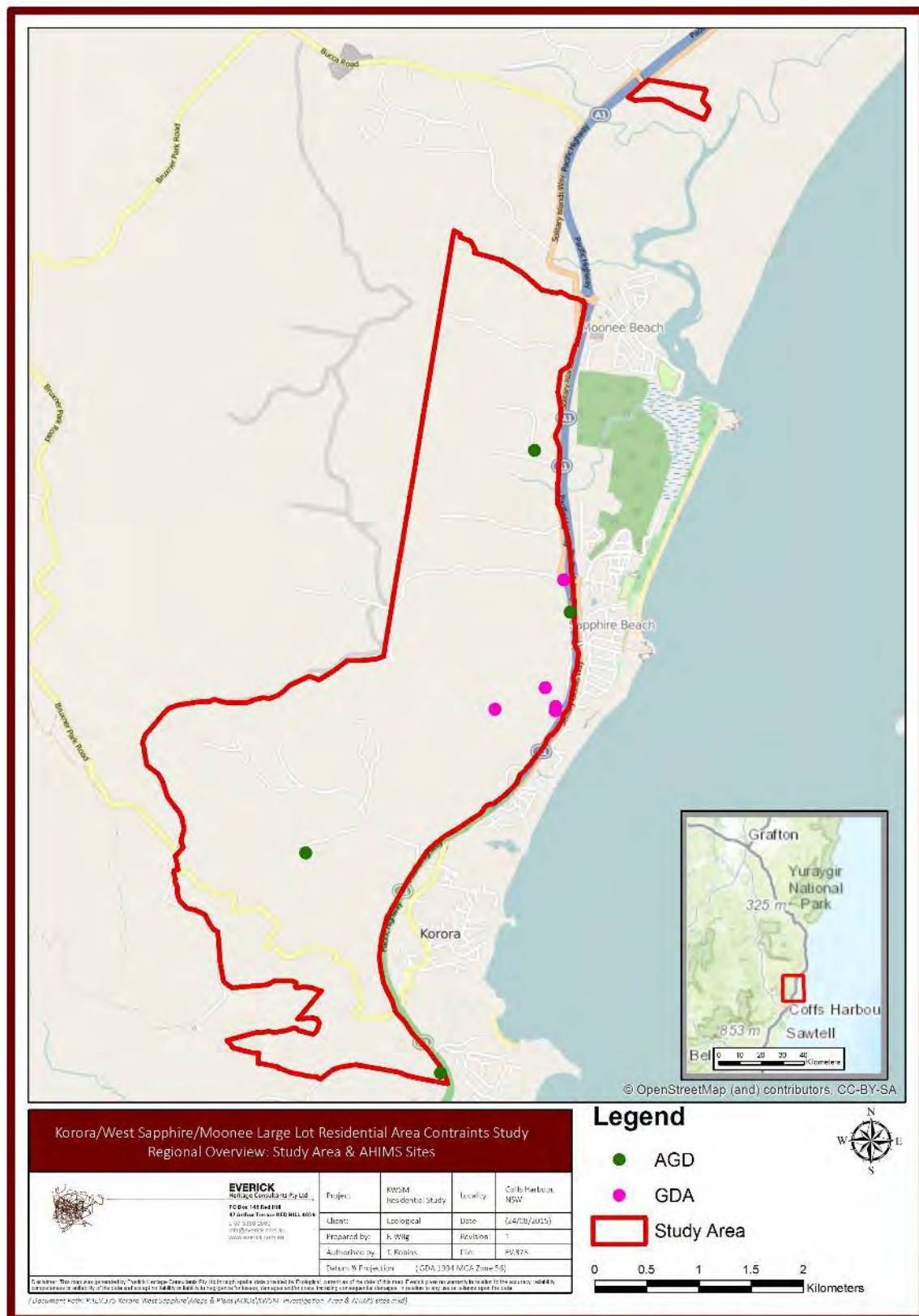


Figure 3: Recorded Aboriginal sites in the Project Area

**Table 1: AHIMS Search Results**

<i>Site Number</i>	<i>Name</i>	<i>Easting</i>	<i>Northing</i>	<i>Site 'Features'</i>
22-1-0212	S2W-2	514083	6655959	Open site/ artefact (4)
22-1-0364	Korara 2 and PAD	513424	6654719	Artefact (1) and PAD
22-1-0391	S2W-20	514000	6654705	Open site/ Artefact (1)
22-1-0399	Sartor OS1	513905	6654924	Artefact (1)
22-1-0400	Sartor ISO 2	514004	6654746	Artefact (1)
22-1-0085	Diggers Beach 2	512900	6651220	Open Site/ Artefact (1)
22-1-0143	CHSS-2	513800	6657190	Open Site/ Artefact (3)
22-1-0192	Sapphire One	514145	6655639	Open Site/ Artefact (4)
22-1-0301	Finlays Road	511608	6653331	Open site/ Artefact (1)



4.2 Other Heritage Registers: Aboriginal & Historic Cultural Heritage

The following heritage registers were accessed on 5 August 2015:

The National Heritage List (Australian Heritage Council): Contains no Aboriginal heritage listings within the Project Area.

Commonwealth Heritage List (Australian Heritage Council): Contains no Aboriginal heritage listings within the Project Area.

Register of the National Estate (Australian Heritage Council): Contains no Aboriginal heritage listings within the Project Area.

The State Heritage Register (NSW Heritage Office): Contains no Aboriginal heritage listings within the Project Area.

The State Heritage Inventory: Contains no Aboriginal heritage listings within the Project Area.

The Register of the National Trust of Australia: Contains no Aboriginal heritage listings within the Project Area.

Coffs Harbour Local Environment Plan 2013 (LEP): Contains no Aboriginal heritage listings within the Project Area.



5. ARCHAEOLOGICAL SYNTHESIS AND PREDICTIONS

5.1 European History of the Korora West Sapphire Moonee.

The first historical documents relating to the Coffs Harbour area were the naming of the 'Solitary Islands' by James Cook in May 1770, with additionally mapping by Matthew Flinders in 1779. However, despite the early records from 1791 of two runaway convicts William and Mary Bryan and their two children running away to the area, it was not until 1847 that the next record of the settlement exists, with Captain John Korff taking shelter at the southern Headland of the now 'Coffs Harbour'. European settlement of the area was relatively late compared to the Bellinger and Clarence Rivers;

There was at least some cedar getting at Coffs Creek by Walter Harvie and George Tucker in 1865, with the camp set up by Harvie and Tucker being one of the earliest known semi-permanent settlements in the Coffs Harbour area. Timber getters often employed the services of Aboriginal bushmen who had the knowledge and skills to rapidly identify Cedar trees. (Thomas 2013:2)

The township of 'Woogoolga' was first gazetted in 1888, (subsequently changed to Woolgoolga in 1966) following initial settlement in the 1870's. Three major phases of settlement themes can be defined within the Coffs Harbour area which have had cumulative impacts within the general Study Area, being;

Forestry and forest related industries: This phase of settlement includes the very early extraction of cedar and later more broad extraction of remaining eucalypt species. This later process of clearing has historic linkages to the settlement of the area post World War 1 and the clearing of land by returned soldiers for early agriculture and horticulture.

Horticulture and agriculture: Farming has played an important role in the study area and has had the most significant impact on the physical landscape. Large areas of land have been cleared and regrowth managed for grazing and horticulture. Significant early crops include bananas, sugar cane and pineapples. Some agricultural diversification has taken place, and contemporary land use includes blueberries, aquaculture and nuts (macadamias particularly). A number of market gardens have operated within the area and are consistent with the historical process of dividing agricultural land into



smaller lots as the wider district population increases. This phase has had the most significant historical effects on the Project Area.

Mining: Old parish maps document the Orara Gold Field as being proclaimed in 1881 and covered part of the Study area. Two historic mines are known in the Project Area- being the Sea Breeze (circa 1938) and Golden Arrow (circa 1931-33) mines. These mines produced 652 and 248 ounces of gold respectively.

(http://www.treasureenterprises.com/gold%20prospecting%20information/gold_prospecting_locations_new%20south%20wales.htm). Compared to other industries mining has had a very small physical impact on the landscape and potential heritage values.

Residential development: This process of urbanisation has increased significantly since the 1980's and is most noticeable around the small coastal settlements such as Moonee. This urbanisation has mostly been contained within areas already cleared as a result of forestry and horticulture, however has significantly changed water courses and drainage. Rural residential development of the 'hinterland' areas to the west of the Pacific Highway has had a lesser impact on heritage values than the higher density development typically of areas east of the Highway. A key element of the process of urbanisation in the Project area has been the establishment of 'holiday villages' - such as Moonee Beach- typified by small fishing huts and campgrounds which became popular post World War Two and especially in the 1960's.

5.2 Aboriginal History

The study area is located within the Gumbayngirr Nation/Language Area which is broadly known to include the lands north of Nambucca Heads, south of the Clarence River and west up to the Great Dividing Range (Thomas 2013:1). Many of the Place Names within the Study Area are known to be derived from Gumbayngirr names- often associated to species which were locally abundant in the area. These include Moonee which is understood to be derived from the word "Munee- a paddymelon. Moonee Moonee meant plenty of paddymelons (a small wallaby found here in great numbers by early settlers). (GNB 159)"

(http://www.gnb.nsw.gov.au/place_naming/placename_search/extract?id=anwGWyrXKW) and Bucca which is understood to be derived from the Gumbayngirr word "Crooked, or, crooked creek. (Reed,



1969)" (http://www.gnb.nsw.gov.au/place_naming/placename_search/extract?id=KWwGvqsyIt).

However- the most comprehensive historical account of Aboriginal place names (Ryan 1964) assigns no names to Coffs Harbour, Korora or Sapphire and assigns the term Moonee to the Nambucca Valley (however does translate the term to Paddymelon) (Ryan 1964:24). Ryan (1964:29) does however provide an interpretation of the names for South Solitary and North Solitary Islands (Boonyoongoody and Atoonda respectively) to the Woolgoolga area. Following on from this account it is obvious that his source was from the Woolgoolga area- which accounts for the lack of place names assigned to Coffs Harbour.

Estimates of the numbers of Aboriginal people at the period of first settlement has been critical to understanding the indigenous history of north-eastern New South Wales. Given the problematic nature of population estimates, the latter and more 'general' observations of Mathews (1898:66) which simply concluded that "hunting grounds would be comparatively small" in the coastal districts is more useful than heavily qualified estimates which infer 'carrying capacity'- as was the thinking in the late 1800s/

Radcliffe Brown (in Lane 1970:V.8) concludes for the coastal areas that population densities would be in the order of 'one person to every three square miles'. Estimates of tribal groups in the order of 200 individuals are relatively common amongst ethnohistoric and anthropological literature (ie. Lane 1970 for the Nambucca River district immediately south). An additional element to this discussion of population density is the differentiation of the coastal and escarpment areas where it is generally accepted had lower and much more mobile Aboriginal populations. For the larger River systems (Nambucca, Clarence and Macleay) the concept of more intensive use of the coast as compared to the up-river and escarpment is generally accepted (i.e McBryde 1974, Godwin 1990).

However, a uniqueness of the Coffs Harbour area is the close proximity of the Great Dividing Range to the Coast. No other 'district' on the North Coast has such a narrow coastal zone, or such a short distance between the very different environments of coast and elevated/cold forests, and no significant River system. There is however great potential for pathways and routes between the coast and escarpment/hinterland however, these are not necessarily represented archaeologically through the discard of Aboriginal Objects or noted in early ethnohistorical accounts. Any observations from the relatively late settlement of the Coffs Harbour area would also be biased as Gumbayngirr people



generally would have had some 25 years of contact with European settlers by the time detailed records of Aboriginal life in Coffs Harbour were produced.

The relatively limited amount of ethno historical information available for Coffs Harbour has been collated for the Coffs Harbour by-pass project which is focussed on the edge of the Coffs Harbour escarpment and therefore an analogous environment to the Study Area (Connell Wagner 2004). This report surmises that;

“Away from the immediate coast shifting camp seems to have been frequent, “occurring about monthly as the game in the immediate vicinity became exhausted ... it took several months to give each ground in the locale its turn” (McFarlane 1934-5). Base camps were established in areas protected from the elements by dense vegetation (McFarlane 1934-5). According to Dawson (1935), “the middle of each day was spent around the fire where the venison or game was procured, and the remnant of the meal... was carried back to camp for evening consumption” (Connell Wagner 2004:5).

The study suggests that a mode of occupation focussed around ‘base camps’ which provided a degree of protection from the elements surrounded by a series of smaller ‘resource-specific’ sites in between. The study places populations (in terms of size of group per camp) at 50 with groups as large as 200 recorded at Sawtell/ Bonville Creek. The study (Connell Wagner 2004:6) also makes specific reference to the sub-coastal area- indicating that permanent occupation of these areas was rare- with use being typically during travel to another location:

“At Karangi 4km inland of the options corridors, for example, there were few Aborigines (Kelly 1987), although many passed through “on their way to somewhere else” (Secomb 1986:46)”

Historic camps in the Coffs Harbour area tended to be on Public land and nearby to small townships where there was access to water either naturally occurring or at a public tap. The main camping areas identified by Goulding (2001:64,65) area Corindi Lake, inland from Arrawara, Nana Glen (junction of Orara River and Bucca Bucca Creek), Happy Valley in Coffs Harbour, Coffs Creek/Fitzroy Oval, Wongala Estate and Yellow Rock. Generally speaking the historical experiences of Aboriginal people has been one of exclusion up until the 1960’s (i.e Calley 1956:201). The nature of historic Aboriginal camps and



economy within the historic period is such that it is unlikely these types of 'sites' will be present in the historic record of the study area. The Connell Wagner study of the Coffs bypass identified that the majority of historic Aboriginal camps were on Crown Land within 1 or 2km of the coastline- however noted that Aboriginal people were regularly employed on two banana plantations at Bruxner Park in the 19540's and 1950's (Connell Wagner 2004:6). The authors make one specific reference to the 'Ferguson Camp' at Korora:

"Throughout the 1940's and 1950's, an Aboriginal camp (known as Ferguson's camp) was occupied at Bunnies Beach, Charlesworth Bay. Aboriginal people from this camp regarded Jordans Creek as an important resource collection area (Connell Wagner 2004:6).

5.3 Relevant archaeological and Cultural Heritage Assessments

5.3.1 *Woolgoolga to Sapphire Highway Upgrade*

The only major archaeological assessment within the Study Area relates to the Sapphire to Woolgoolga Highway upgrade (Collins 2007). This study identified seven archaeological sites and eight areas of potential archaeological deposit (PADs). The confirmed sites comprise four scatters of stone artefacts (S2W-2, 4, 7 and 12) and three isolated artefact finds (S2W-3, 5 and 6). The study also identified a potential historic Burial near Moonee (Portion 41) which could not be specifically located. This burial may exist with the Study Area. Whilst the overall sample (number) of recorded sites was small the results provide an indication of the types of sites which would be expected even 1 or 2 km west of the coastline and complex estuary/ lake systems- being open stone artefact scatters and open campsites.

5.3.2 *Coffs Harbour Highway Bypass*

The Connell Wagner assessment of the Coffs Harbour bypass- although south of the Study Area- is a useful reference document as it is in a roughly analogous environmental landscape. This report concluded;

For the most part, the two Inner Bypass options traverse a highly disturbed landscape that offers little potential for the preservation of in situ Aboriginal archaeological sites. A number of specific areas where archaeological potential is assessed to be moderate or high have been identified, but no archaeological sites are currently known on either option. Two stone



artefacts have nevertheless been recorded within 50m of the options' common southern end, presenting the possibility that similar materials may be intercepted by the options themselves. The areas of predicted archaeological sensitivity are predictions only and require field testing. Even though there are currently no Aboriginal cultural heritage constraints to development of either option, this situation could change if a significant site is detected during future field survey. (Connell Wagner 2004:18)

5.3.3 *Coffs Harbour- Urunga Forestry Management Areas*

The Coffs Harbour- Urunga Forestry Management study provides the most comprehensive regional assessment of the archaeological values and potential of the Coffs Coast hinterland. The study included parts of Orara East State Forest- and whilst it is acknowledged that the sub-coastal zone which comprises the Study Area is was not included within the Davies study some of its findings have practical application for future Due Diligence studies regionally as the study was structured around 'landsystems' (Davies 2003). Overall the sampling strategy was biased towards the location of open campsites, stone artefact scatters and isolated finds- however found a strong correlation between the amount of slope and the sandiness of soils (Davies 58-59). The Study concluded that the majority of sites occurred on the crests of spurs in areas which would have been dry sclerophyll forest. Regionally the majority of sites in the area were associated with the dissected escarpment and ranges with relatively few sites found on near coastal low hills and rises. However, the study found that whilst site 'density' was greater in the escarpment area the number of artefacts per site was much lower. This finding supports a model of greater mobility through the escarpment and a relative absence of permanent camps when compared resource rich marine and estuarine areas of the coastline.

5.3.4 *The Lakes Estate*

A series of archaeological investigations have been undertaken for the surround 'Lakes Estate' project (Bonhomme Craib and Associates 2011) to the south of the Study area in the North Boambee Valley. This study identified a number of stone artefact scatters within the surrounding areas (see Table 1) including site #22-1-0377. A total of 410 artefacts were recovered from 58.5m² of test-pit excavations (total 39 test pits). This study of #22-1-0377 concluded;



The landform types investigated during the sub-surface testing were the ridgecrest and upper slope. The stone artefacts were either coarse or fine grained siliceous material referred to locally as 'greywacke'. Stone artefact types were limited and consisted of cores (5), tools (1) with the remainder being debitage (98%) consisting of complete flakes, broken flakes, flaked pieces. One complete flake had evidence of retouch and is consisted a tool...

The density of artefacts across the south hill slope indicates that Aboriginal activity resulting in physical evidence (i.e. the presence of stone tools, hearths or other features or items) was low. The area may have been accessed regularly to procure resources but there is only a low level physical expression of these activities. The artefact clusters suggest that while artefacts were found there are two locations with material that suggests intense knapping was occurring (Bonhomme Craib & Associates 2001:24).

The relevance of this study to the Study Area primarily relates to the site being located within a land system of low rolling hills adjacent to a small coastal estuary (Newports Creek). The location of the site within land which has seen only low intensity agriculture is also directly relevant to the Study Area as typically such large sites are not expected to have survived in areas with more complicated land-use histories.

5.3.5 *North Coffs Harbour Release Area*

The North Coffs Harbour Release Area was subject to a similar archaeological assessment and is located immediately to the south of the current study (Hudson 2009). The study includes the area north of the North Coast Railway Line, east of the Pacific Highway and south of the proposed Coffs Harbour bypass. The effectiveness of the survey was significantly constrained due to vegetation growth, however no Aboriginal sites were recorded. Several trees with indicative marks from historic logging ('board notched stumps') were recorded as evidence of historic European occupation- however these were not identified as being significant.

5.3.6 *Godwin (1990) regional synthesis of ethno-historical information*

The most comprehensive 'regional' model for the area is provided by Godwin (1990) in a major review of the earlier archaeological research of Isabelle McBryde. Godwins model specifically investigates



patterns of movement between the coastal, sub-coastal and tablelands (escarpment) areas. However the applicability of this model to the Coffs Harbour area is problematic as the tablelands/escarpment intrudes so much in to the coastal zone. For the purposes of understanding the archaeological record the study area is considered to fall into the 'coastal' area.

Amongst coastal groups proper there was no movement from the coast back into the sub-coastal river valleys and foothills. These people were semi-sedentary and lived close to the coast the whole year round. Movement associated with the subsistence round involved travelling only short distances away from the littoral. There were instances of long distance travel associated with ceremonial gatherings. However, such movement was generally parallel to the coast (i.e. north-south along the coast rather than east-west from coast to hinterland). (Godwin 1990:122,123)

From the review of previous archaeological and cultural heritage assessments in Coffs Harbour and the broader regional locality noted specific environment contexts including floodplains, lowland hills, estuarine creek banks and coastal dunes, are likely to contain evidence of Aboriginal occupation.

5.3.7 *Woolgoolga to Ballina Pacific Highway Upgrade*

The recent archaeological assessment works for the Woolgoolga to Ballina Pacific Highway upgrade project provide the most significant 'recent' regional assessment of the archaeological of the North Coast subcoastal region. This study is included as an Appendix (12) to the Environmental Impact Assessment and was derived from the SKM (2012) study and is available at the following website address (<http://www.rms.nsw.gov.au/documents/projects/northern-nsw/woolgoolga-to-ballina/w2b-eis-chapter-12.pdf>).

The project developed a number of models based broadly on land system, landscape and landform (Table 2). For the Coastal Range Land System between Woolgoolga and Wells Crossing (immediately north of the Study Area) the predictive model indicates a moderate to high 'sensitivity rating' for sites such as isolated artefact scatters, stone artefact scatters and bora/ ceremonial rings.


Table 2: Woolgoolga to Ballina archaeological predictive model (from RMS 2012)

Project section	Land system	Specific landscape characteristics	Location within / near the project corridor	Landforms with high probability of Aboriginal sites	Sensitivity rating	Likely site types	Factors influencing occurrence
1	Coastal plain	Relatively flat plain behind dune barrier on coast, with depressions comprising brackish lagoons, swamps and marshes.	Arrawarra and south of Corindi, Wells Crossing, Halfway Creek, ending around Dirty Creek.	Any raised areas.	Moderate	Isolated stone artefacts and small stone artefact scatters, shell middens.	Infilling from aeolian dune mobility, aggrading alluvium, and colluviums may have concealed sites and even sensitive landforms.
1, 2, 3	Coastal range	Ridgelines dissected by ephemeral and permanent waterways and small river valleys. Overlooking coastal plain and swamps.	Wells Crossing, Halfway Creek, ending around Dirty Creek. Includes Dirty Creek Range (also known as Coast Range).	Close to freshwater sources on locally elevated well-drained land. Would have formed walking paths between coastal and inland resources.	Moderate	Isolated stone artefacts and small stone artefact scatters.	Relatively shallow soils have limited potential for stratified and in-situ deposits due to post-contact land use.
1,2		Foot slopes and spurs of range adjacent valley flats. Gradients are generally gentle and elevation less than 40 m above sea level.	Dirty Creek, Corindi and Arrawarra.	Flat, low spur crests near substantial creeks and resource-rich swamps.	High	Small and more substantial stone artefact scatters, bora/ceremonial rings.	Relatively shallow soils have limited potential for stratified and in-situ deposits due to post-contact land use.
1		Broad alluvial valley flats.	Corindi River, Dirty Creek.	Flat alluvial terraces near substantial creeks, rivers and resource-rich swamps. Burials may occur in deep alluvial deposits.	Moderate-High	Small and more substantial stone artefact scatters, burials, bora/ceremonial rings.	Aboriginal sites may be concealed by aggrading alluvium.

5.4 Potential Site Types

The desktop review has identified a potential for archaeological materials to be within the Study Area prior to European settlement. The following types of archaeological sites are expected to occur within the Study Area.

5.4.1 Isolated Artefacts

These will consist of single stone artefacts, which may have been randomly discarded or lost. They may occur in almost any environmental context exploited by Aboriginal people. They are commonly stone axes, single cores, hammer stones, pebbles, flakes and grinding stones and/or grooves. Their presence may indicate that more extensive scatters of stone artefacts exist or existed nearby, perhaps obscured by vegetation or dispersed by mechanical means.



5.4.2 *Open Campsites/Artefact Scatters*

Open campsites/artefact scatters generally consist of scatters of stone artefacts and possibly bone and hearth features. Their exposure to the elements means that evidence of food resources used on the site (with the exception of shellfish) is usually lacking. An open campsite containing a large component of shell refuse may be described as a midden. They invariably consist of low or high density scatters of primary and secondary flakes in addition to the types of artefacts found as isolated finds. Open campsites may also contain burials when located on sand strata. Few open campsites are found on kraznozem and podzolic soils, possibly due to the destructive impacts of land clearing and the heavy vegetation cover. Detection is usually unlikely unless high degrees of surface visibility are present.

5.4.3 *Quarry Sites*

A stone quarry may occur where a source of opaline silica exists or other siliceous types of stone occur (e.g. chert, chalcedony and silcrete). The area can be identified by a number of different types of stone tools in various stages of production as well as refuse flakes. There is a moderate potential for quarry sites to be located in the Study Area.

5.4.4 *Scarred Trees*

Scarred trees result from the removal of bark for use as covering, shields, containers or canoes. No doubt, as an outcome of widespread intensive land clearing and natural causes very few have survived. There is a moderate potential for locate scarred trees in older and mature forests.

5.4.5 *Burials*

Human burials are typically individual or small group internments which can be found in sandy soil substrates, such as creek lines or within small rock crevices. Most of the known burials have been located by accidental means through mechanical disturbance or natural erosion. Given the underlying soils is not sandy, there is a low potential to locate Burials within the Project Area.

5.4.6 *Ceremonial Sites*

Ceremonial grounds are typically places identified by Aboriginal groups as places of importance which were visited by groups to mark or commemorate rites or other occasions. One such example is Bora



grounds, earthen mounds crafted in a circular formation which were used for the purposes of ceremonial practices. The potential for these types of sites to occur in the Study Area is considered to be low.

6. FIELD SURVEY: ABORIGINAL CULTURAL HERITAGE

6.1 Survey Methods

Given the scale of the study area and the methodological constraints identified by similar studies (i.e. Hudson 2009) the study methodology aimed to broadly understand the landscape in the context of the Due Diligence Code of Practice, and particularly Question 2b “Is the activity in an area where landscape features indicate the presence of Aboriginal cultural heritage?” The study included a vehicle-based visual inspection of the Study Area to document the characteristics of slope; aspect; disturbance and proximity to mapped creeks.

The second part of the methodology was to use digital models to define areas which met the criteria under the Due Diligence Code of Practice which would require additional investigation. These areas were mapped and compared to the areas identified as being available for access for fieldwork through land-owner support/ approval.

A third stage involved visual inspection of some properties within the Study area- however it should be noted that the efficiency of this survey stage was limited by access restrictions on private lands.

6.2 Constraints to Site Detection and Survey Coverage

An assessment of the constraints to site detection is made to assist in formulating a view as to the effectiveness of the field inspection to find Aboriginal sites and cultural materials. It also assists in the forming of a view of the likelihood of concealed sites, keeping in mind a site specific knowledge of the impacts that European land uses and natural processes may have had on the ‘survivability’ of Aboriginal sites in a Project area. The constraints to site detection are almost always most influenced by post European settlement land uses and seldom by natural erosion processes. The area of surface exposure and the degree of surface visibility within exposed surfaces are usually the product of ‘recent’ land uses



e.g. ploughing, road construction, natural erosion and accelerated (manmade) erosion (McDonald et al. 1990:92). In the context of the current study constraints have been documented in terms of general land-use across the study area.

6.3 Survey results and discussion

6.3.1 Initial landscape assessment.

An initial landscape assessment was undertaken which aimed to identify the broad landform characteristics of the Project Area. This stage utilised existing public access roads as a means to understand the nature of terrain and disturbance to assess the potential archaeological sensitivity of the Study Area.

<i>Road</i>	<i>Landscape characteristics</i>	<i>Land-use / disturbance</i>	<i>Sensitivity</i>
<i>Maccues</i>	Follows a moderately steep and narrow east-west ridgeline. Becomes progressively more steep to the west. Some lower slope ridges and areas of swamp/ wetland are present to the north and south.	Some areas of intensive horticulture however mainly existing rural residential and regrowth forests.	Moderate.
<i>Wakelands</i>	Follows a relatively low and broad ridgeline with numerous open paddocks and regrowth forest.	Agriculture/ horticulture and rural residential development	High
<i>Fairview</i>	Follows low ridges with moderate slopes with mostly open paddocks and regrowth forests.	Agriculture/ horticulture and rural residential development	High
<i>Sugarmill</i>	Moderately steep slopes and ridges (undulating) with increased slope profiles to the west.	Agriculture/ horticulture and rural residential development	Moderate



<i>Gaudrons</i>	Moderately steep to very steep slopes with increased slop profiles to the west associated with	Intensive horticulture (bananas) on steeper slopes.	Low-moderate
<i>Old Coast</i>	Moderate slopes in the east with increasingly steep slopes in the western sections and in parts crossing east-west ridgelines.	Agriculture/ horticulture and residential. Some regrowth forest throughout.	Moderate.
<i>Korora Basin</i>	Moderate slopes with some lower broad ridges and alluvial areas associated to Pine Brush Creek. Very steep slopes associated to the Korora Basin.	Agriculture/ horticulture and residential. Some regrowth forest throughout.	Moderate-High
<i>Finlays</i>	Low to moderate slopes and smaller broad ridges. Small creeks and alluvial areas in parts associated to Pine Brush Creek.	Predominately rural residential with some horticulture	Moderate-High
<i>Bruxner Park</i>	Moderate to very steep slopes and ridges associated to the Korora Basin. Very few low or broad ridges.	Predominately horticulture (Bananas and Avocados).	Low-Moderate
<i>West Korora</i>	Moderate to steep slopes with some lower ridges and alluvial areas in the east associated to a Jordans Creek.	Horticulture/ agriculture; some regrowth forest and residential.	Moderate.
<i>Tiki</i>	Flat open alluvial- possible swamp.	Rural residential and low intensity agriculture.	High.



Figure 4: Example of a small mid ridgeline/ PAD area on Maccues Road- showing disturbance from road and horticulture (far left)



Figure 5: Example of steeper slopes and ridges and horticulture in the upper slopes of Maccues Road



Figure 6: Example of moderately broad ridge and rural residential landscaping at Wakelands Road



Figure 7: Broad low ridges within the eastern section of Wakelands Road



Figure 8: Low flat areas of potential paperbark swamp in the eastern section of Wakelands Road.



Figure 9: Example of hoop- houses and regrowth forest on broad flat ridgelines on Sugarmill Road



Figure 10: Example of moderate to steep slopes towards the west of Sugarmill Road.



Figure 11: Example of low and broad ridges with very steep slopes in to the west (Gaudrons Road)



Figure 12: Example of very steep disturbed slopes on Gaudrons Road



Figure 13: Example of moderately steep ridgeline with mix of agricultural clearing and dense regrowth forest (Gaudrons Road)



Figure 14: Banana plantations on lower slopes (Old Coast Road)



Figure 15: Example of steeper slopes and ridges (Old Cost Road)



Figure 16: Example of intensive horticulture on moderate slopes (Old Coast Road)



Figure 17: Example of low broad ridgeline with residential development (Old Cost Road)



Figure 18: Example of small creek flat (Korora Basin Road)



Figure 19: Example of moderately step slopes and ridges (Korora Basin Road)



Figure 20: Moderately steep slope and narrow ridgelines (Rowsells Road)



Figure 21: Example of lower broad ridges (Finlays Road)



Figure 22: Example of alluvial creek flat (Finlays Road)



Figure 23: Example of broad lower slopes cleared for horticulture (Bruxner Park Road)



Figure 24: Very steep slopes in the upper catchment of Korora Basin (Bruxner Park Road)



Figure 25: Example of a narrow ridgeline in the middle Korora Basin (Bruxner Park Road)



Figure 26: View of Korora Basin lower slopes and ridgelines (Bruxner Park Road)



Figure 27: Small alluvial creek- bank (West Korora Drive)



Figure 28: Example of moderate slopes used for horticulture (West Korora Drive)



Figure 29: Mix of horticulture and regrowth forest (West Korora Drive)



Figure 30: Example of low flat cleared land at Tiki Road



Figure 31: Example of partially cleared paperbark and regrowth forest at Tiki Road



6.3.2 *Identification of PADs using slope*

A GIS mapping process was undertaken to identify PADs using slope and terrain mapping. This process was informed by the initial landscape inspection and aimed to map and define areas of ridgecrest which were both relatively flat and broad. These areas were mapped as individual polygons and labelled numerically.

The criteria for identification of PADs have been informed by the Due Diligence Code and include areas within 200m of a water body and ridgecrests. Based on the soils mapping no sand bodies were expected in the Project Area.

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Figure 32: Initial mapping of Potential Archaeological Deposits



6.3.3 *Property inspections*

Consent for access to private properties was provided and arranged at the following addresses;

- 153 Maccues Road Moonee;
- 45 Old Bucca Road Moonee;
- 75 Maccues Road Moonee and
- 264 The Mountains Way Sapphire Beach.

The property inspections were undertaken on the morning of 9 September 2015 by Senior Archaeologist Tim Hill. The property inspections aimed to identify Aboriginal sites and PADs and to generally validate the findings of the initial inspection with regard to verifying the nature of slope and disturbance and the effect of these on the archaeological record. Survey information from property inspections was undertaken with a field notebook and digital camera. Mapping information was accessed in the field from Google Maps and Google Earth accessed from a smart- phone. Property owners were available at 153 Maccues Road, 45 Old Bucca Road and 264 The Mountains Way to identify each property boundaries.

Access to several additional properties was possible- however it was determined that those additional properties either did not provide access to a significant size area for survey or were in areas which had been either heavily disturbed or on very steep slopes. There was a bias in property access towards the Sapphire and Moonee areas however this was not regarded as a significant constraint given that these areas were identified as priorities from the initial scoping study.

The following table summarises survey and environmental conditions for properties which were accessed by the Study (Table 3 see also Figure 33, Figure 34, Figure 35, Figure 36, Figure 37, Figure 38, Figure 39 and Figure 40);

**Table 3: Summary of field survey locations**

<i>Address</i>	<i>Environment</i>	<i>Slope and Aspect</i>	<i>Disturbance history</i>
153 Maccues Road	Predominately quite wet regrowth forest.	Moderately steep slopes with a south-easterly aspect.	Much of the forest is typically regrowth Eucalypt with a wet understorey. A large area is revegetating bananas.
45 Old Bucca Road	Open grassland	Low and broad north-west facing ridgecrest	The paddock appears to have been open grazing- there is no evidence of bananas. One large old board-notched- stump was identified indicating clearing pre-1950's.
75 Maccues Road	Mixed regrowth forest and revegetating banana.	Very steep- steep with south-easterly aspect	Much of the property appears to have been cultivated for bananas. The regrowth forest is restricted to the upper south facing slopes.
264 The Mountain Way	Mixed cleared paddock and regrowth forest.	Moderate south-easterly slope.	The north-western cleared paddock appears to have been cleared for grazing whilst the lower sections around the residence appear to be partial regrowth forest. The lower section has a lot of introduced plant species.



Figure 33: Looking south across old banana fields 75 Maccues Road



Figure 34: Looking east across old banana field 75 Maccues Road



Figure 35: Looking south across broad ridge crest 45 Old Bucca Road



Figure 36: Looking north along broad ridge crest 45 Old Bucca Road



Figure 37: Looking west across revegetating forest 153 Maccues Road



Figure 38: Looking south at revegetating banana field 153 Maccues Road



Figure 39: Looking south across cleared horse paddock 264 The Mountain Way



Figure 40: Looking east across regrowth forest 264 The Mountains Way



7. RESULTS AND DISCUSSION

7.1 Results.

Based on the investigations undertaken as part of the Study it is possible to identify the following results:

7.1.1 *Aboriginal Places*

There are no gazetted Aboriginal Places or Listed Historic Heritage items within the Project Area.

7.1.2 *Historic heritage items*

There are no declared historic heritage items

7.1.3 *Potential Archaeological Deposits*

A total of 38 PADs were mapped within the Study Area. This process allowed the identification of several 'trends' of relevance to the project, being;

- A high correlation between known sites and PAD areas;
- A trend towards great frequency of PAD areas to the east of the Project Area;
- A trend towards larger PAD areas to the north of the Project Area;
- An overall trend of roads and existing dwellings being located on PAD areas leading to significant disturbance;
- A relatively low number of PADs which are considered 'undisturbed'

7.1.4 *Property inspections*

No archaeological sites were identified during the property inspections. Generally speaking only one of the properties (45 Old Bucca Road) provided access to what could be considered a PAD with a high potential to contain Aboriginal sites. In this property grass cover was such that visibility was significantly restricted.



7.2 Discussion

The results of the study identify several broad patterns which are interrelated. The Korora Basin is a significant topographic feature within the Project Area and is defined by very steep slopes and narrow ridgelines and a network of moderately steep to gentle slopes and ridges dissecting small alluvial areas associated with Pine Brush Creek. The steepness of the terrain and proximity to Coffs Harbour CBD has resulted in the Korora Basin having a relatively greater level of historical disturbance when compared to areas to the north of the Project Area.

The number of recorded Aboriginal sites is likely the result both of increased survey effort associated with developments requiring consent on the lower slopes as well as the greater likelihood that the lower slopes and wetlands were used in preference to the steeper slopes of the Coast Range for occupation by Gumbayngirr people. The eastern areas of the Project Area would have offered greater access to resources and landforms more conducive to seasonal camps when compared to the steeper slopes which would have been dominated by rainforest and tall wet forests. It should be noted that none of the previously recorded sites constitute what could be considered 'large site complexes' which characterise the coastal strip north of Coffs Harbour. None of the known sites had greater than 4 artefacts and most were Isolated Artefacts indicating an overall pattern of relatively low population densities across the Project Area. An alternative explanation is that the Project Area was utilised for targeted resource collection area by groups with more permanent camps on the coastal strip. With regard to the management of known Aboriginal sites none are considered to be of greater than 'local' significance and as such additional protection under the Coffs Harbour Local Environment Plan or Commonwealth heritage legislation is not considered necessary.

The Moonee Creek estuary and coastal system of headlands and rock outcrops are known to be a focus of Aboriginal occupation in the historic period and the upper estuary system- which forms the northern section of the Project Area- has numerous attributes which would have supported relatively high numbers of Aboriginal people. The lower broad ridgelines and low swamp-like alluvial areas of this northern section would likely have provided a diverse range of resources and access over the Coast Range into the Bucca and Orara Valleys. There is also the potential that the lower swamps and alluvial areas of the Moonee Creek estuary formed much larger archaic lakes and wetlands during the mid-



Holocene (approx. 5000BP) period. As such there is a greater potential for sites in this area to date to the mid-Holocene period when compared to the southern section of the Project Area (Korora Basin).

The impact of development across the entire Project Area is significant. The impacts of the horticulture (bananas, avocados and recently blueberries) would have significantly changed soil profiles and disturbed Aboriginal sites if present. However the documentation of sites within disturbed landscapes in the Project Area is significant as it indicates that Objects are retained within soil structures and may represent small parts of what may have been very much larger archaeological sites.



8. CONCLUSIONS AND RECOMMENDATIONS

The investigation of potential constraints for the release of additional rural residential blocks in the Project Area has identified no significant constraints with respect to Aboriginal and European Heritage. No Aboriginal Places or Items listed under the Heritage Act are recorded within the Project Area. With respect to known Aboriginal sites and PADs the Due Diligence Code of Practice provides an adequate system for the identification and management of the types of sites likely to occur within the Project Area. There is the potential for some areas of the Project Area- particularly around Moonee Creek- to contain regionally significant archaeological sites. The study identified a general trend towards larger potential archaeological deposits in the northern and eastern sections of the Project Area.

The Due Diligence Code of Practice is considered to provide an adequate system for the protection of Aboriginal sites that are known within the Project Area. It is recommended that the Due Diligence Code of Practice is used as a framework for assessment of potential impacts to Aboriginal heritage during all future rezoning or development applications within the Project Area. It is recommended that Coffs Harbour City Council formally consults with the OEH with regard to the practical application of the Code of Practice for future rezoning and development applications- particularly with respect to individual residential dwellings and agricultural infrastructure.



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10. APPENDIX 1- HISTORIC AERIAL PHOTOS



Figure 41: Historic aerial photo 1954 (southern section of Study Area)



Figure 42: Historic aerial photo 1956 (northern section of Study Area)



Figure 43: Historic aerial photo 1969



Figure 44: Historic aerial photo 1979



Figure 45: Historic aerial photo 1989



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