



Aboriginal Cultural Heritage Assessment and Management Plan

Fullerton Cove Residential Subdivision Various Lots Fullerton Cove

**For
Perception Planning
Newcastle, NSW
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This ACHAMP has been prepared to ensure that the cultural heritage of the Aboriginal community is respected and preserved throughout the project. The significance of Aboriginal heritage in the region cannot be overstated, and it is our responsibility to protect and maintain these invaluable cultural assets for future generations

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1.0 Executive Summary

The **Aboriginal Cultural Heritage Assessment and Management Plan (ACHAMP)** for the **Fullerton Cove** project has been developed to ensure the preservation and respect of the Aboriginal community's cultural heritage throughout the project's duration. This plan underscores the significance of Aboriginal heritage in the region and emphasises our responsibility to protect and maintain these invaluable cultural assets for future generations. It has been prepared in accordance with statutory requirements and in particular recent advice from Heritage NSW.

The project, known as **Sandpiper**, involves the construction of a new suburb and town centre at Fullerton Cove. This development includes low-density residential lots, townhouses, units, high-rise residential buildings, a leisure and sporting precinct, a retail precinct, a wastewater treatment plant, an energy station and battery farm, and an education precinct. The site encompasses approximately 50 hectares and includes various lots, with the primary focus on lands north of Coxs Lane.

The ACHMP was developed in consultation with the local Aboriginal community and is based on several previous investigations within and adjacent to the precinct to identify both tangible and intangible cultural heritage. This comprehensive approach ensures that the cultural heritage of the Aboriginal community is respected and preserved throughout the project's lifecycle.

Operational and Training Protocols have been established to ensure that all personnel involved in the project are aware of and adhere to the cultural heritage management requirements. These protocols include mandatory induction training for all staff, contractors, and visitors to the site. The training covers the significance of Aboriginal cultural heritage, the specific heritage values of the Fullerton Cove area, and the procedures to follow if any heritage items are discovered during the project.

Aboriginal Site Protection Measures have been implemented to safeguard identified heritage sites within the project area. These measures include fencing off sensitive areas, monitoring by qualified heritage professionals, and regular inspections to ensure compliance with the ACHMP. Any breaches of the protection measures are to be reported immediately, and corrective actions are to be taken promptly.

Aboriginal Site Reporting Requirements outline the procedures for documenting and reporting any new heritage discoveries during the project. This includes maintaining detailed records of the location, nature, and significance of the findings, as well as notifying the relevant Aboriginal community representatives and heritage authorities. The reporting process ensures transparency and accountability in managing cultural heritage throughout the project's duration.

Link to Other Environmental Management Plans ensures that the ACHMP is integrated with other environmental management plans for the project. This holistic approach ensures that cultural heritage considerations are incorporated into all aspects of the project's environmental management, promoting sustainable and responsible development.



Performance Monitoring and Review mechanisms have been established to assess the effectiveness of the ACHMP and ensure continuous improvement. Regular audits and reviews are conducted to evaluate compliance with the plan, identify any areas for improvement, and implement necessary changes. This iterative process ensures that the ACHMP remains relevant and effective throughout the project's lifecycle.

An **Aboriginal Cultural Heritage Induction Program** is included and is designed to ensure that all personnel involved in the project are aware of and adhere to the cultural heritage management requirements. This program underscores the significance of Aboriginal heritage in the region and emphasises our responsibility to protect and maintain these invaluable cultural assets for future generations.

The induction program includes mandatory training for all staff, contractors, and visitors to the site.

The program also includes **Operational and Training Protocols** to ensure that all personnel are aware of and adhere to the cultural heritage management requirements.

Aboriginal Site Protection Measures have been implemented to safeguard identified heritage sites within the project area.

Aboriginal Site Reporting Requirements outline the procedures for documenting and reporting any new heritage discoveries during the project.



2.0 The Project

Perception Planning on behalf of Coastal Developments Pty Ltd is undertaking a Planning Proposal for **Precinct 1A** Fullerton Cove.

This Planning Proposal (PP) seeks to rezone seven (7) individual properties referred to as **‘the site’** or **‘Precinct 1A’**. This Precinct has been defined through discussions with Council, and responds to the relevant requirements detailed within the letter issued by Council dated 17 June 2024. Rezoning of other land adjoining the site will be subject to separate and future Planning Proposals.

As part of the assessment process for this project to proceed, investigation of Aboriginal cultural heritage for the project area was undertaken by MCH (McArdle Heritage) for Port Stephens Council.

That investigation consisted of an Aboriginal Cultural Heritage desktop Assessment (ACHA) developed in consultation with the local Aboriginal community and was based on several previous investigations within and adjacent to the precinct to identify tangible and intangible cultural heritage (MCH 2023). Further details of the report and its findings are presented in Section 4 and is attached as Appendix A.

Fullerton Cove is a central location between Newcastle and Nelson Bay. Fullerton Cove lies within the **Hunter Sub-Region** of NSW, in the Port Stephens LGA. The Newcastle Airport is 5km away from Fullerton Cove. Within NSW, the Hunter is one of the fastest growing regions, projected to increase from 725,000 people in 2016 to approximately 840,000 people by 2036. The project is for a new town centre and housing development. The project area in a regional context is shown at Figure 1, local context Figure 2, the project area Figure 3.



Figure1: Regional location





Figure 2: Local Context



Figure 3: Fullerton Cove Project Area



Due to the intricate nature of the proposal, land access challenges, and the presence of an Aboriginal Cultural Heritage Management Plan that legally pertains to a substantial portion of the study area, guidance was obtained from Heritage NSW. A meeting (teams) was held with Heritage NSW Officers, Rose O' Sullivan and Corey O' Driscoll on 14th April 2025. Their advice was to adapt the ACHA process and include a management plan that would ensure continuous evaluation of cultural values throughout the project.

*The Fullerton Cove Project (FCP) **Figure 3** includes some 60 individual is approximately 50 ha. However, It must be explicitly stated, that this Planning Proposal only applies to the land identified in **TABLE 1** below and shown in **Figure 4**. Rezoning of other land adjoining the site will be subject to separate and future Planning Proposals.*

Lot	DP	Address	Rezoning Proposed
991	627179	16 George Street, Fullerton Cove	RU2 Rural Landscape to R2 Low Density Residential & C3 Environmental Management
1	1142113	21 Coxs Lane, Fullerton Cove	RU2 Rural Landscape to R2 Low Density Residential & C3 Environmental Management
201	39968	21 Coxs Lane, Fullerton Cove	RU2 Rural Landscape to C3 Environmental Management
1910	557701	21 Coxs Lane, Fullerton Cove	RU2 Rural Landscape to R2 Low Density Residential
1	1006307	21 Coxs Lane, Fullerton Cove	RU2 Rural Landscape to R3 Medium Density Residential & C3 Environmental Management
3	111519	10 Fullerton Cove Road, Fullerton Cove	RU2 Rural Landscape to R2 Low Density Residential & C3 Environmental Management
1	794575	10 Fullerton Cove Road, Fullerton Cove	RU2 Rural Landscape to R2 Low Density Residential & C3 Environmental Management

Table 1: Site particulars and proposed land use zones



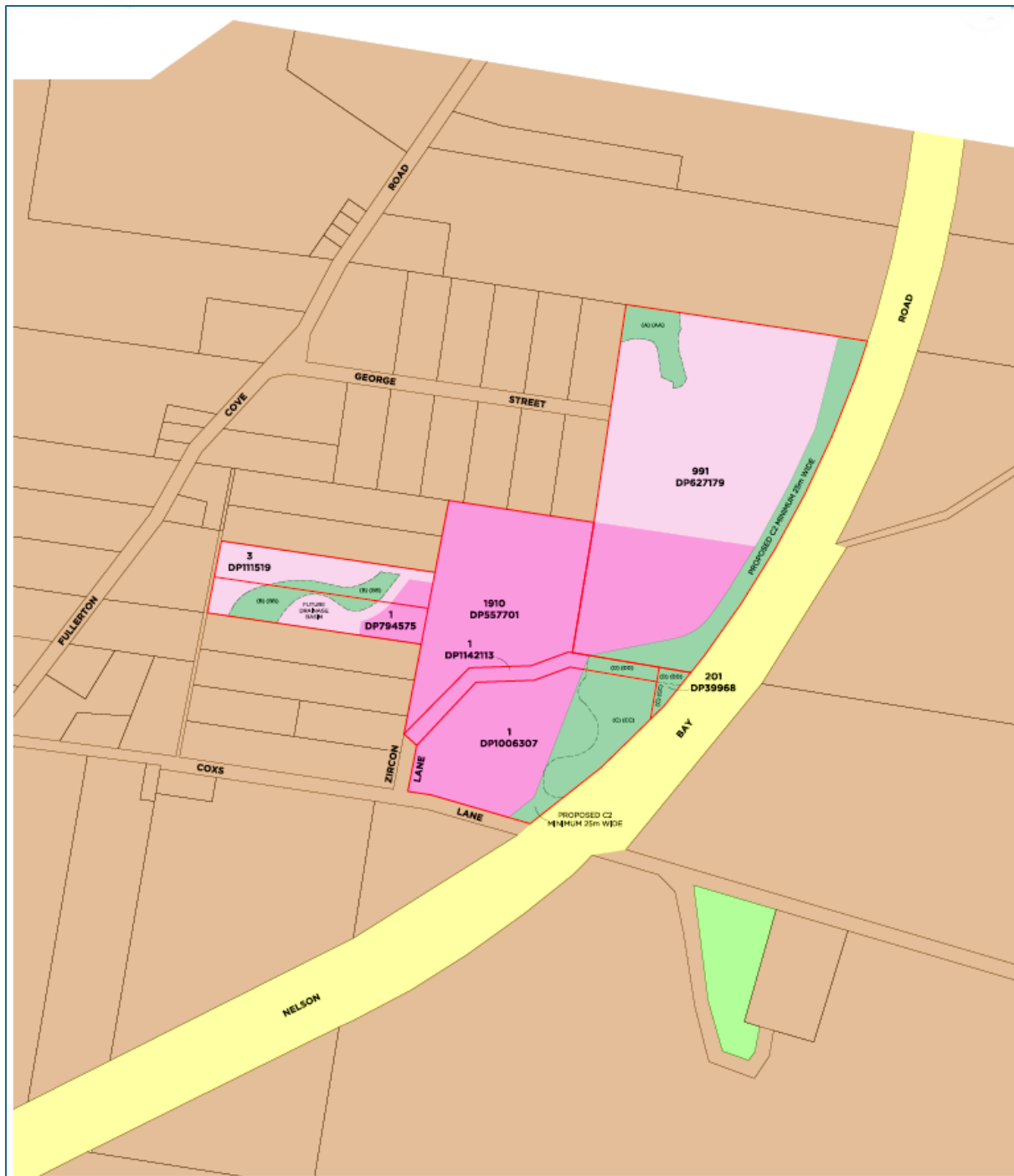


Figure 4 Precinct 1A Boundary marked in red

2.1 Site Description

- **Soil Landscape**

The Subject Site is mapped as occurring on two soil landscapes: Sheet 'Bobs Farm variant a' and 'Hawks Nest' (DPE, 2022e, Figure 5)

The 'Bobs Farm variant a' soil landscape is an estuarine flat on the Tomago Coast Plain. The landscape is a lake shore beach deposit remnant with low relief (<1 m) and elevation (1 – 3 m). The soils are deep and very poorly draining. The landscape is underlain by Holocene estuarine mud deposits which consist of clay and silt, as well as tidal delta sands. Much of the landscape has been cleared, however, the landscape still supports open woodland communities with dominant species such as *Casuarina glauca* (Swamp Oak) and *Melaleuca quinquenervia* (Broad-leaved Paperbark), occasionally *Livistonia australia* (Cabbage Tree Palm) and *Eucalyptus robusta* (Swamp Mahogany) are present. Currently, the landscape is used predominantly as pasture lands.

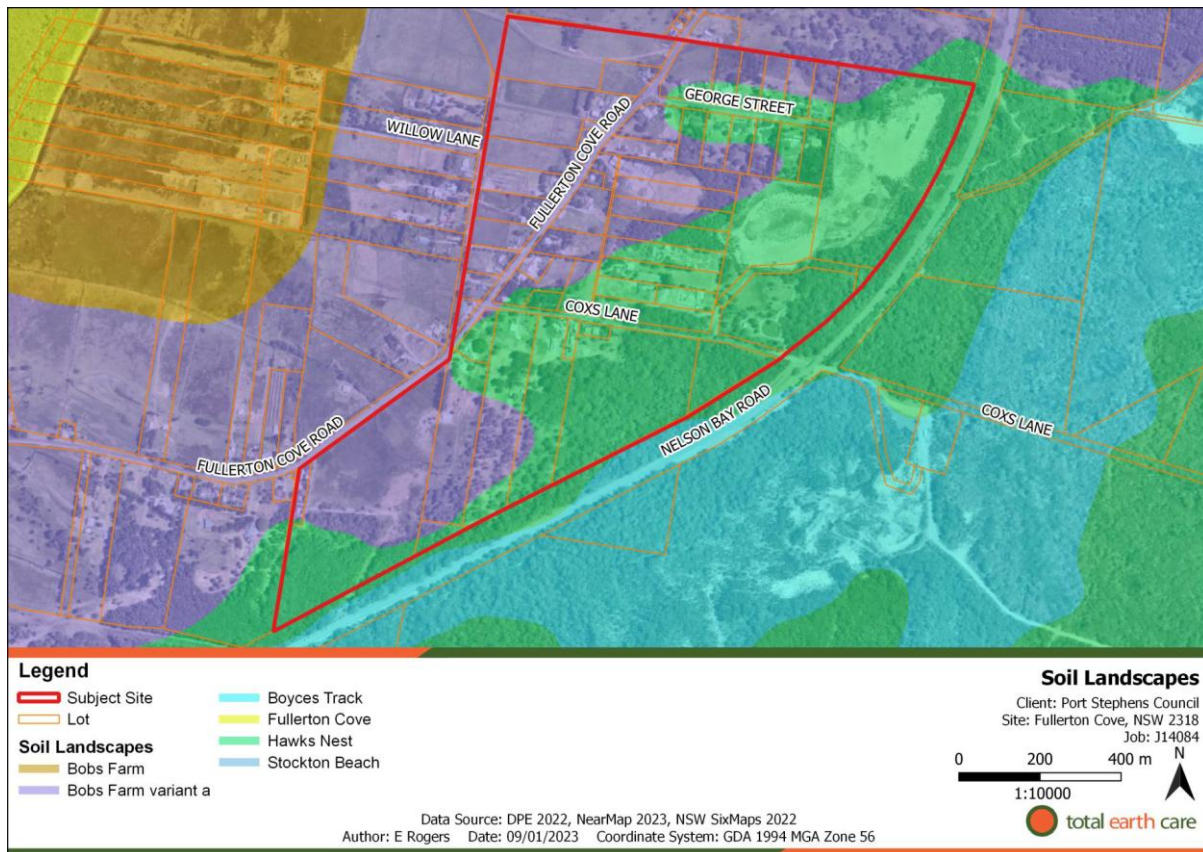


Figure 5 Soil Landscapes

The 'Hawks Nest' soil landscape is found on the Tomago Coastal Plain and is composed of Holocene quartz sandsheets, low transgressive dunes, and beach ridges. The landscape is a gently undulating made up of low sandy dunes and swales with a local relief of <3 m and elevations of 3 – 12 m asl. Much of the landscape remains uncleared and supports tall open-forest and woodlands with common species such as *Angophora costata* (Smooth-barked Apple), *Eucalyptus pilularis* (Blackbutt), *Corymbia gummifera* (Red Bloodwood), *Banksia serrata* (Old-man Banksia), with an understorey of *Actinotus helianthi* (Flannel Flower), *Persoonia* spp., (Geebung), and *Acacia longifolia* (Sydney Golden Wattle). Currently, the landscape is used as natural bushland.

- **Topography**

The topography within the Subject Site varies from 14 – 2 m asl, sloping from dune crests in the Northeast, East and Southeast. The crests have a west facing aspect and shelter the western flat terrain of the Subject Site from coastal wind (Figure 4-2).

- **Disturbance**

The National Parks and Wildlife Act (1974) which regulates Aboriginal Heritage protection in New South Wales defines disturbed land as: "Land is disturbed if it has been the subject of human activity that has changed the land's surface, being changes that remain clear and observable.

Disturbed soil landscapes are dominated by ground surfaces arising from human activity. Soil parent materials have been moved, accumulated, removed or replaced (with soil or other items).

Landform elements include fill-tops, embankments, cut faces, cut-over surfaces, dams, mounds and pits.

The FCP land has been used for pastoral purposes (grazing) and agricultural activities, involving the wholesale clearance of native vegetation, the introduction of pasture grass, the construction of dams, housing, fencing, numerous tracks and associated infrastructure (water, electricity, telephone).

The **Precinct 1a** land can be considered as highly disturbed because between 1975 and 1977 it was mined for mineral sands (rutile and zircon) with the previous mine tailings (essentially sand) reshaped and rehabilitated to form the larger part of the current site landform. Part of the site has a quarry development consent issued by the NSW Department of Planning and has operated as an extractive industry (sand quarry) since 2008 (MP 07_0145 18/07/2009, 07_0145 MOD 1 17/11/2010 and 07_0145 MOD 2 18/01/2016). The original modification included an additional 3.1 hectares to access 96,000 tonnes of sand. The second modification extended the approved duration of quarrying activities at the Fullerton Cove Sand Quarry, as permitted under Project Approval 07_0145, by four years. The current approvals for the site include a total extraction area of 18ha with the approved resource of 1,056,500 tonnes of sand until 30 June 2020. The existing development consent (PA07_0145 including MOD 1 and MOD 2) includes conditions that require the site to be rehabilitated following the completion of the extractive industries licence.

The sand quarry was conditionally approved on the 18th of July 2009, by the Minister for Planning. The original condition of consent regarding Aboriginal Cultural Heritage was condition 29 in the notice of approval (NOA), which required among other things the development of an Aboriginal Cultural Heritage Management Plan (ACHMP) An Aboriginal Heritage Impact Permit (AHIP) or an ACHMP is usually valid from the date it is signed, unless it is revoked in writing and applies to the land irrespective of change of ownership or use.



The approved ACHMP not only detailed the system and procedures for the **salvage of known objects** but set out the responsibilities of personnel on site in dealing with Aboriginal cultural heritage and the protocols of dealing with unknown Aboriginal Objects. The plan needed to be in place and the salvage program undertaken prior to works commencing within the quarry area.

According to the plan only disturbed shell midden materials and human remains had any likelihood to be uncovered. The plan sets out the protocols in the event either is uncovered.

The extent of the Sand quarry is shown at figure 6 and is also the area covered by the existing ACHMP. The ACHMP was approved because an Aboriginal Heritage Management Plan is required when a development project or activity is likely to impact Aboriginal objects or places, meaning there is a potential for harm to Aboriginal cultural heritage, and an Aboriginal Heritage Impact Permit (AHIP) is needed to proceed; this typically occurs when a project cannot avoid damaging or destroying Aboriginal heritage sites, requiring a plan to manage and mitigate those impacts.



Figure 6 Approved Sand Quarry and ACHMP area (Precinct 1A)

3.0 Previous Aboriginal Cultural Assessments

McCardle Cultural Heritage conducted an extensive assessment in 2003 (Fullerton Cove Place Strategy Desk Top Assessment) to inform the planning proposal for the Project. This ACHMP is based on and a continuation of that study which is attached as Appendix A.

This ACHMP also updates and extends the exiting ACHMP for the sand quarry to the entire project area.

According to McCardle, there have been several Aboriginal Cultural surveys over the project area and adjacent lands and Aboriginal Objects have been identified. A search of the AHIMS register has shown that 71 known Aboriginal sites are currently recorded within one kilometre of the project area and include 22 artefact sites, 13 shell middens, 31 shell and artefact sites, one PAD, one stone quarry, one artefact and PAD sites, one shell and PAD site and one shell, artefact and non-human bone and organic material site. There are five sites in the project area. Figure 7 shows the known objects in relation to the Project.

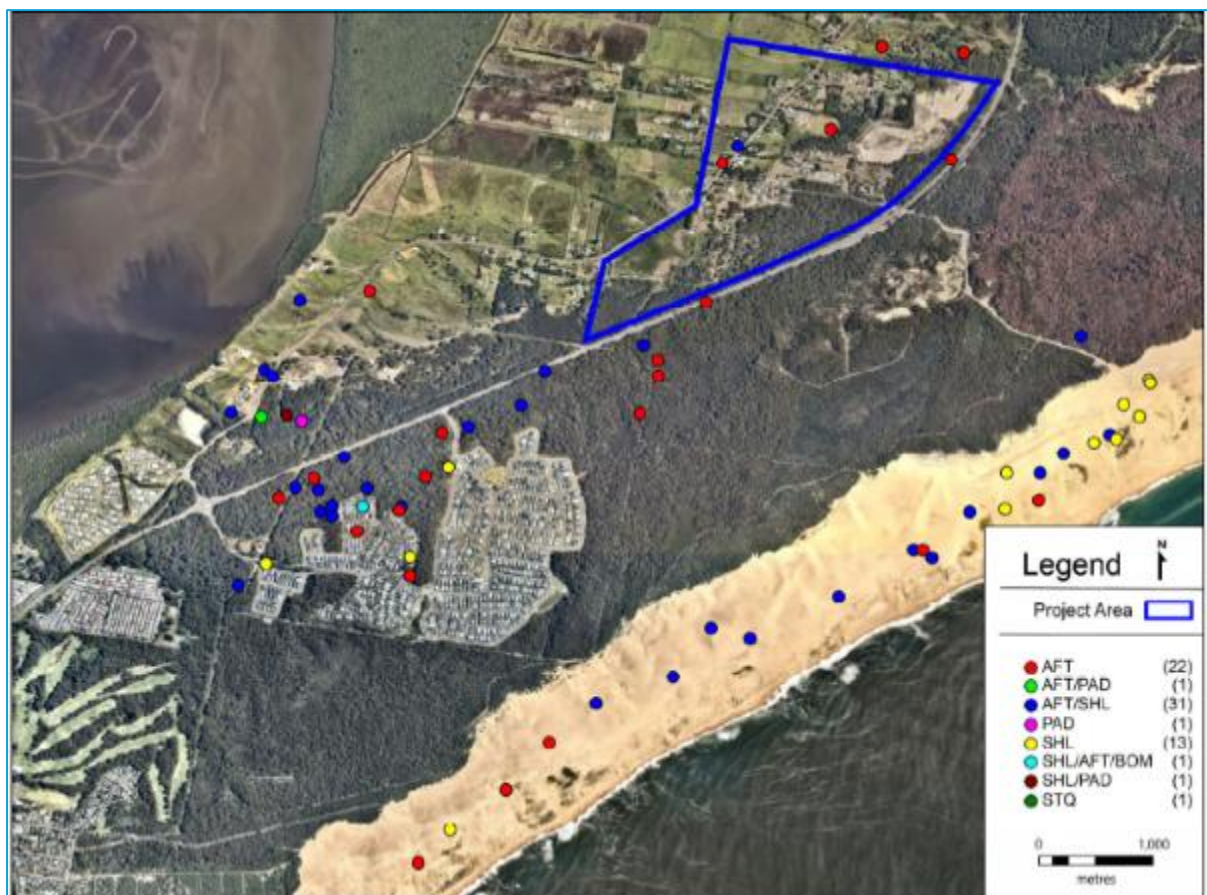


Figure 7 Approximate location of known sites (McCardle 6.3)

McArdle, 2023 in her initial assessment for the Project, analysed and discussed 19 of the reports that were undertaken and available on the Aboriginal Heritage Management System (AHIMS). Figure 8 sets out the approximate location of those studies.

Previous Studies According to McCardle, at least 19 studies have been taken within the local area. Figure 8 is her map of the previous local assessments.

All archaeological surveys throughout the local area have been undertaken in relation to environmental assessments for developments. The most relevant investigations indicate differing results and observations based on surface visibility and exposure, alterations to the landscape (including mining, industrial and residential development), proximity to water sources and geomorphology.

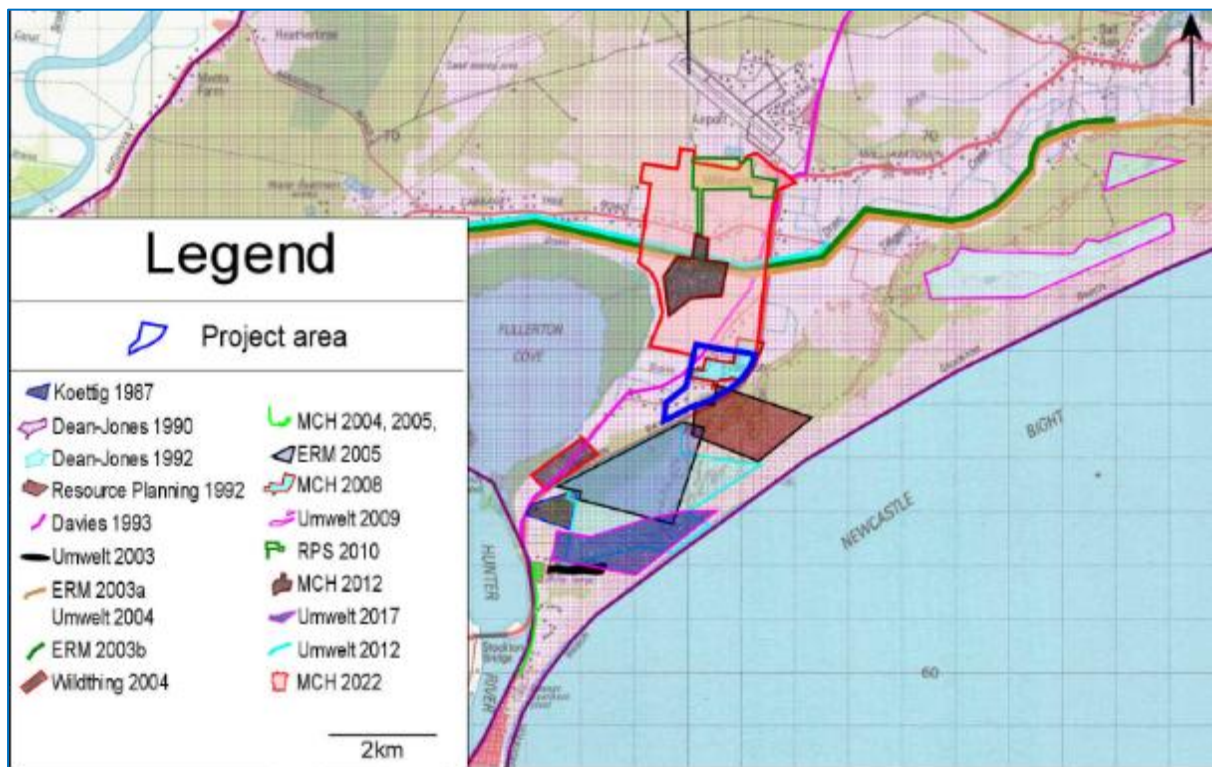


Figure 8 Previous Assessments within the area (McCardle Figure 6.4)

Section 6.3 of the McCardle assessment t provides a summary of previous local archaeological assessments in the Fullerton Cove area. Key points include:

1. **Koettig (1987):** Identified 11 new sites, mostly shell middens and artefact scatters, on dune tops and slopes. The area showed continuous distribution of cultural material across dune crests.
2. **Dean-Jones (1990):** Recorded 119 sites, mostly shell scatters and open artefact scatters, concentrated on elevated ground near wetlands. Sites were found in seaward margins of active dunes and beach/foredune areas.
3. **Resource Planning (1992):** Identified several middens and artefact scatters in foredunes, deflation basins, and stabilised dunes. Highlighted the potential for subsurface deposits.
4. **Davies (1993):** Surveyed ten routes for optic fibre cables, identifying three middens near Route 4. The predictive model was accurate in determining site types.

5. **Resource Planning (1994)**: Surveyed Lot 16, DP 258848, identifying two sites: a midden and a midden/artefact scatter. Recommended conservation of significant sites.
6. **Umwelt (2003)**: Identified two artefact scatters on a beach ridge and modified landform. Recommended no archaeological constraints due to high disturbance.
7. **ERM (2003a)**: Identified ten new sites and seven PADs along the proposed electricity supply upgrade route. Recommended test excavations and conservation measures.
8. **ERM (2003b)**: Surveyed a proposed access road, identifying six sites and one PAD. Recommended subsurface testing and conservation measures.
9. **Wild Thing Environmental Consultants (2004)**: Identified a shell midden/artefact scatter at Fullerton Cove Road. Recommended relocation of cultural material to a conservation area.
10. **ERM (2005)**: Conducted extensive excavations at Fern Bay, identifying several new sites with high densities of artefacts and shell middens. Recommended conservation of significant areas.
11. **MCH (2004, 2005)**: Conducted test excavations for a sewerage pipeline at Fern Bay, recovering artefacts and shell material. Recommended additional excavations and salvage.
12. **MCH (2008)**: Assessed a proposed sand extraction operation at Fullerton Cove, identifying a large artefact scatter. Recommended community collection due to extensive past disturbances. This is the area of focus for this project.
13. **RPS (2010)**: Conducted test excavations at Williamstown Aerospace Park, recovering a large number of artefacts and identifying two Aboriginal hearths. Recommended no further archaeological work.
14. **MCH (2012)**: Assessed the proposed Glasshouse development at Williamstown, identifying no sites or PADs. Recommended no further archaeological constraints.
15. **Umwelt (2012)**: Conducted salvage excavations at Tomago, recovering a small number of artefacts. Recommended reburial of artefacts following proposed works.
16. **MCH (2022)**: Conducted a desktop assessment for the Williamstown SAP, identifying high potential for sites in the northern portion of the SAP boundary. Recommended further investigations.

Overall, the assessments indicate a high potential for archaeological sites, particularly shell middens and artefact scatters, in dune systems overlooking the interbarrier depression. Past land uses have considerably impacted site integrity, but significant cultural material may remain.

An ACHMP exists over Precinct 1A. In NSW, Aboriginal cultural heritage management plans are legally required for developments and activities that may impact Aboriginal objects or places. These plans are governed by the National Parks and Wildlife Act 1974 (NP&W Act). The Act mandates that the Director-General of the Department of Environment, Climate Change, and Water (DECCW) oversee the protection of Aboriginal objects and places. In essence, Aboriginal cultural heritage management plans are a legally binding requirement for developments and activities that may impact Aboriginal sites.

In addition, assessments have shown that other Aboriginal objects are present within the larger project area not covered by the ACHMP and that there may be a likelihood the proposed



development, may impact or interact with Aboriginal cultural heritage. Therefore, a detailed strategy to manage and protect these heritage values is required.

This ACHAMP provides direction for the day-to-day management of Aboriginal cultural heritage to ensure cultural values are protected. It is a management tool for development or conservation projects which affect Aboriginal cultural heritage to ensure consent conditions are met.



4.0 Purpose of the ACHAMP

Precinct 1A area was approved as the Fullerton Cove Sand Extraction Project for sand extraction.

An ACHMP exists over the land. Other land in the FCP is either existing residential and highly disturbed or disturbed with low visibility for artefact detection. As known Aboriginal Objects have been identified through previous surveys it is incumbent to develop an Aboriginal Cultural Heritage Management Plan that manages both known and potential future Aboriginal objects, as well as intangible Aboriginal Heritage.

This document has been developed to address Ministerial Direction 3.2 as well as **meeting the existing and approved Aboriginal Cultural Heritage management conditions applying to the land within the precinct**, and provides guidance on:

- Processes to maintain ongoing consultation with the Aboriginal stakeholders and in particular, Worimi Local Aboriginal Land Council as the legislated peak body for the protection of Aboriginal culture and heritage within its boundaries.
- Management procedures for Aboriginal cultural heritage values within, and adjacent to, the project during pre-construction and construction phases
- protocols and procedures for unexpected finds, such as human remains • protocols for undertaking activities in area areas that have not been previously assessed and
- other administrative requirements, including post-project management of Aboriginal finds and recovered material, ongoing compliance, regular review and update of the ACHMP to ensure its functionality is maintained through the project
- Aboriginal Cultural Heritage Management for the entire precinct.

Heritage NSW deems a plan to comply, if it meets their ACHMP Checklist which is attached as a cover sheet showing how this plan meets those requirements.

The proponent commits to implementing the requirements of the ACHMP prior to and during the proposed development activities.

The purpose of the Aboriginal Heritage Management Plan is to safeguard Aboriginal heritage within the context of the project, ensuring that Aboriginal cultural values are recognised and respected. This ACHMP's scope, applies throughout all phases of the project—from planning and implementation to operation and completion. The plan will be reviewed annually. The plan also emphasises the commitment to aligning the ACHMP with applicable laws and policies while fostering cooperation with Aboriginal communities to promote informed decision-making regarding heritage matters.

3.1 Legislative context

The *National Parks and Wildlife Act 1974*, (NPW Act) administered by Heritage NSW, is the primary legislation for the protection of some aspects of Aboriginal cultural heritage in NSW. Section 86 of that Act has been amended (2010) and deals with harming and desecrating Aboriginal objects.



'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.'

Under section 86 of the NPW Act, it is an offence to 'harm' an Aboriginal object.

Although, Aboriginal heritage is managed under the National Parks and Wildlife Act 1974, Other Commonwealth and State legislation applies to Aboriginal heritage, although none are relevant to this project. They include:

The Native Title Act 1993 (Cth) recognises the rights of Aboriginal and Torres Strait Islander peoples over land and waters according to traditional laws and customs. In New South Wales (NSW), the Act impacts development by:

- *Recognition of Native Title*: Identifies lands subject to native title, potentially restricting development and requiring engagement with Indigenous groups.
- *Obligation to Negotiate*: Establishes a negotiation process with Indigenous landholders for developments on native title lands, which may delay or change plans.
- *Protection of Cultural Heritage*: Mandates consideration of Aboriginal cultural heritage, impacting project approvals and necessitating consultations and assessments.
- *Future Acts Regime*: Outlines processes for proposed developments based on native title existence, with varying consultation and consent requirements.
- *Legal Implications*: Developments affecting native title may face legal challenges or compensation claims, potentially leading to delays and increased costs.

Overall, the Act promotes inclusive development by emphasising engagement with Indigenous communities and respectful cultural heritage management, fostering sustainable and socially responsible practices.

The Aboriginal and Torres Strait Islander Heritage Protection Act 1984 provides a framework for the protection of places and objects of Indigenous significance, allowing the Minister to intervene and enforce protection measures when cultural heritage sites are threatened. This act empowers Aboriginal and Torres Strait Islander peoples to seek protection for their sacred and important sites, ensuring appropriate consultation and recognition of their rights.

The Australian Heritage Commission Act established the Australian Heritage Commission, which plays a crucial role in identifying and protecting places of natural and cultural heritage significance across Australia, including both Indigenous and non-Indigenous sites. Together, these acts reflect the commitment of the Australian government to protect the cultural heritage of Aboriginal and Torres Strait Islander peoples and to promote awareness of its importance to Australia's identity and history.



3.2 Other Requirements

The ACHMP for the Fullerton Cove sand extraction project is a document that was formulated as a condition of consent (condition 29) for approval on August 18, 2008. The ACHMP is still in effect. The condition is as follows.

29. The Proponent shall prepare and implement an Aboriginal Cultural Heritage Management Plan to the satisfaction of the Director-General. This plan must:

(a) be prepared in consultation with all relevant Aboriginal communities.

(b) be submitted to the Director-General for approval prior to commencement of Construction operations; and

(c) include a:

- *description of the measures that would be implemented to salvage any identified Aboriginal sites within the disturbance area.*
- *description of the measures that would be implemented to protect any Aboriginal sites outside the disturbance area; and*
- *description of the measures that would be implemented if any new Aboriginal objects or skeletal remains are discovered during the project*

The condition had 3 requirements to be included in the ACHMP.

1. A program to collect the known artefacts (scattered midden)
2. Measures to protect any Aboriginal Objects outside the disturbance area
3. Measures to be undertaken if unknown Aboriginal objects are discovered during the ongoing operation of the project.

With the subsequent approval of the sand quarry, an Aboriginal Heritage Management plan was formulated in consultation with the Aboriginal stakeholders and a salvage program conducted. That is, the collection of known surface objects and the **sieving of sand** to salvage subsurface objects in areas of suspected potential were completed in 2010.

On the 17th June 2024, Port Stephens Council advised Perception Planning that the MCH 2023 Assessment:

"... will need to be updated to an Aboriginal Cultural Heritage Assessment Report that is prepared in accordance with relevant policy and guidelines, identifying, describing and assessing any impacts to Aboriginal cultural heritage sites or values associated with the project. This will include, but may not be limited to, including results of thorough archaeological survey and test excavations (where necessary).

The planning proposal must demonstrate consistency with Ministerial Direction 3.2 Heritage Conservation."

Extending the Aboriginal cultural heritage plan to a larger area can be beneficial for several reasons:



- **Comprehensive Heritage Protection:** A larger area may encompass additional sites of cultural significance that had not been previously identified. Extending the plan can enhance the protection of these sites and ensure that Aboriginal heritage is respected and preserved.
- **Cultural Landscape Recognition:** Aboriginal cultural heritage is often tied to broader landscapes rather than isolated sites. By extending the area, the plan can better reflect the interconnectedness of cultural practices, traditions, and the environment, acknowledging the holistic nature of cultural heritage.
- **Biodiversity and Environmental Stewardship:** Many Aboriginal cultural practices are linked to specific environmental features and ecosystems. A broader plan can encourage the protection of these natural resources and promote sustainable land management practices that benefit both cultural heritage and biodiversity.
- **Community Engagement:** Extending the plan can provide greater opportunities for Aboriginal communities to engage in heritage management. It empowers them to have a voice in decisions affecting their cultural heritage, leading to stronger relationships between communities, stakeholders, and authorities.
- **Impact Mitigation:** Larger projects or developments might encroach on areas surrounding the original plan. By extending the heritage plan, potential impacts on Aboriginal heritage can be better assessed and mitigated, thereby minimising adverse effects.
- **Education and Awareness:** A broader cultural heritage plan can serve as an educational tool for the wider community, increasing awareness and appreciation of Aboriginal culture, history, and connection to the land.
- **Legal and Policy Compliance:** In some cases, extending the area may be necessary to comply with legal requirements or policies that mandate the consideration of Aboriginal cultural heritage across larger landscapes. This can protect both the environment and the rights of Indigenous peoples.

The last point is important because the sand quarry land continues to operate under the ACHMP irrespective of ownership and land use changes. Further cultural heritage assessment is not required nor legally enforceable. It, however, can be reviewed and updated. Given that the entire Precinct 1A land is disturbed through sand mining it would be opportune to create a n extensive ACHMP that manages and protects existing and future Aboriginal heritage in an holistic and intentional approach.

The following table outlines the planning proposal requirements and how they are addressed.



Requirements	How Addressed
Updated assessment	This Document – The ACHMP
Consistency with Ministerial Direction 3.2 - Protection of Aboriginal Objects and Places - Protection of Aboriginal heritage identified through assessments	The ACHMP for the Sand Quarry. Items identified in the MCH assessment (appendix A) are managed under this plan
Aboriginal Community Consultation	Section 3.3 Consultation

Table 2 Planning Proposal requirements relating to Aboriginal Heritage

3.3 Consultation

For this project, MCH identified Aboriginal peoples and groups who possess cultural knowledge relevant to the proposed project area. Recognising their ability to ascertain the cultural significance of Aboriginal objects and places, the process began with contacting various sources, as advised by Heritage NSW and the Department of Premier & Cabinet, via letters sent on November 28, 2022. The correspondence included project details and a location map. Responses were documented from several organisations as outlined in Table 2.1, with notable findings including unresponsive government departments and no claims from the National Native Title Tribunal.

MCH created a list of groups to contact, adhering to the Aboriginal cultural heritage consultation requirements. On December 13, 2022, MCH reached out to these groups and also placed an advertisement in the Port Stephens Examiner. This outreach sought to register interest in the project. Responses detailing preferences for consultation format (info packet or meeting) were expected, leading to identification of Registered Aboriginal Parties (RAPs)

An information packet was sent to all identified RAPs, detailing consultation processes and compliance with regulatory requirements, with a response deadline of February 2, 2023. The packet clarified that consultation would not constitute employment and requested information that could assist in selecting field workers.

MCH emphasised the importance of cultural knowledge, stressing that knowledge is not universally accessible and should be managed with care, ensuring that sensitivity and confidentiality are maintained. This stage highlighted the necessity of respecting the traditional owners in the consultation process to uphold cultural protections.

MCH urged RAPs to share sensitive knowledge while ensuring it would not be disseminated without consent. Requests focused on gathering traditional and contemporary cultural knowledge, addressing elements related to ceremonial practices, historical sites, and other culturally significant places relevant to the project area.

MCH used a structured approach to engaging with Aboriginal stakeholders, respecting their cultural rights, and managing the consultation process effectively to ensure compliance with heritage management practices.



The following Stakeholders (Table 3) were identified. On 11/2/2025 they were sent a draft copy of this report for discussion purposes and giving then 14 days to register an interest in the project.

RAP	Contact
A1 Indigenous Services	Carolyn Hickey
Widescope Indigenous Group	Steven Hickey
Nur-Run-Gee Pty Ltd	Leonard Anderson OAM
Mur-Roo-Ma Inc.	Anthony Anderson
Worimi Local Aboriginal Land Council	Jamie Merrick
Karuah Indigenous Corporation	David Feeney
Gomery Cultural Consultants	Dave Horton

Table 3 Initial Registered Aboriginal Parties

Only the WLALC, Nur-Run-Gee Pty Ltd and Mur-Roo-Ma Inc. expressed an interest to be further involved and consulted. A meeting was arranged but was postponed as it was decided to wait upon advice from Heritage NSW to consider that advice before meeting.

The Aboriginal Community comments are contained in **Appendix B** but in summary they noted:

1. The current Aboriginal Cultural Heritage Management Plan (ACHMP) for the quarry lands should be revised to establish an Aboriginal Heritage Reference Group, comprising representatives from stakeholder groups, for the duration of the project. This needs to be in place prior to commencement of works. The roles and functions of the reference group need to be codified and signed off by the proponent and the 3 stakeholder groups. It is envisaged that the WLALC be the led agency as it has formal status under an Act of Parliament.
2. Before any work begins outside the quarry lands, a walkover survey of the area must be conducted by representatives from the Aboriginal Reference Group, and an archaeologist if necessary. Following the survey, the Aboriginal Reference Group will determine the appropriate actions moving forward, and the ACHMP will be expanded to include the newly assessed land.
3. Prior to any land disturbance activities, all workers must undergo training on Aboriginal heritage protocols to recognize and minimize harm to Aboriginal objects.

It must be noted that not only were the registered stakeholders consulted but a meeting with sites officers and others of Worimi LALC was undertaken. All are in favour and positive about the process as defined within this document.



5.0 Impact on Aboriginal Heritage

The assessment by MCH identified 5 registered Aboriginal sites within or adjacent to the Project area. Figure 9 following shows the location of the sites.



Figure 9 Location of AHIMS sites

MCH describes the sites as:

Site 38-4-1645 is a small shell midden recorded in 2014 and is located on the eastern side of Fullerton Cove Rd on the road verge on the southern side of Cocks Land. The verge is located at 306 Fullerton Cove Rd. This site is approximately 40 metre sin length and up to 10 metres in width. This site consists of a shell midden (oyster fragments) with 3 tuff stone artefacts within a deflating sand dune on the margin of the transgressive dune system of the Stockton Bight Outer Barrier and the estuarine flats of Fullerton Cove. It appears that the midden material is deflating towards Fullerton Cove Road from further upslope.

Site 38-4-2011 is artefact scatter along George Street. The site contained 23 surface artefacts and 2 subsurface artefacts. The landform and subsurface soil profile was highly modified.

Site 38-4-2047 is an isolated artefact located along Fullerton Cove RD south of Cocks Lane. It is highly likely this site is part of site 38-4-1645.

Site 38-4-1035 is a highly disturbed large artefact scatter. Due to previous mineral sand mining activities, the artefacts were dispersed over a large area of the mine tailings. There was no intact

stratigraphy as there was extensive displacement of the original sand and soils of the site. This site has been destroyed and subjected to a salvage program.

Site 38-4-0706 is an artefact site. Unfortunately, AHIMS has no report or site card for this site and as such no further information can be provided and it remains unknown if the site coordinates are correct.

As 3 of the sites are within road reserves, whilst technically within the project area, they should not be impacted directly by the Project. However, because they are in a road reserve there is a high likelihood they could be impacted by existing day to day road and pedestrian traffic. As a first step in the management plan, they need to be identified if possible and a specific management regime for them established in consultation with the Aboriginal stakeholders. This is likely to have them repatriated to a keeping place.

For the identified objects, as well as any future discoveries, it is crucial to adopt a decision-making approach focused on **protection, mitigation, and repatriation**.

Such focus emphasises a proactive and responsible framework for managing cultural heritage and archaeological finds. By prioritising protection, we acknowledge the intrinsic value of these objects, which not only embody historical significance but also reflect the identity and cultural narratives of communities. Implementing measures for the protection of these artifacts ensures their preservation against threats such as environmental degradation, theft, or vandalism. Mitigation strategies play a vital role in addressing potential risks associated with these objects, particularly in the face of modern challenges such as climate change and urban development. By preparing to minimise damage and maximise the potential for sustainable management, stakeholders can safeguard these resources for future generations.

Moreover, the principle of repatriation underscores the ethical imperative to return artifacts to their places of origin or to communities with ancestral ties to them. This fosters reconciliation and acknowledges past injustices, ensuring that local populations have agency over their cultural heritage. Overall, adopting this comprehensive decision-making approach not only enhances our stewardship of historical objects but also promotes social justice and cultural dignity.

The project's potential effects on these resources have been evaluated, considering both direct and indirect impacts. It is believed that if the recommendations are implemented, there will be no adverse effects. The recommendations emphasise the importance of comprehending these impacts in order to create strategies that reduce harm and support the conservation of Aboriginal heritage for future generations.



6.0 Aboriginal Community Involvement

In managing Aboriginal cultural heritage through this ACHMP, it is essential for Aboriginal people to take on various roles and responsibilities that are crucial for the preservation and respect of their cultural heritage. The process is based on engaging with CHLALC, which includes consultations and opportunities for collaboration. By prioritising the involvement of the Aboriginal community, this plan emphasises the significance of collaborative decision-making, ensuring that Aboriginal perspectives are acknowledged and valued throughout the project's duration. It reinforces the commitment to fostering respectful relationships and encouraging ongoing communication with Aboriginal stakeholders.

However, the first step in managing Aboriginal Cultural Heritage is to establish an Aboriginal Reference Group for the duration of the project. It is important to codify the arrangement. Such codification will include but not be limited to clear guidelines and criteria for membership, the scope of the group's influence, and outline the group's responsibilities and activities related to the development. This involves creating a formal structure for the group, specifying its purpose, and defining how it will interact with other stakeholders involved in the development. The specific goals the reference group will work towards. How the group will make decisions and reach consensus on key issues.

To provide further opportunity to identify and recover any surface cultural materials that were identified and/or may have been missed during the ACHA process, an additional site inspection must be undertaken. The site inspection will be undertaken prior to any ground disturbance by site officers from WLALC.

This activity is for cultural purposes rather than archaeological reasons, and as such an archaeologist is not required to participate. However, the proponent will ensure the sites officers have suitable on-site support to undertake the works safely, and that any recovered cultural material is appropriately managed.

Where cultural materials are identified, they will be collected by the participants, subject to relevant analysis and reporting. That is bagging, tagging, recording and collection of any artefacts and repatriated to the 'Keeping Place'. Site cards will need to be filled out and entered into AHIMS.

The WLALC in partnership with Sydney University has developed an artefact research centre at Murrook. It would be beneficial for any recovered artefacts to be transferred to the facility, analysed and appropriately placed in a keeping place.

The following table outlines the responsibilities and duties that need to be agreed between the WLALC and the project manager prior to commencement of each stage of bulk earthworks. It would be appropriate for it to be in the form of a signed covenant.



Role	Description
Archaeologist	Professional heritage advisor who guides/directs, oversees the archaeological work and ensures legislative compliance but does not need to be present. Mediates heritage disputes and ensure compliance with this plan.
Cultural Heritage Advisors	Aboriginal people serve as advisors or consultants, providing knowledge and insights to guide the evaluation and management of cultural heritage objects, attending regular project meetings, and advising on mitigation measures for each stage of earthworks.
Site Officers	They participate in surveys to identify and record cultural heritage objects.
Monitors	Aboriginal monitors may work alongside contractors during each bulk earthworks stage phase to ensure that cultural heritage considerations are respected and to manage any heritage finds appropriately.
Trainers	They provide education and training to project staff about Aboriginal cultural heritage, its significance, and appropriate behaviours and practices when dealing with Aboriginal heritage.
Repatriation Officers	They may work on repatriating Aboriginal objects to the 'Keeping Place' in a culturally appropriate and effective way. They also complete the required site recording card and register it on AHIMS.
Site Surveyors	They participate in surveys to identify and record cultural heritage sites and landscapes that are of importance to their communities.
Field Workers	Aboriginal community involvement in: • site protection measures (e.g. fencing) • participation in salvage works • other matters that may be required from time to time

Table 4 Potential Aboriginal Community Roles

The above roles do not need to have a person in each role. One person may fulfill several roles. That will be a matter of agreement between the parties.



7.0 Protocols for Heritage Management

Operational protocols to manage Aboriginal heritage are required prior to and during the construction phase, detailing the systematic practices that will be adopted to protect cultural resources. This includes training programs for project staff about Aboriginal heritage significance and the proper actions to take when it is present. Specific protocols for monitoring, assessing, and responding to heritage-related incidents or concerns have been formulated, so that all workers are adequately prepared to uphold Aboriginal heritage values throughout the project's duration. The following cultural heritage process and procedures must be implemented during the construction phase of the project.

Induction

All employees, contractors, and subcontractors engaging in ground-disturbing activities will receive an induction on Aboriginal cultural heritage. A Cultural Heritage Advisor from the WLALC or the archaeologist will conduct this induction for key project team members before any ground disturbance occurs. Future inductions may be led by the project manager (or nominee), using the induction training program as part of this ACHMP. It is essential for the Cultural Heritage Advisor to periodically participate to ensure that the quality and relevance of cultural inductions are upheld throughout the project's construction phase.

Additionally, visitors and general contractors not engaged in ground-disturbing activities will be made aware of their duty to safeguard cultural heritage through a dedicated cultural heritage section in the general site induction.

A register of who was inducted, when and by whom shall be kept onsite at all times and available for inspection by the Cultural Heritage advisers or the archaeologist.

The site induction will cover the following key points:

- Aboriginal sites and places have been documented throughout the area and hold significance for the Aboriginal community and should be respected.
- Aboriginal Objects and Places are legally protected, and project approvals include conditions related to potential impacts on specific Aboriginal sites in accordance with the Aboriginal Cultural Heritage Management Plan (ACHMP).
- Potential Aboriginal sites could consist of isolated stone artefacts and stone artefact scatters. The section on Artefact Identification from the Comprehensive Guide included in the induction program will be available on-site at all times to assist inductees in recognising what to look for. Consideration will be given to laminating this guide to ensure its durability.

There are established procedures for unexpected findings, which require work to cease if cultural materials or skeletal/human remains are discovered on-site. They are compiled as 2 flow charts and are appended to the induction program **Appendix C**. They will be kept on site at all times and consideration should be given to laminating them to ensure durability.

In summary, the following points will be applicable:



Unexpected Finds

- All operations in the vicinity of the Aboriginal object(s) must be halted immediately.
- The individual who discovered the Aboriginal objects must promptly inform the designated supervisor of the activity, such as the Project Manager, Foreman, or Cultural Heritage advisor
- Any construction activities that could potentially endanger the Aboriginal objects or values must stop. Only work necessary for ensuring safety in the area is allowed to continue.
- An appropriate no-go zone (at least 5 m radius) must be established to protect the Aboriginal object(s).
- Reach out to the project archaeologist to guide the management of the discovery moving forward. However, appropriate documentation of the site must be performed by the heritage professional along with bagging tagging and repatriation.
- Efforts should be made to avoid cultural materials.
- If intact cultural deposits containing Aboriginal objects are identified by the heritage professional, further archaeological excavations will be conducted before any additional work in the area. Excavations will begin with an initial investigative phase to assess the site, followed by a more comprehensive salvage excavation if significant cultural material is discovered.
- Once the archaeological activities on-site are completed to the satisfaction of the project archaeologist, construction activities in the area of the find may resume.
- All archaeological activities will ensure that any cultural materials, as well as chronological, paleoenvironmental, and sedimentological samples collected, are appropriately analysed and documented in a report, which will be submitted to Heritage NSW

Unexpected Skeletal Remains

- All work must STOP in the vicinity of the remains. The remains must be left in place and protected from further harm or damage. All construction that could potentially harm the human remains must cease. Only construction that is required to make the area safe is permissible.
- The person who identified the human remains must immediately notify the person in charge of the activity (e.g. Project Manager).
- The human remains are to be protected with the establishment of a no-go zone of at least 10m radius.
- The person in charge will notify NSW Police of the discovery as soon as possible. All subsequent steps will be dictated by the NSW Police.
- Contact the project Archaeological consultant and the Heritage Adviser for information purposes only.
- If the NSW Police advise that the human remains are of ancestral Aboriginal origin, and indicate that they will not investigate, the person in charge will contact the project



Archaeologist and cultural adviser to lead the subsequent management of the find. Heritage NSW (T: 131 555) will also be notified.

- All future management of the human remains is to be determined by WLALC the archaeologist and Heritage NSW. As such, discussion between the RAPs, project archaeologist, the proponent and contractor will be organised as soon as possible. Once an agreement on the subsequent management of the find is undertaken, Heritage NSW will be advised of the proposed course of action to be implemented.



8.0 Protection and Mitigation Measures

This ACHMP is designed to minimise adverse impacts on Aboriginal heritage throughout the implementation of the project. This plan includes proactive mitigation measures such as the relocation of existing artifacts, documented conservation of the archaeological buffer zone in concert with the environmental management plan, and Aboriginal workers focused on preserving local Aboriginal heritage sites. It may be necessary to take additional steps to offset any anticipated impacts, reinforcing protection for cultural heritage.

To safeguard Aboriginal sites during project activities, specific strategies will be employed including physical barriers, restricted access zones, and oversight by Aboriginal heritage advisers to prevent inadvertent damage. Emphasis will be on implementing best practices in cultural heritage management, ensuring compliance with legal requirements, and proactively mitigating potential disturbances to Aboriginal heritage sites. Through these efforts, commitment to respecting and protecting Aboriginal cultural heritage is affirmed.

The following table outlines various actions to manage Aboriginal heritage effectively, identifies the parties responsible for each action, and establishes a timeframe for when the action should occur.

Action	Responsibility	Time Frame
Develop a comprehensive Aboriginal heritage management plan including maps	Archaeologist	Before works under subdivision works certificate commence
Install warning signage or fencing for known sites	Site Manager/Aboriginal field workers	Before works commence
Conduct erosion and sediment control measures	Environmental Officer/Aboriginal field workers	Prior to each Stage of bulk earthworks and throughout project duration
Develop and implement feral animal and weed control measures	Environmental Officer	Before and during works
Conduct regular monitoring of heritage sites and restricted areas	Heritage Officer	Monthly or as required
Create and maintain maps showing 'no-go' and restricted areas	Surveyor/Project manager	Before works commence and updated as needed
Provide training for staff on Aboriginal heritage awareness	Aboriginal Heritage Advisor/ Archaeologist/Training Officer	Before works commence and ongoing for all employees
Integration of this Plan with Environmental Management Plan	Project Manager	Before works commence and for the duration of the project.

Table 5 Aboriginal heritage protection and mitigation measures



9.0 Aboriginal Site Reporting Requirements

In New South Wales (NSW), reporting requirements for Aboriginal sites are governed by the National Parks and Wildlife Act 1974. This legislation mandates that any person who becomes aware of an Aboriginal site, artifact, or disturbance must report it to the relevant authorities, such as the Heritage NSW. These requirements are aimed at protecting and preserving Aboriginal cultural heritage, as well as ensuring that any activities that may impact these sites are appropriately managed and assessed.

Effective protocols for documenting and communicating discoveries or incidents related to Aboriginal heritage sites are essential to ensure compliance with legal obligations, respect for cultural significance, and proper management of these sites. First and foremost, all personnel involved in project activities, including contractors, subcontractors, and field workers, must be trained to recognise Aboriginal heritage sites and understand the importance of reporting any finds promptly. Any individual who encounters an Aboriginal site or artifact has a responsibility to report the discovery immediately to their supervisor or Aboriginal Heritage Officer.

Documentation of findings should be thorough and systematic. Upon reporting a discovery, designated personnel must complete a standardised field report form that includes critical details such as the location (using GPS coordinates), a detailed description of the find, photographic evidence, and any observed contextual information. This documentation serves both as an immediate record and as data for future assessments, so accuracy is paramount. Additionally, any artifacts or remains must be handled with care, ensuring they are not disturbed or removed unless directed by a qualified archaeologist or Aboriginal heritage advisor.

Timelines for notification are also crucial in these protocols. Requiring immediate notification upon discovery ensures that appropriate action can be taken swiftly to protect the site. Typically, findings should be reported within 24 hours, with formal documentation submitted within three working days. Once a report is generated, it should be forwarded to relevant local Aboriginal communities, regulatory bodies, and heritage management authorities to facilitate further assessment and management of the site. This communication not only promotes transparency and collaboration but also integrates Aboriginal perspectives into the management process, honouring the cultural significance of the heritage site in question. By adhering to these protocols, contributes to the preservation and respect for Aboriginal heritage.

The Aboriginal Heritage Information System (AHIMS) contains information for over 100,000 recorded Aboriginal sites and over 14,000 archaeological and cultural heritage assessment reports.

If a new Aboriginal site is found in New South Wales it should be recorded in the Aboriginal Heritage Information Management System (AHIMS).

The procedures for recording new sites are contained in the Induction Program (**Appendix C**).



10.0 Link to Environmental Management Plans

It is important that this ACHMP integrates with the environmental management plan relevant to the project. The environmental Plan addresses biodiversity, water quality, and land use, to promote holistic environmental stewardship.

The Project Manager **must ensure** an integrated approach, for ensuring that Aboriginal heritage considerations are embedded within the broader environmental management strategies employed by the project.



11.0 Performance Monitoring and Review

The performance monitoring and review processes that will be used to assess the effectiveness of the ACHMP are explained in this section. These processes include regular evaluations, audits, and stakeholder feedback mechanisms that help ensure compliance with management strategies and adaptively manage any arising issues.

Adherence to the ACHMP will be evaluated through standard environmental audit practices conducted at regular intervals throughout the project. The audit will assess compliance with approval conditions and will specifically examine the following aspects:

- Protection of all Aboriginal sites
- Conducting inductions that incorporate suitable materials
- Reporting and managing any unexpected discoveries in line with this ACHMP

The Project manager may engage the archaeologist or other consultant to help with compliance reporting as part of an Independent Environmental Audit.

Any instances of non-conformance will undergo a thorough investigation conducted by the proponent and the heritage consultant, in collaboration with the RAPs. The investigation will cover the following aspects:

- A detailed account of the non-conformance and its actual or potential impact on cultural materials.
- Information about all personnel involved in the non-conformance, including their organisation and contact information.
- Any corrective measures taken to rectify the non-conformance.
- Subsequent steps, which may include the necessity for further heritage activities and/or the requirement to inform DPIE/Heritage NSW about the non-conformance.

The ACHMP will be reviewed and revised under the following circumstances:

- Every six months (or as agreed with CHLALC) following its initial finalisation until all ground disturbance activities are completed.
- If activities are proposed outside the areas approved under the SSD.
- If there are modifications to the SSD that could impact Aboriginal heritage.
- In response to identified complaints and/or non-conformances that necessitate adjustments for the effective management of Aboriginal heritage in future project phases.
- If approved project changes alter or eliminate previously planned impacts on Aboriginal heritage that had mitigation measures outlined in the ACHMP but are no longer needed.
- If any other conditions or situations arise that necessitate updates to this plan.



The performance review process will also include dispute resolution procedures which will provide a structured approach for addressing conflicts or grievances related to the management of Aboriginal heritage within a project area.

In the event of a dispute, parties are encouraged to first engage in informal discussions to seek an amicable resolution. If informal efforts do not yield satisfactory results, a formal mediation process may be initiated, involving representatives from the Aboriginal community, project stakeholders, and, if necessary, an impartial mediator who shall be the consultant archaeologist.

The procedures will emphasise open communication and respect for cultural values, allowing all parties to present their perspectives and work collaboratively toward mutually acceptable solutions. Should mediation fail, the dispute may proceed to arbitration by the archaeologist as a last resort, ensuring that the rights and heritage of Aboriginal peoples are upheld while fostering ongoing relationships between stakeholders.

After resolution of a dispute the AHMP will be reviewed and adjusted to improve future management practices and minimise the likelihood of similar issues arising.

Complaints

Any complaints can be made to the key stakeholders identified in Table 5 and will be documented in a 'complaints register' kept with this plan and the induction register. Any complaints will be used in improvements of the ACHMP as outlined in the previous paragraph.



12.0 Recommendations

Although this PP is for Precinct 1A which has an existing Aboriginal heritage management plan nonetheless it is important that this assessment guides the project for Aboriginal Heritage consideration over the entire FCP.

It is therefore recommended that:

1. That the current ACHMP in force for the sand quarry Precinct 1A be updated with this ACHMP and Aboriginal heritage induction program.
2. That an Aboriginal Cultural Heritage reference group consisting of representatives from the stakeholder groups, with WLALC as the lead organisation be established prior to commencement and for the life of the project.
3. That an Aboriginal Cultural Heritage induction programme along the lines of Appendix C be conducted for all workers prior to commencement of works.
4. Prior to the inclusion of any land within the FCP for potential development a pedestrian survey must be undertaken by the Aboriginal stakeholder representatives (and an archaeologist if required) to determine Aboriginal cultural heritage potential that may need avoidance, mitigation or the extension of this ACHMP to that land.
5. That the consent authority advises the proponent that the management of Aboriginal Heritage within Precinct 1 is subject to this updated ACHAMP and in particular the management protocols for unexpected finds and remains..

Signed



Len Roberts

Archaeologist

18/8/2025



13.0 Definitions and/or Glossary of Terms

To ensure clarity and understanding, this section provides definitions, and a glossary of key terms used throughout the ACHMP. The glossary serves as a resource for enhancing communication and ensuring that all participants share a common understanding of the terms and concepts discussed in the document.

ACRONYMS

ACHMP - Aboriginal Cultural Heritage Management Plan

ACHA - Aboriginal Cultural Heritage Assessment

WLALC - Coffs Harbour and District Local Aboriginal Land Council¹

NSW - New South Wales

NPW Act - National Parks and Wildlife Act

AHIP - Aboriginal Heritage Impact Permits

CoA - Conditions of Approval

LGA - Local Government Area

DP - Deposited Plan

References

McCardle, P (2023)

Fullerton Cove Place Strategy Aboriginal Cultural Heritage Desk Top Assessment Report to Port Stephens Council

This report has been compiled according to the specifications provided by Perception Planning. The findings, conclusions, and recommendations presented herein are based on data gathered under specific conditions detailed within the document. The contents of this report are deemed confidential and are intended solely for the use of Perception Planning as per the terms of the agreement with ECHA/MCAS. Distribution or reliance on this report by parties other than JW Planning, Coastal Developments and WLALC, requires prior written approval from ECHA/MCAS. Unauthorised use, including but not limited to reproduction for resale or other commercial purposes, is strictly prohibited unless expressly permitted under the Copyright Act 1968 (Cth), and further consent from ECHA/MCAS is obtained. ECHA/MCAS disclaims any liability and duty of care to third parties regarding this document, except as contractually agreed with Perception Planning and within the bounds of applicable law. © TJ & SM Roberts Family Trust t/a East Coast Heritage & Archaeology. PO Box 5289 East Lismore 2480



APPENDIX



Appendix A

- MCH 2023 report



Port Stephens Council

M

Fullerton Cove Place Strategy Desk Top

LGA: Port Stephens

Aboriginal Cultural Heritage Desk Top Assessment

8 March 2023

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Report No: J2022105 ACHA

Approved by: Penny McCardle

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Signed: 

Date: 8 March 2023

This report has been prepared in accordance with the scope of services described in the contract or agreement between McCardle Cultural Heritage Pty Ltd (MCH), ACN: 104 590 141, ABN: 89 104 590 141, and the proponent. The report relies upon data, surveys, measurements and specific times and conditions specified herein. Any findings, conclusions or recommendations only apply to the aforementioned circumstances and no greater reliance should be assumed or drawn by the proponent. Furthermore, the report has been prepared solely for use by the proponent and MCH accepts no responsibility for its use by other parties.

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EXECUTIVE SUMMARY

McCardle Cultural Heritage Pty Ltd (MCH) has been engaged by Port Stephens Council to prepare an Aboriginal Cultural Heritage Assessment (ACHA), and an Aboriginal Heritage Impact Permit (AHIP), if requires, for the development of a Place Strategy for the Fullerton Cove area.

After commencement of the ACHA, Council notified MCH that access for surveys had not been established and as such to provide a desk top assessment until the survey could be undertaken. This report is the desk top assessment with no surveys undertaken

The underlying geology of the project area is Quaternary gravel, sand silt and clay with “Waterloo Rock; and marine and fresh water deposits (Newcastle 1:250,000 Geological Map Series, 1966). The absence of raw materials for the manufacturing of stone tools (e.g., mudstone, tuff, silcrete) are absent from the project area. The majority of the project area consists of dunes (back barrier sand flats and dune formations of Holocene age) and the north west and south west consisting of low-lying swamp lands (interbarrier depression – formerly a swamp/lagoon). The project area consists of three soil landscapes including the Bobs Farm beach soil landscape (bfa), the aeolian Boyces Track (bt) soil landscape and developed terrain.

In terms of water and subsistence resource availability, the north and south western portions of the project area are situated within the interbarrier depression and the remainder consisting of Holocene dunes. The resource rich inter-barrier depression or swamp (previous lagoon/estuary) was a major source of subsistence resources. The area was very well resourced in terms of fresh water and associated resources as well as marine resources. The interbarrier depression was clearly favoured for hunting and gathering with little to no evidence of past Aboriginal land uses within the interbarrier depression itself, but the elevated dunes overlooking the interbarrier depression and the beach areas having being favoured for camping in close proximity to these resources.

The project area has been cleared and primarily used for pastoral purposes (grazing) and agricultural activities, involving the wholesale clearance of native vegetation, the introduction of pasture grass, the construction of dams, housing, fencing, numerous tracks and associated infrastructure (water, electricity, telephone). The north eastern portion of the project area has also been subject to extensive sand mining (Lot 1910 DP557701 and Lot 991 DP627179) that has extended into the eastern portions of Lot 3 DP111519 and Lot 1 DP 794575. Sid Foggs coach yard, sheds and parking area is located at Lot 8 DP587276 and extends into the western portions of Lot 3 DP111519 and Lot 1 DP 794575. The remainder of the project area appears to include hobby farms and pastoral land.

A search of the AHIMS register has shown that 71 known Aboriginal sites are currently recorded within one kilometre of the project area and include 22 artefact sites, 13 shell middens, 31 shell and artefact sites, one PAD, one stone quarry, one artefact and PAD sites, one shell and PAD site and one shell, artefact and non-human bone and organic material site. There are five sites in the project area:

Site 38-4-1645 is a small shell midden recorded in 2014 and is located on the eastern side of Fullerton Cove Rd on the road verge on the southern side of Coxs Land. The verge is located at 306 Fullerton Cove Rd. This site is approximately 40 metre in length and up to 10 metres in width. This site consists of a shell midden (oyster fragments) with 3 tuff stone artefacts within a deflating sand dune on the margin of the transgressive dune system of the Stockton Bight Outer Barrier and the estuarine flats of Fullerton Cove. It appears that the midden material is deflating towards Fullerton Cove Road from further upslope

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Site 38-4-1035 is a highly disturbed large artefact scatter. Due to previous mineral sand mining activities, the artefacts were dispersed over a large area of the mine tailings. There was no intact stratigraphy as there was extensive displacement of the original sand and soils of the site.

Site 38-4-0706 is an artefact site. Unfortunately, AHIMS has no report or site card for this site and as such no further information can be provided and it remains unknown if the site coordinates are correct.

The majority of the project area is situated within the dune formations of Holocene age with the western side including the interbarrier depression. Within the project area, five AHIMS sites have been identified within the Holocene dunal system. There is a very high potential for additional sites to be located in the dunal system with the highest numbers and highest density sites being located within 50 metres of the interbarrier depression. These sites will then drop off in both numbers and densities eastwards. Sites will increase in both numbers and densities in close proximity to the beach and pycnanthemum. The areas in between the interbarrier depression and the beach were utilised for travel and hunting and gathering opportunities on the way to each resource rich zone.

The dunes overlooking the interbarrier depression would have enabled large scale camping by large groups of people, which is manifest in the archaeological record as large shell middens with artefacts and evidence of food preparation and cooking. The areas further away from the interbarrier depression (50m+), the backbarrier flats and dunes provided reduced resources that would have not allowed for large scale camping but would have supported small to medium sized groups of people for hunting and gathering as well as travel in between these two resource rich environments, and this manifests in the archaeological record as a background scatter of stone artefacts and very low-density shell middens.

Considering the past land uses and impacts (clearing, mining, transport depots, residential houses, dams, agricultural activities, and associated infrastructure and utilities), it is unlikely that shallow in situ deposits remain in that area. However, in situ sites are known to be present in deep deposits throughout the local area and as such both surface and subsurface sites may be expected in the project area, with the highest concentrations and highest densities located within 50 metres of the interbarrier depression.

Worimi traditions also indicate that burials are located under shell middens. Burials are often exposed through erosion in the local area and there is moderate potential for burials to be located in the dunes within the project area.

GLOSSARY

Aboriginal Cultural Heritage Values: traditional values of Aboriginal people, handed down in spiritual beliefs, stories and community practices and may include local plant and animal species, places that are important and ways of showing respect for other people.

Aboriginal Place: are locations that have been recognised by the Minister (and gazetted under the *National Parks and Wildlife Act 1974*) as having special cultural significance to the Aboriginal community. An Aboriginal Place may or may not include archaeological materials.

Aboriginal Site: an Aboriginal site is the location of one or more Aboriginal archaeological objects, including flaked stone artefacts, midden shell, grinding grooves, archaeological deposits, scarred trees etc.

Artefact: any object that is physically modified by humans.

Assemblage: a collection of artefacts associated by a particular place or time, assumed generated by a single group of people, and can comprise different artefact types.

Axe: a stone-headed axe usually having two ground surfaces that meet at a bevel.

Backed artefact: a stone tool where the margin of a flake is retouched at a steep angle and that margin is opposite a sharp edge.

Background scatter: a term used to describe low density scatter of isolated finds that are distributed across the landscape without any obvious focal point.

Blade: a flake that is at least twice as long as it is wide.

Bondi point: a small asymmetrical backed artefact with a point at one end and backing retouch.

Core: a chunk of stone from which flakes are removed and will have one or more negative flake scars but no positive flake scars. The core itself can be shaped into a tool or used as a source of flakes to be formed into tools.

Debitage: small pieces of stone debris that break off during the manufacturing of stone tools. These are usually considered waste and are the by-product of production (also referred to as flake piece).

Flake: any piece of stone struck off a core and has a number of characteristics including ring cracks showing where the hammer hit the core and a bulb of percussion. May be used as a tool with no further working, may be retouched or serve as a platform for further reduction.

Flaked piece/waste flake: an unmodified and unused flake, usually the by-product of tool manufacture or core preparation (also referred to asdebitage).

Formation processes: human caused (land uses etc) or natural processes (geological, animal, plant growth etc) by which an archaeological site is modified during or after occupation and abandonment. These processes have a large effect on the provenience of artefacts or features.

Grinding stone: an abrasive stone used to abrade another artefact or to process food.

Hammer stone: a stone that has been used to strike a core to remove a flake, often causing pitting or other wear on the stone's surface.

Harm: is defined as an act that may destroy, deface or damage an Aboriginal object or place. In relation to an object, this means the movement or removal of an object from the land in which it has been situated

Holocene: the post-glacial period, beginning about 10,000 B.P.

In situ: archaeological items are said to be "in situ" when they are found in the location where they were last deposited.

Pleistocene: the latest major geological epoch, colloquially known as the "Ice Age" due to the multiple expansion and retreat of glaciers. Ca. 3.000, 000-10,000 years B.P.

Retouched flake: a flake that has been flaked again in a manner that modified the edge for the purpose of resharpening that edge.

Stratified Archaeological Deposits: Aboriginal archaeological objects may be observed in soil deposits and within rock shelters or caves. Where layers can be detected within the soil or sediments, which are attributable to separate depositional events in the past, the deposit is said to be stratified. The integrity of sediments and soils are usually affected by 200 years of European settlement and activities such as land clearing, cultivation and construction of industrial, commercial and residential developments.

Taphonomy: the study of processes which have affected organic materials such as bone after death; it also involves the microscopic analysis of tooth-marks or cut marks to assess the effects of butchery or scavenging activities.

Traditional Aboriginal Owners: Aboriginal people who are listed in the Register of Aboriginal owners pursuant to Division 3 of the *Aboriginal Land Register Act (1983)*. The Registrar must give priority to registering Aboriginal people for lands listed in Schedule 14 of the *National Parks and Wildlife Act 1974* or land subject to a claim under 36A of the *Aboriginal Land Rights Act 1983*.

Traditional Knowledge: Information about the roles, responsibilities and practices set out in the cultural beliefs of the Aboriginal community. Only certain individuals have traditional knowledge and different aspects of traditional knowledge may be known by different people, e.g. information about men's initiation sites and practices, women's sites, special pathways, proper responsibilities of people fishing or gathering food for the community, ways of sharing and looking after others, etc.

Typology: the systematic organization of artefacts into types on the basis of shared attributes.

Use wear: the wear displayed on an artefact as a result of use.

ACRONYMS

ACHA	Aboriginal Cultural Heritage Assessment
ACHMP	Aboriginal Cultural Heritage Management Plan
AHIMS	Aboriginal Heritage Information Management System
AHIP	Aboriginal Heritage Impact Permit

AHIMS SITE ACRONYMS

ACD	Aboriginal ceremonial and dreaming
AFT	Artefact (stone, bone, shell, glass, ceramic and metal)
ARG	Aboriginal resource and gathering
ART	Art (pigment or engraving)
BOM	Non-human bone and organic material
BUR	Burial
CFT	Conflict site
CMR	Ceremonial ring (stone or earth)
ETM	Earth mound
FSH	Fish trap
GDG	Grinding groove
HAB	Habitation structure
HTH	Hearth
OCQ	Ochre quarry
PAD	Potential archaeological Deposit
SHL	Shell
STA	Stone arrangement
STQ	Stone quarry
TRE	Modified tree (carved or scarred)
WTR	Water hole

1 INTRODUCTION

1.1 INTRODUCTION

McCardle Cultural Heritage Pty Ltd (MCH) has been engaged by Port Stephens Council to prepare an Aboriginal Cultural Heritage Assessment (ACHA), and an Aboriginal Heritage Impact Permit (AHIP), if requires, for the development of a Place Strategy for the Fullerton Cove area.

The assessment has been undertaken to meet the Heritage NSW, Department of Premier & Cabinet, Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010 (DECCW 2010), the Guide to Investigating, Assessing and Reporting on Aboriginal Cultural Heritage in NSW (OEH 2011), the Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales (DECCW 2010b), Councils' requirements and the brief.

After commencement of the ACHA, Council notified MCH that access for surveys had not been established and as such to provide a desk top assessment until the survey could be undertaken. This report is the desk top assessment with no surveys undertaken.

1.2 PROPONENT DETAILS

Port Stephens Council

1.3 THE PROJECT AREA

The project area is defined by the proponent and is located at Fullerton Cove. The location and extent of the project area is illustrated in Figures 1.1 to 1.3. The Lots/DPs and street addresses are listed in Table 1.1.

Figure 1.1 Regional location of the project area

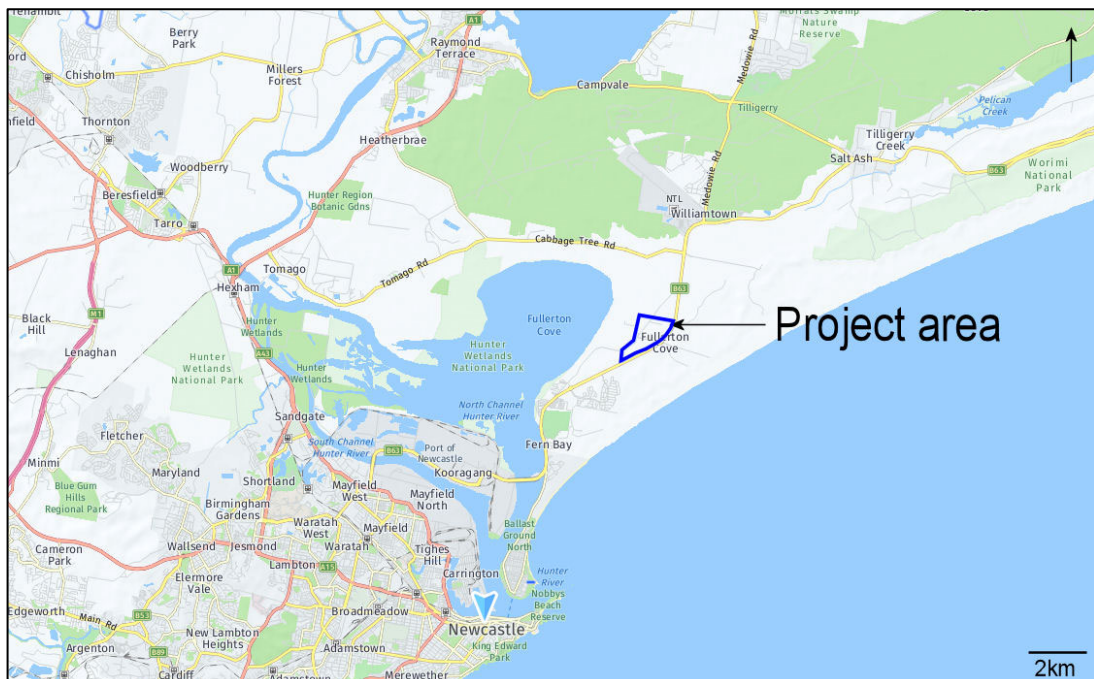


Figure 1.3 Local location of the project area

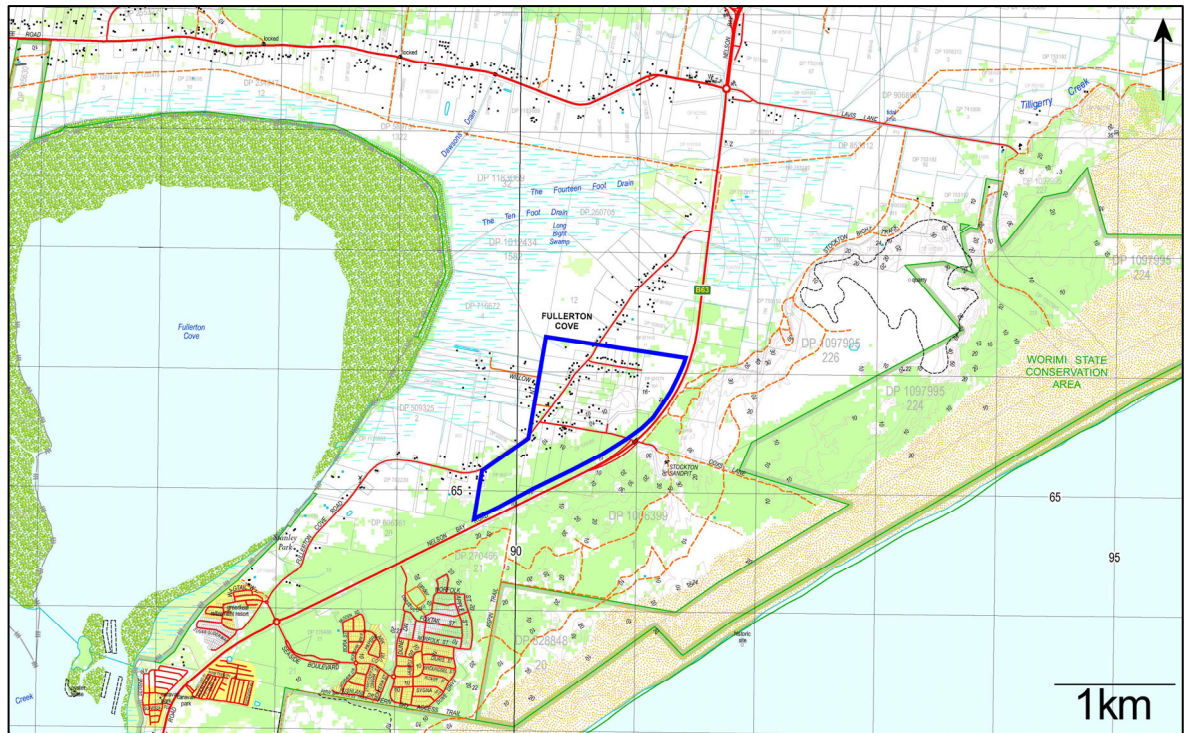


Figure 1.2 Aerial photograph of the project area (Nearmap 2022)



Table 1.1 Lots & DPs within the project area

Lot/DP	Address	Lot/DP	Address
Lot 1910 DP557701	3 Zircon Lane, Fullerton Cove	Lot 1 DP120634	12 Cocks Lane, Fullerton Cove
Lot 1 DP1006307	21 Cocks Lane, Fullerton Cove	Lot 143 DP555223	9 Cocks Lane, Fullerton Cove
Lot 43 DP1078218	360 Fullerton Cove Road, Fullerton Cove	Lot 1 DP724265	4 Cocks Lane, Fullerton Cove
Lot 5 DP1105459	8 Road 530 Fullerton Cove	Lot 3 DP661188	319 Fullerton Cove Road, Fullerton Cove
Lot 12 DP1123764	337 Fullerton Cove Road, Fullerton Cove	Lot 141 DP1003535	323 Fullerton Cove Road, Fullerton Cove
Lot 13 DP1123764	331 Fullerton Cove Road, Fullerton Cove	Lot 11 DP587276	345 Fullerton Cove Road, Fullerton Cove
Lot 1 DP1142113	3A Zircon Lane, Fullerton Cove	Lot 10 DP587276	351 Fullerton Cove Road, Fullerton Cove
Lot4 DP255734	5 George Street, Fullerton Cove	Lot 1 DP730147	334 Fullerton Cove Road, Fullerton Cove
Lot 21 DP738432	328 Fullerton Cove Road, Fullerton Cove	Lot 9 DP587276	363 Fullerton Cove Road, Fullerton Cove
Lot 22 DP738432	5 Cocks Lane, Fullerton Cove	Lot 1 DP798211	342 Fullerton Cove Road, Fullerton Cove
Lot 12 DP255734	6 George Street, Fullerton Cove	Lot 5 DP1288597	364A Fullerton Cove Road, Fullerton Cove
Lot 1 DP111519	16 Road 530 Fullerton Cove	Lot 1 DP502581	352 Fullerton Cove Road, Fullerton Cove

Lot 2 DP111519	14 Road 530 Fullerton Cove	Lot 8 DP587276	364 Fullerton Cove Road, Fullerton Cove
Lot 3 DP111519	12 Road 530 Fullerton Cove	Lot 2 DP255734	390 Fullerton Cove Road, Fullerton Cove
Lot 1 DP794575	10 Road 530 Fullerton Cove	Lot 1 DP242093	272A Fullerton Cove Road, Fullerton Cove
Lot 6 DP998656	6 Road 530 Fullerton Cove	Lot 1 DP716672	367 Fullerton Cove Road, Fullerton Cove
Lot 8 DP255734	14 George Street, Fullerton Cove	Lot 3 DP716672	373 Fullerton Cove Road, Fullerton Cove
Lot 9 DP255734	12 George Street, Fullerton Cove	Lot 2 DP716672	369 Fullerton Cove Road, Fullerton Cove
Lot 7 DP255734	11 George Street, Fullerton Cove	Lot 1581 DP574616	387 Fullerton Cove Road, Fullerton Cove
Lot 10 DP255734	10 George Street, Fullerton Cove	Lot 100 DP819758	306 Fullerton Cove Road, Fullerton Cove
Lot 6 DP255734	9 George Street, Fullerton Cove	Lot 101 DP819758	304 Fullerton Cove Road, Fullerton Cove
Lot 11 DP255734	8 George Street, Fullerton Cove	Lot 1 DP986242	272 Fullerton Cove Road, Fullerton Cove
Lot 5 DP255734	7 George Street, Fullerton Cove	Lot 71 DP876716	4 Road 530 Fullerton Cove
Lot 13 DP255734	4 George Street, Fullerton Cove	Lot 72 DP876716	1 Zircon Lane, Fullerton Cove
Lot 3 DP255734	3 George Street, Fullerton Cove	Lot 12 DP881613	8 Coxs Lane, Fullerton Cove
Lot 991 DP627179	16 George Street, Fullerton Cove	Lot 11 DP881613	10 Coxs Lane, Fullerton Cove
Lot 1 DP1006399	20 Coxs Lane, Fullerton Cove	Lot 1582 DP1012434	397 Fullerton Cove Road, Fullerton Cove
Lot 2 DP1006399	18 Coxs Lane, Fullerton Cove	Lot 1 DP255734	2 George Street, Fullerton Cove
Lot 8 DP742586	17 Coxs Lane, Fullerton Cove	Lot 14 DP255734	374 Fullerton Cove Road, Fullerton Cove
Lot 4 DP716672	383 Fullerton Cove Road, Fullerton Cove		

1.4 DESCRIPTION OF THE PROPOSED DEVELOPMENT

Council is presently undertaking the initial studies as part of the development of a Place Strategy for the Fullerton Cove area. A Place Strategy is a mechanism to look at the potential for land use changes that are not necessarily envisaged within existing strategic plans. Ultimately it is envisaged that this precinct will deliver new housing and retail/commercial facilities to assist in meeting Port Stephens housing needs. No works will be undertaken at this stage of the process.

1.5 PURPOSE OF THE ARCHAEOLOGICAL ASSESSMENT

The purpose of the assessment is to assess any archaeological constraints to support the proposal and to provide opportunities and options to ensure any cultural materials present are protected through appropriate mitigation and management.

1.6 OBJECTIVE OF THE ASSESSMENT

The objective of the assessment is to identify areas of Aboriginal cultural heritage value, to determine possible impacts on any Aboriginal cultural heritage identified (including potential subsurface evidence) and to develop management recommendations where appropriate. The assessment employs a regional approach, taking into consideration the landscape of the project area (landforms, water resources, soils, geology etc), the regional archaeological patterning identified by past studies, natural processes (e.g., erosion) as well as land uses and associated impacts across the landscape and any associated cultural that may be present.

1.7 PROJECT BRIEF/SCOPE OF WORK

The following tasks were carried out:

- a review of relevant statutory registers and inventories for indigenous cultural heritage including the Aboriginal Heritage Information Management System (AHIMS) for known archaeological sites, the State Heritage Register, the National Heritage List, the Commonwealth Heritage List, the National Trust Heritage Register and the relevant Local Environmental Plan;
- a review of local environmental information (e.g., topographic, geological, soil, geomorphological, vegetation, hydrology) to determine the likelihood of archaeological sites and specific site types that may be present, prior and existing land uses and associated impacts and site disturbance that may affect site integrity;
- a review of previous investigations to determine the extent of archaeological investigations in the area and identify any archaeological patterns;
- the development of a predictive archaeological model based on the data searches and literature review;
- identification of human and natural impacts in relation to the known and any new archaeological sites and archaeological potential within the project area;
- consultation with the Registered Aboriginal Parties (RAPs) as per the Aboriginal Cultural Heritage Consultation Requirements for Proponents (2010);
- undertake a site inspection with the participation of the RAPs, and
- the development of mitigation and conservation measures in consultation with the RAPs.

1.8 LEGISLATIVE CONTEXT

The following overview of the legislative framework, is provided solely for information purposes for the client, and should not be interpreted as legal advice. MCH will not be liable for any actions taken by any person, body or group as a result of this general overview and MCH recommends that specific legal advice be obtained from a qualified legal practitioner prior to any action being taken as a result of the general summary below.

Land managers are required to consider the effects of their activities or proposed development on the environment under several pieces of legislation. Although there are a number of Acts and regulations protecting Aboriginal heritage, including places, sites and objects, within NSW, the three main ones include:

- National Parks and Wildlife Act (1974, as amended)

- National Parks and Wildlife Regulation (2019)
- Environmental Planning and Assessment Act (1979)

1.8.1 NATIONAL PARKS AND WILDLIFE ACT (1974, AS AMENDED)

The National Parks and Wildlife Act (1974), Amended 2019, is the primary legislation for the protection of Aboriginal cultural heritage in New South Wales. The NPW Act protects Aboriginal heritage (places, sites and objects) within NSW and the protection of Aboriginal heritage is outlined in s86 of the Act, as follows:

- “A person must not harm or desecrate an object that the person knows is an Aboriginal object” s86(1)
- “A person must not harm an Aboriginal object” s86(2)
- “A person must not harm or desecrate an Aboriginal place” s86(4)

Penalties apply for harming an Aboriginal object, site or place. The penalty for knowingly harming an Aboriginal object (s86[1]) and/or an Aboriginal place (s86[4]) is up to \$550,000 for an individual and/or imprisonment for 2 years; and in the case of a corporation the penalty is up to \$1.1 million. The penalty for a strict liability offence (s86[2]) is up to \$110,000 for an individual and \$220,000 for a corporation.

Harm under the National Parks and Wildlife Act (1974, as amended) is defined as any act that; destroys defaces or damages the object, moves the object from the land on which it has been situated, causes or permits the object to be harmed. However, it is a defence from prosecution if the proponent can demonstrate that;

- 1) harm was authorised under an Aboriginal Heritage Impact Permit (AHIP) (and the permit was properly followed), or
- 2) the proponent exercised due diligence in respect to Aboriginal heritage.

The ‘due diligence’ defence (s87[2]), states that if a person or company has applied due diligence to determine that no Aboriginal object, site or place was likely to be harmed as a result of the activities proposed for the Project Area, then liability from prosecution under the NPW Act 1974 will be removed or mitigated if it later transpires that an Aboriginal object, site or place was harmed. If any Aboriginal objects are identified during the activity, then works should cease in that area and Heritage NSW, Department of Premier & Cabinet notified (DECCW 2010:13). The due diligence defence does not allow for continuing harm or as defence to s.86(1) or (4).

1.8.2 NATIONAL PARKS AND WILDLIFE REGULATION (2019)

The National Parks and Wildlife Regulation 2019 provides a framework for undertaking activities and exercising due diligence in respect to Aboriginal heritage. The Regulation (201909) recognises various due diligence codes of practice, including the Due Diligence Code of Practice for the Protection of Aboriginal Objects in NSW, but it also outlines procedures for Aboriginal Heritage Impact Permit (AHIP) applications and Aboriginal Cultural Heritage Consultation Requirements (ACHCRs); amongst other regulatory processes.

1.8.3 ENVIRONMENTAL PLANNING & ASSESSMENT ACT 1979 (EP&A ACT)

EP&A Act establishes the statutory framework for planning and environmental assessment in NSW and the implementation of the EP&A Act is the responsibility of the Minister for Planning, statutory authorities and local councils. The EP&A Act contains three parts which impose requirements for planning approval:

- Part 3 of the EP&A Act relates to the preparation and making of Environmental Planning Instruments (EPIs), State Environmental Planning Policies (SEPPs) and Local Environmental Plans (LEPs).
- Part 4 of the EP&A Act establishes the framework for assessing development under an EPI. The consent authority for Part 4 development is generally the local council, however the consent authority may be the Minister, the Planning Assessment Commission or a joint regional planning panel depending upon the nature of the development.
- Part 4, Division 4.1 of the EP&A Act establishes the assessment pathway for State significant Development (SSD) declared by the State Environmental Planning Policy (State and Regional Development) 2011 (NSW). Once a development is declared as SSD, the Secretary's Environmental Assessment Requirements (SEARs) will be issued outlining what issues must be considered in the EIS.
- Part 5 of the EP&A Act provides for the control of 'activities' that do not require development consent and are undertaken or approved by a determining authority. Development under Part 5 that are likely to significantly affect the environment is required to have an EIS prepared for the proposed activity.
- Part 5.1 of the EP&A Act establishes the assessment pathways for State Significant Infrastructure (SSI). Development applications made for SSI can only be approved by the Minister. Once a development is declared as SSI, the SEARs will be issued outlining what issues must be addressed in the EIS.

The applicable approval process is determined by reference to the relevant environmental planning instruments and other controls, LEPs and State Environmental Planning Policies (SEPPs). This project falls under Part 3.

1.9 QUALIFICATIONS OF THE INVESTIGATOR

Dr. Penny McCardle: Principal Archaeologist & Forensic Anthropologist has 22 years experience in Indigenous archaeological assessments, excavation, research, reporting, analysis and consultation and 19 years in skeletal identification, biological profiling and skeletal trauma identification for NPWS, NSW Police and the NSW Department of Forensic Medicine.

- BA (Archaeology and Palaeoanthropology): Indigenous archaeology, University of New England 1999
- Hons (Archaeology and Palaeoanthropology): Physical Anthropology, University of New England 2001
- Forensic Anthropology Course, University of New England 2003
- Armed Forces Institute of Pathology Forensic Anthropology Course, Ashburn, VA 2008
- Analysis of Bone trauma and Pseudo-Trauma in Suspected Violent Death Course, Erie College, Pennsylvania, 2009
- Documenting Scenes of War and Human Rights Violations. Institute for International Criminal

Investigations, 2018

- PhD, University of Newcastle, 2019

1.10 REPORT STRUCTURE

The report includes Section 1 which outlines the project, Section 2 provides the consultation, Section 3 presents the environmental context, Section 4 presents cultural context, Section 5 the ethno historic context and Section 6 provides the archaeological background.

DRAFT

2 CONSULTATION

As per the Heritage NSW, Department of Premier & Cabinet Aboriginal Cultural Heritage Consultation Requirements for Proponents (April 2010), MCH followed the four stages of consultation as set out below. All correspondences for each stage are provided in Appendix A.

In relation to cultural significance, MCH recognises and supports the indigenous system of knowledge. That is, that knowledge is not 'open' in the sense that everyone has access and an equal right to it. Knowledge is not always definitive (in the sense that there is only one right answer) and knowledge is often restricted. As access to this knowledge is power, it must be controlled by people with the appropriate qualifications (usually based on age seniority, but may be based on other factors). Thus, it is important to obtain information from the correct people: those that hold the appropriate knowledge of those sites and/or areas relevant to the project. It is noted that only the Aboriginal community can identify and determine the accepted knowledge holder(s) may be not archaeologists or proponents. If knowledge is shared, that information must be used correctly and per the wishes of the knowledge holder.

Whilst an archaeologist may view this information as data, a custodian may view this information as highly sensitive, secret/sacred information and may place restrictions on its use. Thus, it is important for MCH to engage in affective and long-term consultation to ensure knowledge is shared and managed in a suitable manner that will allow for the appropriate management of that site/area. MCH also know that archaeologists do not have the capability nor the right to adjudicate on the spirituality of a particular location or site as this is the exclusive right of the traditional owners who have the cultural and hereditary association with the land of their own ancestors. For these reasons, consultation forms an integral component of all projects and this information is sought from the registered stakeholders to be included in the report in the appropriate manner that is stipulated by those with the information.

2.1 STAGE 1: NOTIFICATION & REGISTRATION OF INTEREST

The aim of this stage is to identify, notify and register Aboriginal people and/or groups who hold cultural knowledge that is relevant to the project area, and who can determine the cultural significance of any Aboriginal objects and/or places within the proposed project area. In order to do this, the sources identified by Heritage NSW, Department of Premier & Cabinet (OEH 2010:10) and listed in Table 2.1, to provide the names of people who may hold cultural knowledge that is relevant to determining the significance of Aboriginal objects and/or places were contacted by letter on 28th November 2022 and it was stipulated that if no response was received, the project and consultation will proceed. Information included in the correspondence to the sources listed in Table 2.1 included the name and contact details of the proponent, an overview of the proposed project including the location and a map showing the location.

Table 2.1 Sources contacted

Organisations contacted	Response
Heritage NSW	30 groups
WLALC	4 groups
Port Stephens Council	5 groups
Registrar Aboriginal Land Rights Act 1983	no response
National Native Title Tribunal	no claims
Native Title Services Corporation Limited	no response
Local Land Services	no response

Following this, MCH compiled a list of people/groups to contact (Refer to Appendix A). As per the Aboriginal cultural heritage consultation requirements for proponents (April 2010), archaeologists and proponents must write to all those groups provided asking if they would like to register their interest in the project. Unfortunately, some Government departments written to requesting a list of groups to consult with do not differentiate groups from different traditional boundaries and provide an exhaustive list of groups from across the region including those outside their traditional boundaries.

MCH wrote to all parties identified by the various departments on 13th December 2022, and an advertisement was placed in the Port Stephens Examiner on 15th December 2022. The correspondence and advertisement included the required information as per the Aboriginal Cultural Heritage Consultation Requirements for Proponents (April 2010) and requested to nominate the preferred option for the presentation of information about the proposed project: an information packet or a meeting and information packet (Refer to Stage 2). The Registered Aboriginal Parties (RAPs) are listed in Table 2.2.

Table 2.2 Registered Aboriginal Parties

RAP	Contact
A1 Indigenous Services	Carolyn Hickey
Widescope Indigenous Group	Steven Hickey
Nur-Run-Gee Pty Ltd	Leonard Anderson OAM
Mur-Roo-Ma Inc.	Anthony Anderson
Worimi Local Aboriginal Land Council	Jamie Merrick
Karuah Indigenous Corporation	David Feeney
Gomery Cultural Consultants	Dave Horton

2.2 STAGE 2: PRESENTATION OF INFORMATION

The aim of this stage is to provide the RAPs with information regarding the scope of the proposed project and the Indigenous cultural heritage assessment process.

As the RAPs did not provide their preferred method of receiving information, an information packet was sent to all RAPs and included the required information as per the Aboriginal Cultural Heritage Consultation Requirements for Proponents (April 2010). The pack included the required information as per the Aboriginal Cultural Heritage Consultation Requirements for Proponents (April 2010) and a written response to the proposed methods was due no later than 2nd February 2023.

The information pack also stipulated that consultation was not employment, and requested that in order to assist the proponent in the engagement of field workers, that the groups provide information that will assist in the selection of field staff who may be paid on a contractual basis. This included, but was not limited to, experience in field work and in providing cultural heritage advice and their relevant experience; and to provide a CV and insurance details.

The information pack also noted that failure to provide the required information by the date required (28 days) will result in a missed opportunity for the RAPs to contribute to their cultural heritage and the project will proceed.

2.3 STAGE 3: GATHERING INFORMATION ABOUT CULTURAL SIGNIFICANCE

The aim of this stage is to facilitate a process whereby the RAPs may contribute to culturally appropriate information gathering and the research methodology, provide information that will enable the identification of the cultural significance of any Aboriginal objects and or/places within the proposed project area, and have input into the development of any cultural heritage management and mitigation measures. In order to do this, included in the information pack sent for Stage 2, was information pertaining to the gathering of cultural knowledge. This included the following information;

- MCH noted that information provided by RAPs may be sensitive and MCH and the proponent will not share that information with all RAPs or others without the express permission of the individual. MCH and the proponent extended an invitation to develop and implement appropriate protocols for sourcing and holding cultural information including any restrictions to place on information, as well as the preferred method of providing information;
- request for traditional/cultural knowledge or information associated with ceremonial, spiritual, mythological beliefs, traditions and known sites from the pre-contact period;
- request for traditional/cultural knowledge or information regarding sites or places with historical associations and/or cultural significance which date from the post-contact period and that are remembered by people today (e.g., plant and animal resource use areas, known camp sites); and
- request for traditional/cultural knowledge or information in relation to any sites or places of contemporary cultural significance (apart from the above) which has acquired significance recently.

During this process, Nur-Run Gee Pty Ltds requested a meeting with all parties to discuss the project and address the non-Worimi RAPs.

2.4 STAGE 4: SURVEY

All RAPs were notified of the delay for the survey due to access issues.

3 LANDSCAPE AND ENVIRONMENTAL CONTEXT

3.1 INTRODUCTION

Documenting and understanding the context of archaeological sites in relation to surrounding terrain features is essential to landscape archaeological studies worldwide (De Reu et al., 2011; De Smedt et al., 2013; Turrero et al., 2013) and the nature and distribution of Aboriginal cultural materials in a landscape are strongly influenced by environmental factors such as topography, geology, landforms, climate, geomorphology, hydrology and the associated soils and vegetation (Hughes and Sullivan 1984). These factors influence the availability of plants, animals, water, raw materials, the location of suitable camping places, ceremonial grounds, burials, and suitable surfaces for the application of rock art. As site locations may differ between landforms due to differing environmental constraints that result in the physical manifestation of different spatial distributions and forms of archaeological evidence, these environmental factors are used in constructing predictive models of Aboriginal site locations, based on the assumption that the environment provided constraints and opportunities that influenced such behaviour in relation to site selection and use.

Environmental factors also effect the degree to which cultural materials have survived in the face of both natural and human influences and affect the likelihood of sites being detected during ground surface survey. Site detection is dependent on a number of environmental factors including surface visibility (which is determined by the nature and extent of ground cover including grass and leaf litter etc) and the survival of the original land surface and associated cultural materials (by flood alluvium, erosion etc). It is also dependant on the exposure of the original landscape and associated cultural materials by human impacts (e.g., Aboriginal fire stick farming, clearing, logging, agricultural activities, construction works, mining etc), (Hughes and Sullivan 1984). Combined, these processes and activities are used in determining the likelihood of both surface and subsurface cultural materials surviving and being detected.

It is therefore necessary to understand the environmental factors, processes and activities, all of which affect site location, preservation and detection during surface survey and the likelihood of in situ subsurface cultural materials being present. The environmental factors, processes and disturbances of the surrounding environment and specific project area are discussed below.

3.2 GEOLOGY

The underlying regional geology plays a major role in the structure of the surrounding environment (e.g., landforms, topography, geomorphology, vegetation, climate, hydrology etc), and also influences patterns of past occupation and their manifestation in the archaeological record. This is primarily relevant to past Aboriginal land use in regard to the location of stone resources or raw materials and their procurement for the manufacturing and modification of stone tools.

The underlying geology of the project area is Quaternary gravel, sand silt and clay with "Waterloo Rock; and marine and fresh water deposits (Newcastle 1:250,000 Geological Map Series, 1966). The absence of raw materials for the manufacturing of stone tools (e.g., mudstone, tuff, silcrete) are absent from the project area.

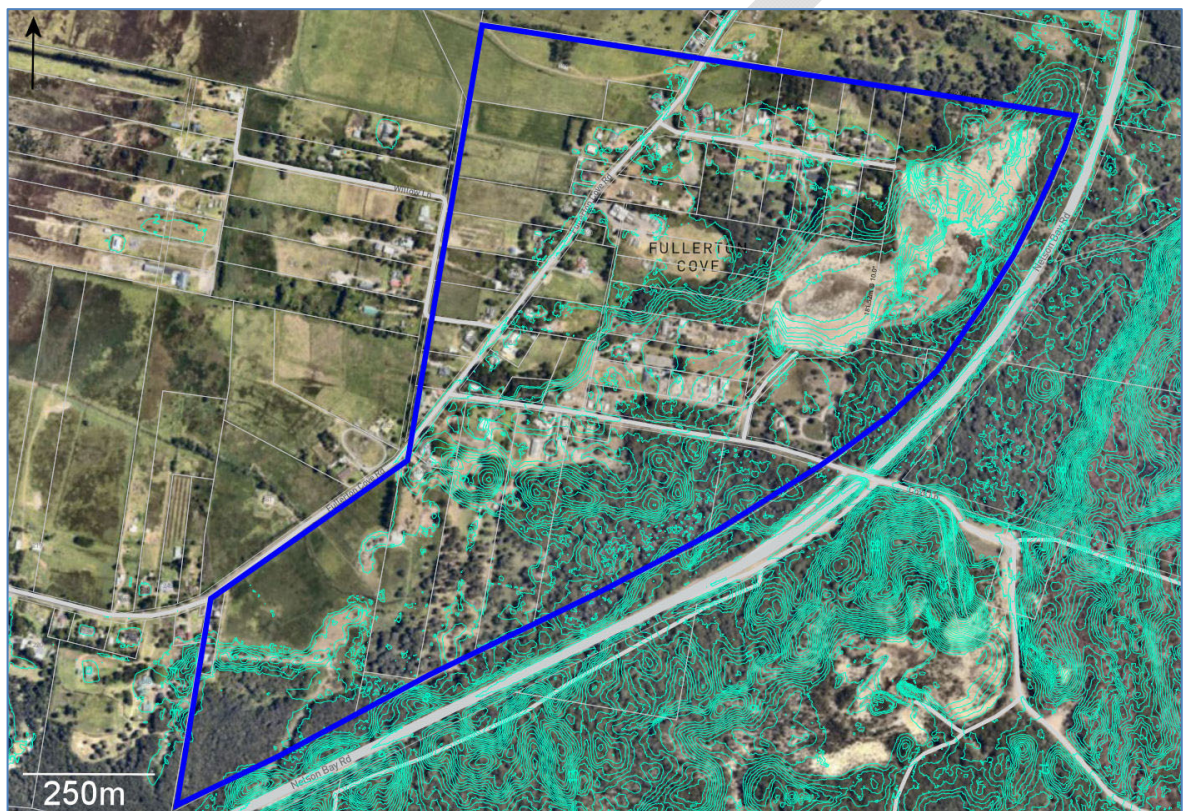
3.3 TOPOGRAPHY

The topographical context is largely determined by the geology and is important to identify potential factors relating to past Aboriginal land use patterns as not all landforms are suitable camping

locations, suitable for the application of rock art etc. Land systems, along with a range of environmental factors (e.g., geology, soils, hydrology, impacts) are used in developing predictive models of past Aboriginal land use and site selection. Story et al (1963) divided the Hunter Valley into eight main sub-regions including the Southern Mountains, Central Goulburn Valley, Merriwa Plateau, Liverpool and Mt Royal Ranges, Barrington tops, North-Eastern Mountains, Central lowlands and the Coastal Zone.

The study area is situated in Coastal Zone with the majority of the project area consisting of dunes (back barrier sand flats and dune formations of Holocene age) and the north west and south west consisting of low lying swamp lands (Figure 3.1).

Figure 3.1 Contours/topography of the project area



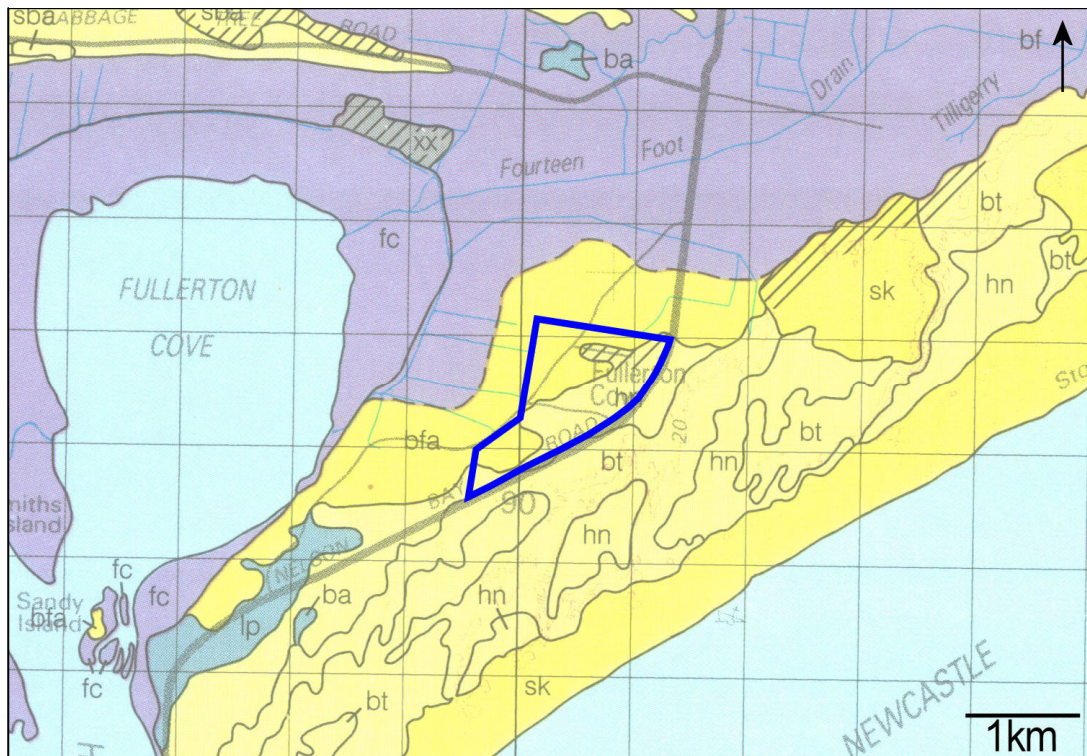
3.4 SOILS

The nature of the surrounding soil landscape also has implications for Aboriginal land use and site preservation, mainly relating to supporting vegetation and the preservation of organic materials, the location and age of cultural materials.

Past human actions impact the soil record, as seen through changes in soil characteristics, changes to sedimentation, and the presence of archaeological features and artefacts preserved within modern soils. Soil and sediment conditions control what survives in the burial environment, what decomposes, and consequently influence all archaeological sites, artefacts, and biological remains. Soils have formed under the continuous influence of people, up to the present day, when most land is actively managed for agriculture, pastoral, forestry, extraction or construction.

Soils may also be impacted on by natural agencies. The deposit of alluvial and aeolian sediments and colluvium movement of fine sediments (including artefacts) results in the movement and

Figure 3.2 Soil landscapes of the project area



The Boyces Track soil landscape consists of steep Quaternary Holocene sand dunes on the Tomago Coastal Plain. Local relief is 10-30m, slopes are >25% and elevation is 10-40m. The area consists of uncleared tall, open forest. The topsoil (A1 horizon) is speckled loose loamy sand that is commonly brownish grey (10Yr 4/1), moderate to slightly acidic (pH 5.0-6.0) and has few charcoal fragments. This overlays the A2 horizon that consists of bleached loose sand that is greyish yellow brown (10YR 5/2) to light grey (10YR 7/1, 10YR 8/1) and dry colours are usually bleached light grey (10YR 7/1, 10YR 8/1). Soils are slightly acid to neutral (pH 6.0-7.0) and few charcoal fragments are present. This then overlays the B horizon consisting of faintly mottled sand that is a mixture of dark brown (10YR 4/3) or brown (10YR 4/4) mottles in a background colour of dull yellow orange (10YR 6/4). Soils are slightly acid to neutral (6.0-7.0). This then overlies the C horizon (parent material) that includes loose

dull yellow orange sand (10YR 6/4) that is also slightly acid to neutral (6.0-7.0). Generally, there is up to 40cm of the A1 horizon, that overlies up to 100cm of the A2 horizon. This then overlies up to 50cm of the B horizon and >500cm of the C horizon. Boundaries are clear except for B/C horizons which are diffused (Matthei 1995, 202:204)

Disturbed soil landscapes are dominated by ground surfaces arising from human activity. Soil parent materials have been moved, accumulated, removed or replaced (with soil or other items). Landform elements include fill-tops, embankments, cut faces, cut-over surfaces, dams, mounds and pits.

3.5 GEOMORPHOLOGY

Geomorphology is the study of landscapes, their evolution and the processes operating within earth systems. Cultural remains are part of these systems, having being deposited on, and in part, resulting from interactions within landscapes of the past. An understanding of geomorphological patterning and alterations is therefore essential in assess and interpreting the archaeological record.

The project area is part of the Newcastle Bight sand barrier system, which is bounded in the east and south by the Hunter River and to the north by the bedrock hill slopes at Raymond Terrace (Thom et al. 1992, Matthei 1995). The system incorporates both inner (Pleistocene: c.1.8 million to 10,000 years ago) and outer (Holocene: 10,000 years ago, to today) coastal barriers as well as the inter barrier depression system. Sediments include marine, estuarine aeolian and paludal deposits. In addition to the beach ridges behind Stockton Bight there are three sets of transgressive dunes, two of which (landward) have been stabilised by natural vegetation, and the third (coastward) remains transgressive (Robson et al. 1993: 7). Between the inner and the outer barrier is a large inter-barrier depression that is followed by Tilligerry Creek and was originally an extensive lagoon. It is now filled with either estuarine or fresh water swamp deposits, mud and clay and natural shell beds (Robson et al 1993: 7). All of the barrier sands identified as the Tomago sand beds have been mined for heavy minerals in places and are also an important source of groundwater tapped by the Hunter Water Board.

Although there has been a long history of geomorphic study of the barrier systems in this region dating back to Thom (1965) and their evolution has been determined, it is important to note that in recent years the Pleistocene/Holocene coastal chronology has been substantially modified and therefore the conventional model of inner and outer barriers needs to be reconsidered. Recent research has concluded that the dominant source and driver of sand to supply the barrier systems along the NSW coast were the shorefore disequilibrium during Holocene sea-level transgression, with a convex shoreface sand body providing the necessary conditions for onshore-directed sand supply by wave processes (Kinsela et al. 2016).

Stockton Bight is a large exposed south-facing embayment that has acted as a major sediment trap, resulting in a larger than average barrier for the region. It is also, together with the Myall Lakes system, the highest energy and most dynamic system on the NSW coast (Short 2020). The conventional understanding of the geomorphic evolution of the coast in this region is that the inner Pleistocene barrier was deposited during the last Inter Glacial period of high sea level (approximately 120,000 years ago) and was later modified by wind erosion and the development of transgressive sand sheets and freshwater swamps on its western margin. The inner barrier blocked off several valleys to form extensive swamps including the former Grahamstown Swamp that is now beneath the artificial Grahamstown Lake. At the height of the Last Glacial (circa 18,000 years before present [BP]), the sea level rose rapidly sweeping shelf sand before it to form the parallel sets of beach ridges and swales of the outer Holocene barrier. It is usually accepted that the sea level reached

its present height about 6,000 years BP and that this date marks the beginning of Holocene sand accumulation. The last 3,000 years have seen diminished geomorphic activity, with the most dramatic events being surges of aeolian action behind open-coast beaches. This phenomenon is thought to have initiated the transgressive behaviour noted in dunes along the eastern seaboard dated to around 800 to 250 years ago. More recently the severe storms of 1974 “cracked” the Newcastle Bight foredune, destabilising the landward side and initiating a blowout formation (GBAC 2010).

Young et al. (1993) seriously questioned the conventional model of coastal barrier development and suggested an alternate interpretation with four important elements:

1. That the sea level was at its present height by 7,000 years BP and that it rose another two metres until about 1,500 years BP;
2. Holocene transgressive dune activity varies from place to place and was a consequence of climate variation rather than sea level change;
3. That there was a fall of 2°C in sea surface temperature after 3,000 years BP and this coincided with the onset of the present phase of barrier erosion; and
4. That there is evidence of the effects of at least three tsunamis on the NSW south coast in the last 3,000 years.

In later work, several of the same authors (Bryant et al., 1997; Haworth et al., 2002) confirmed that barrier formation on the NSW coast extended over 250,000 years with several phases of development and destruction. They also found evidence of remnants of the “inner barrier” on the south coast with a peak phase of development at about 125,000 years BP when sea level was slightly higher than present. Their suggested explanation of the general absence of the inner barrier on the south coast is that such deposits were destroyed by tsunami, particularly one that occurred between 100,000-110,000 years BP. Murray-Wallace (2002) provided additional support for a prolonged history of barrier development in reporting sea levels for the New South Wales coast at Oxygen Isotope Stage 5 (last interglacial, 125,000 years BP) as being consistently about four metres above present sea level. This is within the range of sea levels reported in many other parts of Australia for the last eleven inter-glacials. In applying these points to the Newcastle Barriers, it should be noted that:

- The landward parts of the inner barrier may be substantially older than previously appreciated’
- That a mid-Holocene higher sea level could have an important influence on erosion and deposition of the outer barrier and on sediments and features in the Hunter estuary;
- That the ages of transgressive dune sheets need not be coincident from place to place; and
- That evidence of tsunami may also occur on the north coast.

The project area is predominantly located on Holocene dunes with the north western and south western sections, the interbarrier depression (Figure 3.3). The difference between the degree of soil development on inner and outer barrier sands can be attributed to the difference in age and the period of profile leaching. Periods of active dune movement may either re-work and effectively destroy archaeological sites or bury older land surfaces and potentially present sites. Although there is a good potential for in-situ sites in stable dune areas (both in Holocene and Pleistocene dunes), a range of other preservation factors including wind and water erosion, groundwater fluctuation and European disturbance may have influenced local site patterning.

Figure 3.3 Geomorphological map of the project area



More recently, Mitchell and Lillis (in prep) undertook an archaeological desktop sensitivity mapping and geomorphological assessment within the probable maximum flood (PMF) boundaries at various locations throughout the Hunter Valley region including the Hunter Estuary and inter-barrier environment along Tilligerry Creek. The objective of the assessment was to consider the known and potential Aboriginal cultural heritage sites within these locations in relation to past land uses and the potential effects of climate change. The findings in relation to known and potential Aboriginal sites for each of the landscapes within the investigation is summarised here.

The estuarine plan landscape is identified as an extensive area shared between Newcastle City and Port Stephens Shire. It included all of the Hunter River estuary, the lower reaches of the Williams River, the Port of Newcastle and almost all of the inner coastal barrier. Subaqueous landforms were assessed as unlikely to contain Aboriginal sites and bars, beach and shoreline ridge areas were assessed as having the potential to contain shell middens and burials. It was also argued that the estuarine swamps had swamp soils that could preserve organic artefacts and possible traces of eel channels/drains and areas of cultural significance were noted as possible. Estuarine plain areas were considered to only have limited archaeological potential.

Labelled as the Newcastle and estuary, Mitchell and Lillis (in prep) identified that the wetlands surrounding Fullerton Cove had been modified by levee and drain construction with concentrations of natural shell exposed in drains. Tilligerry Creek was noted as having large deposits of modern oyster shell, and it was noted this should not be confused with Aboriginal shell middens.

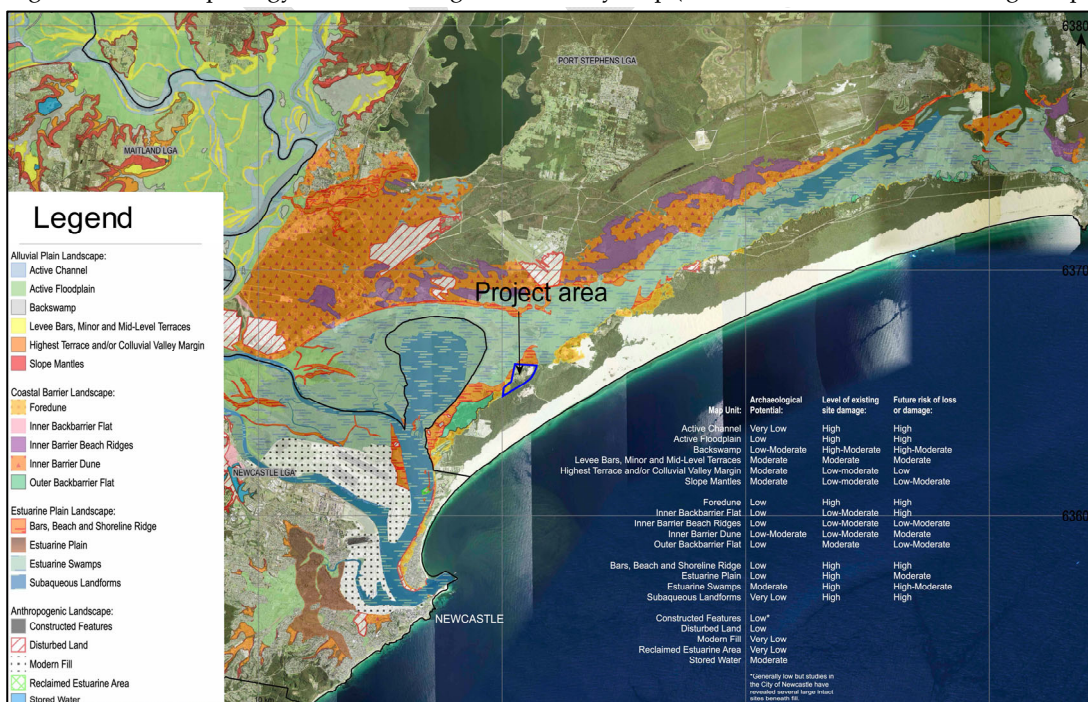
The coastal barrier landscape unit incorporates two barriers of beach ridges, sand dunes and associated drainage systems, local relief is generally <10m but transgressive dunes in the outer barrier reach 40-50m ASL. Beach areas were assessed as areas where reworked artefacts had the potential to occur and the foredunes were considered to be locations where reworked artefacts and burials could occur. Outer backbarrier flats were considered to contain isolated artefacts only. Inner-barrier dunes were assessed as having the potential to contain open sites, middens, burials and culturally modified trees and the inner-barrier beach ridges and inner backbarrier flats were assessed as only likely to contain isolated artefacts.

The inner and outer barrier landform consists of the inner barrier (inland) (32 kilometres long) and attached to bedrock at Tanilba/Mallabula and Hexham. Ground penetrating radar surveys suggested that the barrier was not homogenous, with intervals of shoreline progradation interspersed with channel deposits. It was also noted that some shoreline disjuncts could preserve Aboriginal sites in subsurface deposits. The outer barrier was similar in stratigraphy to the inner barrier in containing a topographically lower, transgressive facies with marine shells, and an overlying regressive facies of beach ridges and dunes. The outer barrier began to accumulate marine sand in the early Holocene and extended from Stockton for 34 kilometres to Morna Point at Anna Bay. Approximately 200 Aboriginal sites were exposed and eroded in the mobile dunes, with the potential for further unknown sites to be present in less disturbed sections or covered by drifting sand.

Land between the two barriers is occupied by Tilligerry Creek and an excavated drain that almost connected Fullerton Cove to Port Stephens. On the coastal side of the creek a back barrier flat was formed by storm wave wash over deposition at the time when the outer barrier was first formed. There are Aboriginal middens along the creek which contain both estuarine and open ocean species with reported dates of 2,000 to 3,000 Before Present (BP). Both barriers had been occupied and used by Aboriginal people. Aboriginal people would not have used the inner barrier as it was forming as those pre-dates the presence of Aboriginal people, but it was stated that they definitely occupied it in later periods. The beach ridges in the inner-barrier provided well defined, dry, routes through the sand dune country and it was assessed as likely that they may contain important, as yet unidentified, sites.

Figure 3.4, provides the archaeological sensitivity map (adapted from Mitchell, Lillis and Virtus Heritage in prep, Figure 47). As illustrated in Figure 3.4, The project area is mainly excluded from the study area, However, a small section in the south east is located on Holocene fordunes with estuarine plain landscape to the north and west.

Figure 3.4 Geomorphology and archaeological sensitivity map (Mitchell, Lillis & Virtus Heritage, in prep)



Located in close proximity to the interbarrier depression along the north and western sides of the project area, the project area is located approximately 1.3 kilometres west of the ocean. Being located in between such resource rich environments, the backbarrier flats and dunes provided reduced

resources that would have not have allowed for large scale camping but would have supported small to medium sized groups of people for hunting and gathering as well as travel in between these two resource rich environments.

3.6 CLIMATE

Climatic conditions would also have played a part in past occupation of an area as well as impacted upon the soils and vegetation and associated cultural materials. Rainfall throughout the area is summer-autumn dominated with minimum rainfall occurring during late winter and early spring. Average annual rainfall is highest along the coast (1,142mm) and decreases westwards (913mm). The maximum monthly rainfall occurs along the coast during March and the average minimum occurs in July and August. Average monthly maximum temperatures are highest in the west (29^o in December and January) and the average minimum being 4^oC in July (Matthei 1995:5). During summer, the increased rainfall rate and reduced ground cover is reflected in a proportionately higher risk of erosion.

3.7 WATERWAYS

One of the major environmental factors influencing human behaviour is water as it is essential for survival and as such people will not travel far from reliable water sources. In those situations where people did travel far from reliable water, this indicates a different behaviour such as travelling to obtain rare or prized resources and/or trade. Proximity to water not only influences the number of sites likely to be found but also artefact densities. The highest number of sites and the highest density are usually found in close proximity to water and usually on an elevated landform. This assertion is undisputedly supported by both the regional and local archaeological, where by such patterns have been identified and sites are typically within 50 metres of a reliable water source in the valley landforms and up to 100 metres in the sandstone country.

The main types of water sources include permanent (rivers and soaks), semi-permanent (large streams, swamps and billabongs), ephemeral (small stream and creeks) and underground (artesian). Stream order assessment is one way of determining the reliability of streams as a water source. Stream order is determined by applying the Strahler method to 1:25 000 topographic maps. Based on the climatic analysis, the project area will typically experience comparatively reliable rainfalls under normal conditions and thus it is assumed that any streams above a third order classification will constitute a relatively permanent water source.

The Strahler method dictates that upper tributaries do not exhibit flow permanence and are defined as first order streams. When two first order streams meet, they form a second order stream. Where two-second order streams converge, a third order stream is formed and so on. When a stream of lower order joins a stream of higher order, the downstream section of the stream will retain the order of the higher order upstream section (Anon 2003; Wheeling Jesuit University 2002).

When assessing the relationship between sites and water sources it is noted that the Australian continent has undergone significant environmental changes during the past 60,000 years that people have lived here and that Pleistocene sites (older than 10,000 years) would have been located in relation to Pleistocene water sources that may not exist today.

Examination of the Newcastle 1:25,000 topographic map and Nearmap indicates that the north western portion of the project area is situated within the interbarrier depression and the remainder consisting of Holocene dunes. The resource rich inter-barrier depression or swamp (previous lagoon/estuary) was a major source of subsistence resources. The area was very well resourced in terms of fresh water and associated resources as well as marine resources. The interbarrier

depression was clearly favoured for hunting and gathering with little to no evidence of past Aboriginal land uses within the interbarrier depression itself, but the elevated dunes overlooking the interbarrier depression and the beach areas having being favoured for camping in close proximity to these resources.

3.8 FLORA AND FAUNA

The availability of flora and associated water sources affect fauna resources, all of which are primary factors influencing patterns of past Aboriginal land use and occupation. The assessment of flora has two factors that assist in an assessment including a guide to the range of plant resources used for food and medicine and to manufacture objects including nets, string bags, shields and canoes which would have been available to Indigenous people in the past. The second is what it may imply about current and past land uses and to affect survey conditions such as visibility, access and disturbances.

European settlers extensively cleared much of the original native vegetation from the project area and is now dominated by introduced grasses with portions of the project area (southern portion mid-section and small parcels in the northern portion) including open woodland.

The drainage throughout the project area would have supported a limited range of faunal populations including kangaroo, wallaby, goanna, reptiles and a variety of birds. A wider variety of resources would have been available in areas close to the interbarrier depression.

3.9 LAND USES AND DISTURBANCES

Heritage NSW (DECCW 2010) defines disturbed lands as land that has been the subject of human activity that has changed the lands' surface and, or the subsurface, these changes being changes that remain clear and observable. Examples may include ploughing, construction works (roads, tracks, fire trails, dams, fences, clearing, utilities and infrastructure). This definition is based on the types of disturbances classified in The Australian Soil and Land Survey Field Handbook (CSIRO 2010) and Table 3.1 provides a scale formulated by the CSIRO of the levels of disturbances and their classification, which will assist in determining the level of disturbance across the project area and its impact on potential cultural material that may be present. These disturbances on the landscape have been thoroughly examined and recorded through numerous experiments (see below) in a variety of landforms throughout the world, along with the impacts on objects within the deposits.

Table 3.1 Land use scale (CSIRO 2010)

Minor disturbance		Moderate disturbance		Major disturbance	
Cleared and/or grazed at some time, but apparently never ploughed		Cleared and/or grazed at some time, with ploughing also attested		Severe disturbance to natural soil profiles; complete-to-near complete topsoil loss/disturbance	
0	No effective disturbance; natural	3	Extensive clearing (e.g., poisoning and ringbarking)	6	Cultivation: grain fed
1	No effective disturbance other than grazed by hoofed animals	4	Complete clearing; pasture native or improved, but never cultivated	7	Cultivation: irrigated, past and present

2	Limited clearing (e.g., selected logging)	5	Complete clearing: pasture native or improved, cultivated at some stage	8	Highly disturbed: e.g., quarry, road works, mining, landfill, urban
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Based upon archaeological evidence, the occupation of Australia extends back some 40,000 years (Mulvaney and Kamminga 1999). Although the impact of past Aboriginal occupation on the natural landscape is thought to have been relatively minimal, it cannot simply be assumed that 20,000 years of land use have passed without affecting various environmental variables. The practice of 'firestick farming' whereby the cautious setting of fires served to drive game from cover, provide protection and alter vegetation communities significantly influenced seed germination, thus increasing diversity within the floral community.

Following European settlement of the area in the 1820s, the regional landscape has been subjected to a range of different modifactory activities including extensive logging and clearing, agricultural cultivation (ploughing), pastoral grazing, residential developments and mining (Turner 1985). The associated high degree of landscape disturbance has resulted in the alteration of large tracts of land and the cultural materials contained within these areas. Based on aerial photography (Nearmap 2000 – 2021), the project area has been subject to a range of both moderate and high landuses disturbances and impacts. The project area has been cleared and primarily used for pastoral purposes (grazing) and agricultural activities, involving the wholesale clearance of native vegetation, the introduction of pasture grass, the construction of dams, housing, fencing, numerous tracks and associated infrastructure (water, electricity, telephone). The north eastern portion of the project area has also been subject to extensive sand mining (Lot 1910 DP557701 and Lot 991 DP627179) that has extended into the eastern portions of Lot 3 DP111519 and Lot 1 DP 794575. Sid Fogs coach yard, sheds and parking area is located at Lot 8 DP587276 and extends into the western portions of Lot 3 DP111519 and Lot 1 DP 794575. The remainder of the project area appears to include hobby farms and pastoral land. These landuses and how they impact on the landscape and deposits are discussed below.

In terms of these land uses and impacts on the landscape and cultural materials that may be present, early vegetation clearing included the uprooting of trees by chaining which will disturbed or destroy that may be present near, or underneath trees and vegetation (Wood 1982). Farming and agricultural activities also disturbed the landscape. Although pastoralism is a comparatively low impact activity, it does result in disturbances due to vegetation clearance and the trampling and compaction of grazed areas. These factors accelerate the natural processes of sheet and gully erosion, which in turn can cause the horizontal and lateral displacement of artefacts. Furthermore, grazing by hoofed animals can affect the archaeological record due to the displacement and breakage of artefacts resulting from trampling (Yorston et al 1990). Pastoral land uses are also closely linked to alterations in the landscape due to the construction of dams, fence lines and associated structures.

As a sub-set of agricultural land use, ploughing typically disturbs the top 10-12 centimetres of topsoil (Koettig 1986) depending on the method and machinery used during the process. Ploughing increases the occurrence of erosion and can also result in the direct horizontal and vertical movement of artefacts, thus causing artificial changes in artefact densities and distributions. In fact, studies undertaken on artefact movement due to ploughing (e.g., Roper 1976; Odell and Cowan 1987) has shown that artefacts move between one centimetre up to 18 metres laterally depending on the equipment used and horizontal movement. Ploughing may also interfere with other features and disrupt soil stratigraphy (Lewarch and O'Brien 1981), all of which result in a disturbed deposit, which, depending on the depth of soils, may result in no site integrity remaining. Ploughing

activities are typically evidenced through 'ridges and furrows' however a lengthy cessation in ploughing activities dictates that these features may no longer be apparent on the surface.

Excavation works required for developments, including but not limited to business, residential, industrial, aviation, works depots, mining, dams and associated infrastructure and utilities, require excavation, cut and fill methods. Remediation works also result in additional impacts and typically involve the removal of soils. These direct impacts to the land and associated cultural materials that may be present are easy to see and understand. Any form of construction or resource exploitation that involves the removal of, relocation of or compaction of soils sediments or minerals, requires the modification of the topography, thus displacing and/or destroying any cultural materials that may have been present (Wood 1982).

In terms of everyday land uses, vehicular movements on sites have been well documented and based on several experiments (DeBloois, Green and Wylie 1974, Gallagher 1978), have shown that vehicle movements over an archaeological site are extremely destructive to the site through compaction and movement, thus altering the spatial relationship and location of the artefacts. Based on general observations it is expected that the creation of dirt tracks for vehicle access would also result in the loss of vegetation and therefore will enhance erosion and the associated relocation of cultural materials. As fence construction requires the removal of soils for the post holes, this would also have resulted in the disturbance and possible destruction of any cultural materials. All of which result in loss of vegetation and erosion to some extent.

3.10 NATURAL DISTURBANCES

The disturbance of cultural materials can also be a result of natural processes. The patterns of deposition and erosion within a locality can influence the formation and/or destruction of archaeological sites. Within an environment where the rate of sediment accumulation is generally very high, artefacts deposited in such an environment will be buried shortly after being abandoned. Frequent and lengthy depositional events will also increase the likelihood of the presence of well-stratified cultural deposits (Waters 2000:538,540).

In a stable landscape with few episodes of deposition and minimal to moderate erosion, soils will form and cultural materials will remain on the surface until they are buried. Repeated and extended periods of stability will result in the compression of the archaeological record with multiple occupational episodes being located on one surface prior to burial (Waters 2000:538-539). Within duplex soils, artefacts typically stay within the A horizon on the interface between the A and B horizons.

If erosion occurs after cultural material is deposited, it will disturb or destroy sections, or all of, archaeological sites even if they were initially in a good state of preservation. The more frequent and severe the episodes of erosional events the more likely it is that the archaeological record in that area will be disturbed or destroyed (Waters 2000:539; Waters and Kuehn 1996:484). Regional erosional events may entirely remove older sediments, soils and cultural deposits so that archaeological material or deposits of a certain time interval no longer exist within a region (Waters and Kuehn 1996:484-485).

The landforms of the Holocene dunes within the project area indicate that erosion would have occurred on the dunes. The A horizon is relatively deep (about 1m) with sites located throughout the entire A horizon (specifically within 50 metres of the interbarrier depression) and although site movement occurs through the sands, the sites tend to move as a unit, thereby maintaining some site integrity with clear and distinct layers of shell middens and occupation levels.

The role of bioturbation is another significant factor in the formation of the archaeological record. Post-depositional processes can disturb and destroy artefacts and sites as well as preserve cultural materials. Redistribution and mixing of cultural deposits occur as a result of burrowing and mounding by earthworms, ants and other species of burrowing animals. Artefacts can move downwards through root holes as well as through sorting and settling due to gravity. Translocation can also occur as a result of tree falls (Balek 2002:41-42; Peacock and Fant 2002:92). Depth of artefact burial and movement as a result of bioturbation corresponds to the limit of major biologic activity (Balek 2002:43).

Burrowing and mounding by various animals and insects can result in the burial and translocation of artefacts. Size-sorting also tends to occur thus destroying stratigraphic integrity. Artefacts with a diameter smaller than that of burrows within an area may be moved upwards and be deposited in mounds by the fauna. Conversely, larger artefacts gradually move downward due to gravity and to animals burrowing beneath the larger artefacts and eventually collapsing into the burrow. They may then form concentrations which mimic cultural layers and are therefore open to misinterpretation (Balek 2002:46). Artefact burial rate through the effects of burrowing and mounding animals varies but can be as great as 2.7 metres in 5000 years (Balek 2002:45).

Experiments to assess the degree that bioturbation can affect material have been undertaken. In abandoned cultivated fields in South Carolina, Michie (summarised in Balek 2002:42-43) found that over a 100-year period 35% of shell fragments that had been previously used to fertilise the fields were found between 15 and 60 centimetres below the surface, inferred to be as a result of bioturbation and gravity.

Earthworms have been known to completely destroy stratification within 450 years (Balek 2002:48). Earthworm activity can significantly affect cultural materials though the degree and nature of disturbance will relate to the species of earthworm/s represented (Armour-Chelu and Andrews 1994; Canti 2003; Fowler et al. 2004; Stein 1983). Different species of earthworm's act in varying ways; some species live in deep soils and move vertically to and from the surface, whilst others live within the top ten centimetres of soil and tend to move horizontally through the soil matrix (Fowler et al. 2004:453). Earthworms, under favourable conditions, can excavate to depths of six metres (Stein 1983:278). Whilst, the size and behaviour of earthworms varies between species, they are similar in some ways; earthworms burrow through the soil by pushing soil aside or consuming it as well as organic materials, which they then regurgitate or excrete either behind them or on the surface. As earthworms move through the soil, they churn the soil within an area over time which results in blurring of soil horizons (Fowler et al. 2004:457, 461; Stein 2003:139).

The ways in which earthworms can affect cultural deposits includes: creating false artefact concentrations and stratigraphy (for example biomantles) by moving artefacts downwards through the soil; indirectly displacing larger artefacts as they burrow through the soil; burying artefacts through the deposition of fecal material on the surface; and blurring natural and cultural boundaries. They can also destroy remains of seeds and organic materials as they eat them (Fowler et al. 2004:462; Stein 1983:280-281). In Australia, most earthworm species cannot tolerate pH values lower than 4.5 and prefer neutral conditions with a pH of around 7 (Stein 1983:280).

Artefacts may also be moved as a result of an oscillating water table causing alternate drying and wetting of sediments, and by percolating rainwater (Villa 1982:279).

3.11 DISCUSSION

The regional environment provided resources, including raw materials, fauna, flora and water, that would have allowed for sustainable occupation of the area in close proximity to the interbarrier depression. Within the project area, the landforms of the Holocene dunal systems overlooking the

interbarrier depression have proven to be favoured for past Aboriginal land use with an abundance of sites and a variety of site types throughout these landforms, both on the surface and subsurface. This is also true in locations close to the beach areas, whilst the areas in between these two resource rich environments were utilised for travel and opportunistic hunting and gathering activities.

In relation to modern alterations to the landscape, in locations where agricultural activities have occurred, moderate impact to cultural materials would have occurred whilst in locations where construction works for housing, dams and sand mining have occurred, significantly high impacts to the archaeological record can be expected. On the other hand, in locations where reduced past land uses have occurred, minimal to no impacts to the archaeological record may be expected. Because of the natural and cultural processes discussed above, site integrity cannot be assumed for the project area. However, the existence of in situ cultural materials cannot be ruled out.

DRAFT

4 CULTURAL CONTEXT

This Section examines and discusses the interdependent relationships of First Australians and their ancestral lands, their connection to Country and the custodian's responsibility of ensuring Country is cared for and sustained by the environment. The inter-relationship between traditional oral histories, traditional knowledge, ethnographic research and archaeological investigations will become evident. Local knowledge has been used to great benefit by archaeologists in explaining archaeological patterning, constructing cultural histories and identifying broad cultural trends and patterns. However, what has been poorly articulated is the interface of such understandings with the local or traditional knowledge of Aboriginal people.

4.1 TRADITIONAL KNOWLEDGE

Indigenous traditional knowledge has been described as the collective body of knowledge, experience, epistemology, ontology, traditions and values held by societies that explain, record and perpetuate their relationship with the world and all it contains, intersecting the past, present and future (Aikenhead and Ogawa 2007; Bannister and Solomon 2009; Bruchac 2014).

Traditional knowledge is conveyed both formally and informally among kin groups and communities through social gatherings, oral traditions, ritual ceremonies and other activities. Knowledge includes oral narratives that recount human histories, cosmological observations and modes of reckoning time, symbolic and decorative modes of communication, ceremonial activities, trade routes, meeting places, men and women's places, story lines, seasonal plants and animals (for clothing, baskets, canoes, shields, food), water and medicinal resources and their locations throughout the landscape and raw material sources for the manufacturing of stone implements amongst many other activities. This system, or body of knowledge is based on individual and collectively learned experiences and conveyed and preserved through oral tradition and other forms of record keeping (such as art). What is not typically discussed, and is indeed difficult to describe, is the interdependent relationship of Aboriginal people and their ancestral lands. This connection to Country and the custodian's responsibility of ensuring Country is cared for and sustained by the environment is respected and the culture and the spirit of the land supported in the past present and future is part of being.

In contrast, Western knowledge is text based with tangible evidence based on categorisations. However, both forms of knowledge are constantly verified through repetition and verification, inference and prediction, observations and recognition of patterns. Both forms of knowledge can complement each other and both provide valuable information about past Aboriginal people. Whilst traditional knowledge provides an important means of compiling and protecting local knowledge and community interests, in order to meet western legislative reporting requirements, this information is summarised into inventory-based research which reduces such knowledge to symbols on a map, which is problematic as local knowledge is not so arbitrarily or randomly/subjectively bound (Cruikshank 1998).

Traditional knowledge provides an opportunity to evaluate both ethnographic sources and archaeologically derived evidence, and vice versa, while also generating new questions that can inform our understanding of past Aboriginal lifeways as well as contemporary heritage concerns. The following section is provided with permission of the RAPs and based on consultation, discussions of their knowledge, culture and the material trace it leaves.

4.2 WORIMI COUNTRY

For the Aboriginal people, The Dreaming is an incredibly integral part of their lives that has heavily influenced and dictated on both the physical and spiritual aspects of their lives. Whilst similar to other religions, mythology and cultures around the world, The Dreaming has been maintained for thousands of years, being passed down from generation to generation to this day, however for the Aboriginal people of Australia it is not a religion but a way of living.

A complex network of knowledge, The Dreaming dictated the way in which society was structured and how one was to behave in social situations. It also informed the Aboriginal people as to what ceremonies and rituals were needed to be performed in order to maintain the life of the land.

For Aboriginal people, spirituality refers to a way of being, and ways of knowing. It represents a sense of belonging in ties with the land, the ocean, the people and our culture (our lifestyle) both in the past, present and the future. It is an essential way of how we see and think about the world. Everyone and everything have a purpose; a shared relationship across the landscape, an understanding about a shared system of relationships, living and culture (Andrew Smith WLALC pers. comm).

Although different tribes around Australia had their own tales and stories which depict 'The Dreaming', there were certain aspects and principles of this system of beliefs which were prominent despite different tribes and locations. The Dreaming describes a time when the earth, Aboriginal people, the animals, and landscapes were created from ancestral spirits who came to earth and created these by movement throughout the land.

It is said that where these ancestral beings walked, the rivers, lakes and mountains were created. Even to this day, Aboriginal people have knowledge of where these Ancestral beings have walked and where they rested. These are known as Dreaming Tracks (song lines) and join many communities and continues to pass on knowledge to the younger generations.

One of the spiritual ancestors which is shared between many Aboriginal communities across Australia is known as The Rainbow Serpent, a large snake – like creature. With art over six thousand years old depicting tales of The Rainbow Serpent, it is a powerful symbol of both the creative and destructive power of nature, telling the story that it had created all life. However, if not properly respected, The Rainbow Serpent can also be an incredibly destructive force. The Rainbow Serpent's dreaming track is always associated with water such as billabongs, rivers, creeks, and lagoons. To this day it is said that after rain has fallen upon the earth, replenishing vegetation and rivers, The Rainbow Serpent's spirit can be seen as a rainbow across the skies.

Located on the eastern coast of New South Wales, The Worimi are the Original Custodians of the Port Stephens Area. Their connection to Mother (earth) spans further than westernised conceptual boundaries however and predominantly lies in the areas today, known as the Hunter River to Forster, and inland to the Barrington Tops.

Like all Aboriginal people; the Worimi too had traditions and beliefs which governed their way of life. An ancestral being known as Bayami, created life and gave it meaning. Bayami placed all shapes and sizes of plants upon the land and upon special places he created, he also placed men and women upon them. Bayami created the first laws that governed the way Aboriginal people lived and these remained unchanged for over thousands of years.

After creating, it was said that Bayami stayed in order to make sure that all living things were living together in harmony and when he was satisfied, he stepped back into the sky from whence he came, where he now watches over his people and creations.

In correlation with their beliefs, the Worimi people lived a hunter and gatherer lifestyle which had significant importance in regards to how they treated the land itself during the seasons. In order to allow for nature to regrow and rebirth what was taken, the Worimi people never stayed in one place for too long, moving to other areas within their own nation to survive in correlation to the seasons.

The knowledge that the Worimi people have in relation to the land is unsurpassed and is continued to be handed down from generation to generation. Their adaptive usage of the environment and what was available to them is incredibly advanced and this can be seen in the archaeological sites that are still being discovered to this day.

Due to the Worimi people living a semi nomadic lifestyle, the shelters that were built were basic but should not be disregarded as unsophisticated. Dependant on the season, the Worimi people would build different structures. In the hotter months of the year, their shelters were made from bush whilst in the colder months, their huts were made from bark. In 1826 Robert Dawson, a superintendent of the Australian Agricultural Company described their shelters during the winter as;

'A small hut supported by three forked sticks, about three feet long, brought together at the top in a triangular formation ; the two sides towards the wind are covered by long sheets of bark whilst the third was always open. In the winter, each family has its own fire.' (worimiconservationlands.com).

Similar to the other tribes located across Australia, the Worimi people had their own cultural set of practices and beliefs which were never broken. An incredibly progressive example of one of these practices is that the Worimi women had their own sacred sites known as Increase Sites. These were located close to fresh water and would be a place where the women could give birth safely to their child, usually they were accompanied by an older woman who acted as a midwife and no men were ever allowed at these Increase Sites. This was a place that provided shelter and safety for the mother and child where they would also stay until they were healthy enough to re-join the tribe (worimiconservationlands.com).

For the males, an initiation ceremony was carried out on what is known as The Bora Grounds – it was here that boys would take a step towards being seen as a man of the tribe. The front tooth of a young boy was removed by one of the elders by placing his bottom tooth against the upper tooth and, by giving a sudden jerk, snapping off the boy's tooth. During these ceremonies women were excluded in a similar manner to how men were not allowed at women's Increase Sites.

For the Worimi people, their burials were timed with the receding of the tide, believing that the spirit of the deceased would be carried out to sea. These graves were marked by a small She-Oak sapling that was always planted over the grave (worimiconservationlands.com). Numerous burials have been, and continue to be exposed throughout the dunal system through erosion, and at times, developments.

With the Worimi country being a coastal area, fishing was one of the most important activities which was integrated heavily within their lives. There were two methods of fishing for the Worimi people. The first being the technique of using a spear, these were made by the men of three distinct and different parts – the main shaft being that of the Gigantic Gynea Lily, the dried flower stem of the Grass Tree and a barbed head made from Iron – Bark. The men would often fish from canoes and on the shoreline.

Worimi women, they instead used line and netting to catch fish. These were made from the inner bark of the young Kurrajong trees, the bark would be carefully stripped and soaked in water until the outer parts could be scraped away with a shell. This left a white fibre that was tough enough to be used for fishing, it was then rolled around the thigh of the woman to the required thickness which was needed. The women typically fished from canoes and unlike the men, they would traditionally

have the first joint of their little finger removed to symbolize that they were fishermen for their people.

Located close to their shelters, large communal ovens were often constructed. These were lined with stones to retain the heat from fire and embers whilst cooking. There were times where some foods would be wrapped up in green vegetation, covered in more hot stones to bake the contents slowly – food cooked with this method retained more moisture and sweetness.

An important archaeological site type which is often found to this day and close to these communal ovens, are shell middens. A shell midden is an area where Aboriginal people would often feast, these sites would gain substantial amounts of bones and shell as they were used over generations (sometimes growing to be meters in height) and whilst non – Aboriginal people tend to refer to these middens as “waste dumps” it ignores the sophisticated cooking and crafting techniques of the Aboriginal people.

Middens have the ability to inform present and future generations about the activities of the Worimi people. The types of shell and bones within one can inform us of what food sources were available and in what times of the year when these sites were used. Generally, these middens are located around sandy beaches and dunes overlooking the interbarrier depression at a pleasant space that was easy to access. Some of these middens have also been known to contain artefacts and tools which have been made from stone, whilst others have contained fishhooks made from bone or shell with some estimated to being over nine hundred years old.

During the warmer months of the year, people had a varied and abundant resource of marine food which was heavily preferred amongst the people; fish, oysters, and pipi (commonly known as clams) were consumed during these months and tended to make people more relaxed (worimiconservationlands.com). It was during the winter months that their diet changed significantly from a diet rich in marine resources to living off the land itself. The Worimi people would travel further inland to hunt for kangaroo and wallaby, which were the preferred meats to eat. Possum was considered a delicacy however and only eaten on special occasions.

5 ETHNOHISTORIC ACCOUNTS

Although ethnographic accounts do not consider or discuss Aboriginal relationships to the land and its significance, they do provide insights into some past Aboriginal activities, some of which leave evidence in the landscape (tangible sites) and can be confirmed through archaeological investigations. Intangible sites, such as mythological, storytelling etc., cannot be confirmed by archaeological investigations and are rarely recorded by early explorers and such traditional knowledge is vital in understanding the cultural landscape.

Anthropologists and ethnographers have attempted to piece together a picture of past Aboriginal societies throughout the Hunter Valley. Although providing a glimpse into the past, one must be aware that information obtained on cultural and social practices were commonly biased and generally obtained from informants including white settlers, bureaucrats, officials and explorers. Problems encountered with such sources are well documented (e.g., Barwick 1984; L'Oste-Brown et al 1998). There is little information about who collected information or their skills. There were language barriers and interpretation issues, and the degree of interest and attitudes towards Aboriginal people varied in light of the violent settlement history. Access to view certain ceremonies was limited. Cultural practices (such as initiation ceremonies and burial practices) were commonly only viewed once by an informant who would then interpret what he saw based on his own understanding and then generalise about those practices.

5.1 WORIMI ETHNO-HISTORIC ACCOUNTS

Early ethnographic records of the Port Stephens area are limited. Port Stephens consists of the submerged estuary of the Myall and Karuah Rivers. The area was described by surveyor Charles Grimes in 1795 as inhabited by the Worimi Tribe, whom he described as “taller” and “stouter” than Aboriginal people of the Sydney area, utilising a completely different language (Dowd, undated; Port Stephens Council, 2009). Prior to contact with settlers, the Worimi people extended from Port Stephens to Forster/Tuncurry in the north and west out to Gloucester. The Worimi comprised a number of tribes who lived on the water's edge and utilised both land and sea resources in their daily lifestyles (Leon, 1998; Port Stephens, 2011). These tribes included the Garuagal, Maiangal, Gamipingal, Garrawerrigal, Buraigal, Warringal, Birroongal, Birrimbai, Yeerungal and Wallamba (Enright 1900; Sokoloff 1975, 1976, 1977; Leon 1998).

Social organisation for the Worimi included aspects such as leadership, government, punishments, duels, fights, marriage, totemism and family structure, within a social system that had both spiritual and social significance. Leadership was based around leading men, being older and fully initiated, who acted as general advisers. Disputes between groups for such things as territorial infringement were settled through battles, enacted to satisfy honour rather than being matters of mortal combat. Marriages were arranged by both kindred and parents; a number of patrilineal totemic clans had a bearing on both kinship and marriage, ensuring that strict laws were maintained, preserving tribal strength and avoiding in-breeding (Sokoloff 1976). In 1830 Robert Dawson described the Worimi Tribe as utilising spears and shields, wearing belts of opossum fur, and using combs formed from the leg bones of kangaroos (Dawson 1830: 115). Bark was described as an essential material used in the production of numerous items. Notches were cut into trees “large enough only [to] place the great toe in” to enable easy climbing to strip bark “in lengths from three to six feet” (Dawson 1830: 19). This bark was used for covering huts; bark was also utilised for making string “as good as you can get in England, by twisting and rolling it in a curious manner with the palm of the hand on the thigh” to make nets, fishing lines and bags (Dawson 1830: 67). Sally Wattle and Kurrajong tree barks were used in making string; fishing lines were waterproofed with the sap of the Bloodwood tree (Port Stephens Council 2009).

The importance of the ocean as a source of food resource for the Worimi people in the Port Stephens area was noted in multiple sources, as were land resources for tools. Fish hooks, for example, were made from oyster and pearl shells and yellow gum from the Grass Tree was used in manufacture to affix the disparate elements together (Dawson 1830: 67; Port Stephens Council 2009). Spears were also used for fishing, made from the flowering stem of the Grass Tree or Gynea Lily, with prongs of ironbark used on the tips. Other hunting tools and weapons were also manufactured from plants, including Boomerangs, which were made from wild Myrtle (Sokoloff 1975; Port Stephens Council 2009). As well as utilising plant resources in tool manufacture, many were also used as food resources. The Gynea Lily's young flowering spikes were fire roasted and eaten after being soaked in water. Wild Cape Gooseberries grew on the nearby Cabbage Tree Island and were a highly prized food resource. Other items such as Fern root and daisy yam were a necessary supplement to diet, especially when there was a scarcity of the primary food resource of fish (Sokoloff 1977; Port Stephens Council 2009).

As viewing of rituals and ceremonies by Europeans was restricted, little is known of these past practices. However, it is known that sacred and ceremonial activities were linked with the Aboriginal relationships with the land. Ground burials were the most common form of final internment inland. A shallow grave was dug and lined with grass. The deceased was wrapped in paperbark, tied up, placed in the grave, covered with grass, covered with another layer of bark and a final layer of grass and then covered with earth building up a mound (Bluff 1989). In the Port Stephens area burial practices appear to have varied and may in part have been determined by the environment (as well as social structure). Informants for Howitt (1996:465) state that in the area the body of the deceased was neatly folded in bark and placed in the grave at flood-tide. It was never placed at ebb as it was believed the retiring water would bear the spirit of the deceased to some distant country. An old couple who only had one daughter who died, built their hut over her grave close to the shore of the harbour and lived there many months. They then moved their hut a few yards away and remained there until the grass had completely covered the grave. They then left and never visited the grave again.

6 ARCHAEOLOGICAL CONTEXT

A review of the archaeological literature of the region, and more specifically the local area and the results of an AHIMS search provide essential contextual information for the current assessment. Thus, it is possible to obtain a broader picture of the wider cultural landscape highlighting the range of site types throughout the region, frequency and distribution patterns and the presence of any sites within the project area. It is then possible to use the archaeological context in combination with the review of environmental conditions to establish an archaeological predictive model for the project area.

6.1 REGIONAL ARCHAEOLOGICAL CONTEXT

The definition of site curtilages in NSW are guided by the requirements for site registration in the AHIMS database, leading to geographically discrete sites as individual entities, existing in isolation. Such an approach is understandable, as it grows from the need to define sites as per legislatively guided parameters. This is further reinforced by the geographically focussed work of consultant archaeologists, limiting their analysis to a specific geographically constrained area based on individual project specifications. While this is the common practice for recording individual sites, it is important to contextualise them within a broader archaeological and cultural landscape that links them together. In this way assemblages may be understood as a continuous scatter of cultural material across the landscape and the nature of activities and occupation can be identified through the analysis of artefact distributions across a landscape. In the case of this region there is a variety of evidence indicative of long-term Aboriginal habitation, particularly in relation to the Newcastle Bight sand system, which incorporates both inner (Pleistocene: c. 1.8 million to 10 000 years ago) and outer (Holocene: 10 000 years ago) coastal barriers as well as the interbarrier system.

Exploitation of swamp and wetland resources (the interbarrier depression) figured prominently in the lifestyle of the Worimi people as evidenced by the abundance of sites along both the Pleistocene and Holocene dunes overlooking this area as evidenced through a plethora of past archaeological assessments throughout the area. Swamps such as the interbarrier depression were favoured with dense complex occupation sites along its fringes.

Of particular relevance to the regional archaeological patterning is the Dean-Jones' (1990) study. Dean-Jones undertook a detailed assessment of the nature and distribution of Aboriginal archaeological sites within both the Inner and Outer Barrier of Stockton Bight. The results of this assessment re-defined previous findings and predictive modelling with her findings on the Holocene dune sequence. The sites along the interbarrier margin and crests of the 4,500 BP Holocene dunes were assessed as holding high scientific significance and sites tended to retain stratigraphic integrity to depths of 30-40 cm. Some of these sites also contain charcoal which can be used for dating purposes. Dean-Jones suggested that the distribution and density of sites recorded along the face of the old Holocene dunes at the interbarrier depression suggests that this geomorphic environment has a high archaeological sensitivity and that many more sites are likely to be situated in this area. Dean-Jones identified geomorphic units within the Outer Barrier as having high archaeological sensitivity as follows:

- the seaward margin of the active transgressive dunes and the landward margin of the deflation basin, with the assumption being that the majority of sites in this context were associated with former;
- stabilised soil surfaces but have been exposed and/or deflated by dune transgression; and
- stabilised dunes bordering the Inter-Barrier depression; and estuarine shorelines.

The inner Pleistocene dunes overlooking the interbarrier depression have also proven to be of high archaeological significance with occupation extending along the interbarrier margins and crests with one of the most significant sites identified, Moffats Swamp. Baker (1993) completed archaeological excavations across a series of large vegetated sand dune crests directly across Richardson Road from Moffats Swamp, Medowie between Newcastle and Port Stephens, NSW. Landforms across the investigation area consisted predominantly of swampland with associated dunes. Moffats Swamp was the main water source in the area, one of a series of swamps which occurred at the inner margin of the Newcastle Bight sandy country. It was noted that artefacts and shell material had been uncovered during sand extraction activity in the surrounding region and other sites in the general area consisted predominantly of artefact scatters and middens. It was predicted that sites were most likely to occur on dune crests in association with water. This prediction was proved accurate by the results of the archaeological testing. Two sites were identified during subsurface testing across the area, both on dune crests and subsequent salvage provided evidence of past Aboriginal occupation in the inner Pleistocene barrier dated to 17,376 BP at Moffat's Swamp (Baker 1994).

Interestingly, ERM's (2003) assessment for the proposed Electricity Supply upgrade between Tomago and Tomaree covered the three major units of the Newcastle Bight dune system, these being the inner Pleistocene barrier, the interbarrier depression and the outer barrier Holocene dune system with significant results. Ten new sites were identified and five previously recorded sites were found and seven PADs identified (two located on the Inner Pleistocene barrier system and five on the Holocene Barrier System). Consisting of shell middens with artefacts, ERM identified sites along the dunes overlooking the interbarrier depression, a reduction in sites in the dunes seaward and an increase in sites in closer proximity to the beach. ERM and MCH (2015) also noted that the distribution of shell species across the dune field suggests that shellfish were not transported across the barrier system. Sites with pipi (a marine species) are confined to the outer margin of the barrier and sites with *Pyrazus* and oyster (estuarine species) distributed across the inner barrier.

More recently, Mitchell and Lillis (in prep) undertook an archaeological desktop sensitivity mapping and geomorphological assessment within the probable maximum flood (PMF) boundaries at various locations throughout the Hunter Valley region including the Hunter Estuary and inter-barrier environment along Tilligerry Creek. The objective of the assessment was to consider the known and potential Aboriginal cultural heritage sites within these locations in relation to past land uses and the potential effects of climate change. The findings in relation to known and potential Aboriginal sites for each of the landscapes within the investigation is summarised here.

The estuarine plan landscape is identified as an extensive area shared between Newcastle City and Port Stephens Shire. It included all of the Hunter River estuary, the lower reaches of the Williams River, the Port of Newcastle and almost all of the inner coastal barrier. Subaqueous landforms were assessed as unlikely to contain Aboriginal sites and bars, beach and shoreline ridge areas were assessed as having the potential to contain shell middens and burials. It was also argued that the estuarine swamps had swamp soils that could preserve organic artefacts and possible traces of eel channels/drainage and areas of cultural significance were noted as possible. Estuarine plain areas were considered to only have limited archaeological potential.

Labelled as the Newcastle and estuary, Mitchell et al (in prep) identified that the wetlands surrounding Fullerton Cove had been modified by levee and drain construction with concentrations of natural shell exposed in drains. Tilligerry Creek was noted as having large deposits of modern oyster shell, and it was noted this should not be confused with Aboriginal shell middens. The coastal barrier landscape unit consisted of two stacked barrier systems present at the mouth of the Hunter River. Beach areas were assessed as areas where reworked artefacts had the potential to occur and the foredunes were considered to be locations where reworked artefacts and burials could occur. Outer backbarrier flats were considered to contain isolated artefacts only. Inner-barrier dunes were

assessed as having the potential to contain open sites, middens, burials and culturally modified trees and the inner-barrier beach ridges and inner backbarrier flats were assessed as only likely to contain isolated artefacts.

The inner and outer barrier landform consists of the inner barrier (inland) (32 kilometres long) and attached to bedrock at Tanilba/Mallabula and Hexham. Ground penetrating radar surveys suggested that the barrier was not homogenous, with intervals of shoreline progradation interspersed with channel deposits. It was also noted that some shoreline disjuncts could preserve Aboriginal sites in subsurface deposits. The outer barrier was similar in stratigraphy to the inner barrier in containing a topographically lower, transgressive facies with marine shells, and an overlying regressive facies of beach ridges and dunes. The outer barrier began to accumulate marine sand in the early Holocene and extended from Stockton for 34 kilometres to Morna Point at Anna Bay. Approximately 200 Aboriginal sites were exposed and eroded in the mobile dunes, with the potential for further unknown sites to be present in less disturbed sections or covered by drifting sand.

Land between the two barriers is occupied by Tilligerry Creek and an excavated drain that almost connected Fullerton Cove to Port Stephens. On the coastal side of the creek a back barrier flat was formed by storm wave wash over deposition at the time when the outer barrier was first formed. There are Aboriginal middens along the creek which contain both estuarine and open ocean species with reported dates of 2,000 to 3,000 Before Present (BP). Both barriers had been occupied and used by Aboriginal people. Aboriginal people would not have used the inner barrier as it was forming as those pre-dates the presence of Aboriginal people, but it was stated that they definitely occupied it in later periods. The beach ridges in the inner-barrier provided well defined, dry, routes through the sand dune country and it was assessed as likely that they may contain important, as yet unidentified, sites.

Estuarine swamps (inter-barrier depression) have moderate archaeological potential along the interface with the dunes, or margins of the swamps (dunes overlooking the swamp). This is due to the fact that the swamp (inter-barrier depression) was a very important food and fibre resource and evidence of the use of this rich resource is found along its margins (middens, artefact scatters, scar trees, burials, hearths, knapping floors etc.), (Mitchell, Lillis & Virtus Heritage, in prep, 82-85). Whilst not actually camping in the swamp itself, swamp lands are known for soils that may allow for the preservation of organic materials such as wooden tools, fibre nets etc. However, predicting where such materials may be located within the swamp area is problematic, especially as this environment has undergone significant natural and anthropogenic changes and as such implements would not have been deliberately buried in the swamp, but rather accidentally left behind or discarded with no pattern of discard across the area.

The Inner barrier dune system was identified as being of low to moderate archaeological potential, (Mitchell, Lillis & Virtus Heritage, in prep, 82-85). However, as this landform borders and is the interface with the swamp and numerous sites have been identified in this landform, this area should be considered to be of high archaeological potential, at least along its margins with the swamp and for at least 100 metres away from the swamp. A small area of the Inner Barrier Beach Ridges is located in the north between the swamp and Inner Barrier dune as well as the far north and has been identified as being of low archaeological potential, (Mitchell, Lillis & Virtus Heritage, in prep, 82-85). However, at some locations this landform borders and is the interface with the swamp and as such should be considered to be of high archaeological potential, at least along its margins with the swamp and for at least 100 metres away from the swamp.

In addition to the above regional based studies, a series of archaeological investigations within the Stockton Bight area (e.g. Comber 1991; Smith 1987; Brayshaw 1989, 1990a, b; Dean-Jones 1990; Evans 1993; Effenberger 1996; ERM 1998, 2005a, b, 2010; RPS 2010a, b; Resource Planning 1991a,b, 1992; Sullivan 1978; Umwelt 2000, 2003, 2011a, b; MCH 2003, 2004 a-c, 2005, 2009, 2010a, b, 2011, 2012 a -

c, 2015 a – c, 2017, 2018, 2019, 2022) have addressed the patterning of archaeological sites within the region, which is acknowledged to be of high archaeological sensitivity and significance. The area of Stockton Bight especially the Fern Bay and Stockton localities, would have provided access to both marine and estuarine subsistence resources. This area was an extremely rich resource zone, providing access to marine, estuarine and wetland resources in the immediate vicinity. In addition, the botanical resources of the Bight include numerous species known to have been valued by Aboriginal groups as food sources. In such a locality, the archaeological record of Aboriginal occupation is complex and extensive. A number of archaeological sites are known to occur within the stable dune system of the Bight, the majority of which appear to be small, surface scatters of midden materials including shell, bone and stone artefacts. Site frequency and density appears to increase in associated with wetlands and their subsistence resource, with several large, complex archaeological sites present adjacent to wetlands of the interbarrier depression, between Fullerton Cove and Tilligerry Creek.

6.1.1 SUMMARY OF REGIONAL ARCHAEOLOGICAL PATTERNING

Within the region, a broad range of site types are represented including isolated artefacts, open campsites, shell middens and burials. A wide range of landforms have been sampled and it is evident that site distribution is closely linked to topography and hydrology, with dunes overlooking the interbarrier depression and along the beach areas were favoured for camping whilst the areas in between the beach and interbarrier depression were utilised or travel between these two resource rich environments. Previous archaeological investigations conducted within the region have produced a significant volume of information in relation to the distribution and nature of archaeological material within this region. These previous assessments have identified a number of trends that can be identified as follows:

- The majority of sites within the region consist of shell middens (containing beach and/or estuarine species) and stone artefact scatters, with sites varying from single artefacts to dense concentrations of material in both a surface and sub-surface context.
- Other site types occur including a significant number of burials (usually exposed through erosion), scar trees and ceremonial sites.
- Within the stabilised dune fields, it is suggested that greater concentrations of archaeological material (in terms of site numbers and artefact densities) are located on low ridgelines, spurs and low dunes associated with wetland resources overlooking the interbarrier depression.
- Areas at the interface of the swamps (inter-barrier depression) and dunes overlooking the swamp have high archaeological potential due to the fact that the swamp (inter-barrier depression) was a very important food and fibre resource.
- Archaeological material within the active transgressive dune field and current deflation basin primarily consists of exposed and/or deflated deposits that were once associated with former stabilised surfaces and periods of stabilisation. Although some archaeological material may have been deposited during periods of instability (i.e., not in association with a stable soil surface), this material is likely to have been limited in both extent and distribution.
- Access area between the ocean and swamp area were not suitable for more than transitory activities such as hunting and gathering, travel between resource rich environments with possible overnight camping due to the distance from the aquatic and estuarine resources.
- Due to vegetation coverage and the nature of sand deposits, the detection of sites is directly related to levels of exposure and visibility. Sub-surface deposits may be at a considerable

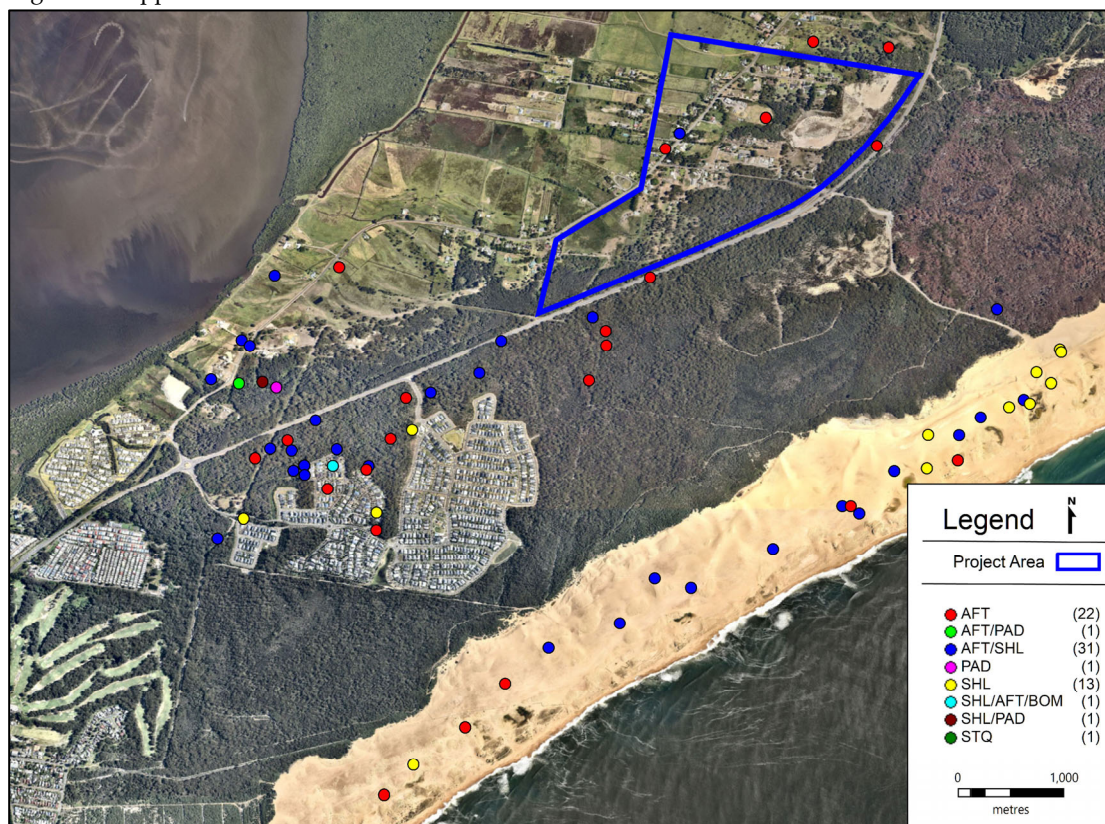
depth below the current dune surface and therefore are unlikely to be detectable unless significant disturbance has occurred.

6.2 ABORIGINAL HERITAGE INFORMATION MANAGEMENT SYSTEM

MCH note that there are many limitations with an AHIMS search. Firstly, site coordinates are not always correct due to errors and changing of computer systems over the years that failed to correctly translate old coordinate systems to new systems. Secondly, AHIMS will only provide up to 110 sites per search, thus limiting the search area surrounding the project area and enabling a more comprehensive analysis and finally, few sites have been updated on the AHIMS register to notify if they have been subject to a s87 or s90 and as such what sites remain in the local area and what sites have been destroyed, to assist in determining the cumulative impacts, is unknown. Additionally, terminology for site names including (amongst many) an 'artefact' site encompasses stone, bone, shell, glass, ceramic and/or metal and combines both open camps and isolated finds into the one site name. Unfortunately, this greatly hinders in the predictive modelling as different sites types grouped under one name provided inaccurate data.

A search of the AHIMS register has shown that 71 known Aboriginal sites are currently recorded within one kilometre of the project area and include 22 artefact sites, 13 shell middens, 31 shell and artefact sites, one PAD, one stone quarry, one artefact and PAD sites, one shell and PAD site and one shell, artefact and non-human bone and organic material site. The AHIMS results are provided in Appendix A and the location of sites is shown in Figure 6.1.

Figure 6.1 Approximate location of AHIMS sites

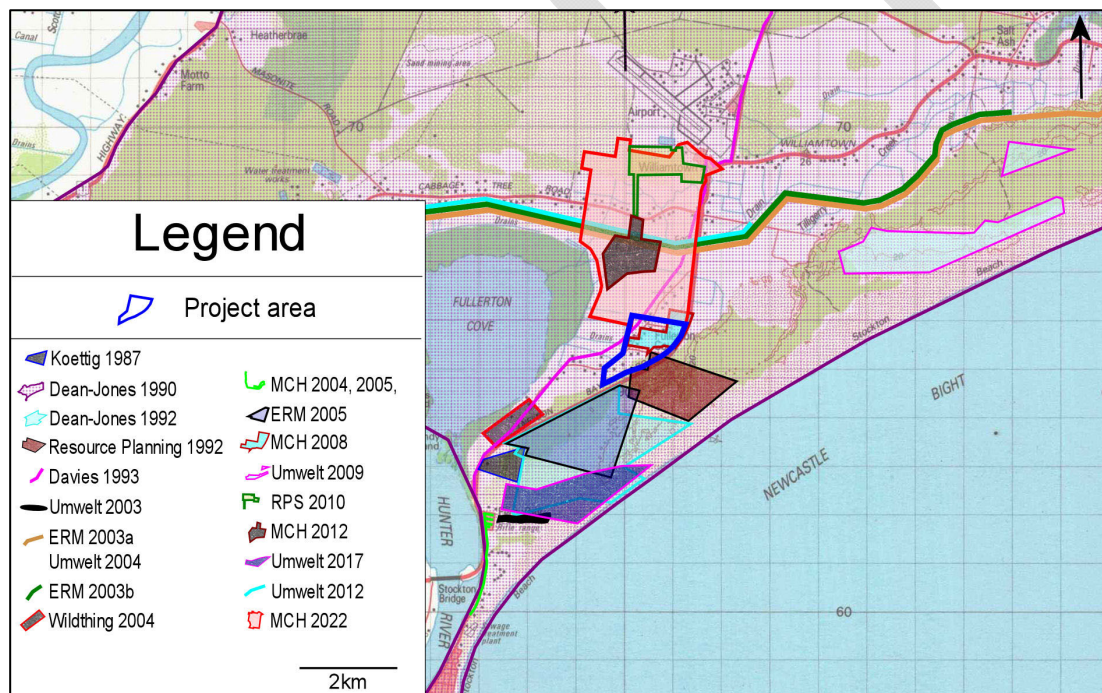


6.3 LOCAL ARCHAEOLOGICAL CONTEXT

Limitations in the use of examining previous local assessment include the number of studies in the local area. Fewer studies suggest that sites have not been recorded, ground surface visibility also hinders site identification and the geomorphology of the majority of NSW soils and high levels of erosion have proven to disturb sites and site contents, and the extent of those disturbances is unknown (i.e., we do not know if a site identified at the base of an eroded slope derived from the upper crest, was washed along the bottom etc: thus, altering our predictive modelling in an unknown way).

All archaeological surveys throughout the local area have been undertaken in relation to environmental assessments for developments. The most relevant investigations indicate differing results and observations based on surface visibility and exposure, alterations to the landscape (including mining, industrial and residential development), proximity to water sources and geomorphology. The reports available from AHIMS are discussed below and their location illustrated in Figure 6.2.

Figure 6.2 Approximate location of previous local assessments



- Koettig, M. 1987. Preliminary Assessment of Aboriginal Archaeological sites in the proposed sand extraction location at Nelson Bay Road, Newcastle Bight: DP 530095. New South Wales. Report to W. R. Corkery and Co. Pty Ltd.

Koettig (1987) undertook an assessment for a proposed sand quarrying located in the vicinity of Nelson Bay Road near Stockton. The proposed sand quarrying was to involve quarrying a section of sand crossing Outer Barrier dunes of Holocene age, in an area that would have been a resource rich zone in the past. The topography of the study area was very gently undulating with the height between dune crest and wale averaging less than 20 metres. The dune ridges ran from southwest to northeast, were higher in the southern portion of the study area and were sometimes associated with swamps. There was little evidence of past disturbances with the area mostly untouched, with the

exception of a transmission line that cut across the western portion of the study area and three tracks that ran approximately east to west across the dunes. Vegetation consisted of a range of communities and species, including blackbutt, smooth-barked apple, banksia, swamp mahogany, melaleuca, swamp oak, broad leaved paperbark and the orchid *Pterostylis*. Many of the species could have been exploited by Aboriginal people in the past for a variety of uses. A search of the NPWS sites register identified 47 known sites, 45 of these being middens. No predictive model was compiled for this report. The survey focused on exposures and investigation with a Luebers probe along a ridgeline and in association with identifiable shell middens, to test for subsurface indication of shell and depth. Eleven (11) new sites were identified and are summarised in the table below.

Table 6.1 Summary of sites (Koettig 1978)

Site	Site type	Landform	Distance to Water	Stream Order	Artefacts/Features	Disturbance	Subsurface potential
NBR1	midden/artefact scatter	dune top	not noted	Hunter River	shell midden, 40 artefacts	exposure, track	not noted
NBR2	midden/artefact scatter	dune top	not noted	Hunter River	shell midden, 3 artefacts	track	below surface 15 to 20 cm
NBR3	midden	dune top	not noted	Hunter River	shell midden	track	below surface 10 to 15 cm
NBR4	artefact scatter	dune top	not noted	Hunter River	6 artefacts	track	not noted
NBR5	artefact scatter	slope	not noted	Hunter River	2 artefacts	track	not noted
NBR6	midden	dune top	not noted	Hunter River	shell midden	track	below surface <10 cm
NBR7	midden/artefact scatter	dune top	not noted	Hunter River	shell midden, 3 artefacts	track	not noted
NBR8	midden	dune top	not noted	Hunter River	shell midden	track	below surface to 25 cm
NBR9	midden	dune top	not noted	Hunter River	shell midden	track	not noted
NBR10	midden	dune top	not noted	Hunter River	shell midden	track/exposure	not noted
Isolated Find	isolated find	not noted	not noted	Hunter River	1 stone artefact	not noted	not noted

Koettig concluded that the survey results demonstrated a continuous distribution of midden and stone artefacts across the dune crests in the northern portion of the study area. It was further pointed out that the absence of sites located in the southern portion did not mean there were no sites there, since the area was not deeply disturbed enough to reveal subsurface deposits. It was further noted that there was a possibility that burials may have taken place in the dunes, as previously two had been found in Newcastle Bight and one on Broughton Island associated with midden deposits. Due to the lack of exposure in some areas, lack of previous investigation and poor recording of past sites, it was determined to be impossible to establish the significance of the newly recorded sites. It was recommended that test excavations needed to be undertaken and resource extent determined in order to assess site representativeness, “and hence whether destruction of the sites is a valid alternative recommendation, or whether the site should be preserved”.

- Dean-Jones, P. 1990. Newcastle Bight Aboriginal Sites Study. Report to NPWS.

Dean-Jones’ extensive archaeological survey of Newcastle Bight in 1990 has contributed significantly to our understanding of the archaeology of the region. She recorded 119 Aboriginal sites during the survey with an additional 40-50 middens noted, but not recorded due to time constraints. The distribution of known sites prior to this study appeared to be clustered around the north eastern shoreline of Birubi Point, the mouth of Tilligerry Creek, near Salt Ash and the Hunter River estuary/Fern Bay area. This trend was thought to be a factor of archaeological studies being undertaken for specific development applications rather than a definitive picture of archaeological site distribution across the Newcastle Bight. Sites were commonly found in several geomorphic environments, including bedrock marine headlands, open estuarine shoreline, Pleistocene and Holocene dunes. Dean-Jones also found sites in these environments, however, distribution varied.

The majority of sites recorded by Dean-Jones were shell scatters (34.5%) followed by open artefact scatters (17.4%). Almost 74% of all sites comprised either estuarine or marine shell, although only 12% were classified as stratified deposits. Most sites were located in the seaward margins of active transgressive sand dunes/active blowouts (34 sites) or beach/fore dune or outer deflation basins (28 sites). The survey’s findings showed site distribution in some areas was much greater than previously thought with notable differences in the beach/deflation basin and transgressive dune system. Collectively, approximately 20% of all recorded sites were directly associated with Interbarrier depression wetlands. Most of these sites were on either Pleistocene transgressive dunes or Holocene transgressive dunes. Sites on the Holocene side of the Interbarrier depression contained large numbers of marine and freshwater shell species.

Dean-Jones (1992) also surveyed and conducted shovel testing across a large area at Fern Bay. The ground surface visibility was relatively good due to a recent bushfire that had removed much of the vegetation. The shovel test excavation was undertaken to determine the local geomorphology and its implications for the age and location of archaeological sites. Dean-Jones concluded that archaeological sites within the study area have a maximum age of 4500 BP. This is because aeolian re-working of the barrier surface (during the period of accretion) would have effectively destroyed all archaeological sites before 4500 BP.

Dean-Jones (1990) indicates that archaeological material is generally limited to the upper 50 centimetres of the dune soil profile. She also noted that there were several problems associated with the definitions of shell deposits during survey, noting that both anthropogenic and natural shell deposits were observed. She suggests that the maximum age for occupation evidence on the outer stable transgressive dune is 1200 BP, which represents the period of time that this dune has been stable. Prior to 1200 BP this dune was actively mobile which means that archaeological material would have been re-worked and deflated or dispersed. The results indicate that archaeological evidence is concentrated on elevated ground, but not necessarily on the main or higher ridge, most

sites were found within the inner (4000 BP) stable dune field. Archaeological evidence within the 1200 BP dune field is rare except along its seaward margin. Dean-Jones also notes that there appears to be a relationship between site distribution and the presence of freshwater within the dune field, with evidence of occupation most common where elevated ground is separated by the swamp forest wetlands. Sites in the study area include shell only, flaked stone only or both shell and flaked stone, however, it is not clear if the variations are due to surface visibility or to real differences in site types across the dunes. The distribution of shell species across the dune field suggests that shellfish were not transported across the barrier system. Sites with pipi (a marine species) are confined to the outer margin of the barrier and sites with *Pyrazus* and oyster (estuarine species) are distributed across the inner barrier. Shovel testing undertaken by Dean-Jones found that flaked stone occurred most commonly at a depth of 30 – 60 cm below the surface, and as deep as 90 cm at one site.

- Resource Planning Pty Ltd. 1992. Fern Bay Sand Resource Potential Constraints and Strategy for Development Archaeological Survey. Report prepared for Boral Resources (NSW) Pty Ltd.

Resource Planning (1992) completed a development strategy and constraints model for the proposed Fern Bay Sand Resource area. This study area was situated at Fern Bay on the southern portion of Newcastle Bight. The Bight stretched from the northern edge of the Hunter River in the south to the southern shore of Port Stephens in the north. The area was proposed for sand mining activity. The topography of the study area consisted of fore-dunes and a deflation basin with active transgressive dunes, in close proximity to the beach, formed from mobile sand. There was also an area of low, stabilised sand and swamp and an area of higher, stabilized transgressive dunes. Vegetation communities included dry sclerophyll low open forest dominated by smooth barked apple and blackbutt on the back dunes, a swamp sclerophyll forest of broad-leaved paperbark and swamp mahoganies with shrubs in the low-lying swampy areas of the south east and north west areas of the property, and tea tree shrub along the active transgressive dune area. Blady grass and bracken fern were also present. The nearest permanent water source was the Hunter River, situated to the south of the study area. Swamp areas were utilised as water sources as well as waterholes.

No NPWS search results were included in this report, but reference to past surveys in the area noted that middens (both with and without associated stone artefacts) were the most commonly identified site type in the general area. No predictive model was included in this report. The survey methodology was simple and involved covering a portion of each landform unit by walking. A range of topographic features such as ridge tops, slopes, spurs and gullies were examined. In addition, areas with little obvious disturbance and areas of greater ground surface visibility, such as vehicle tracks, were inspected. Sites were not recorded individually or in detail for this report. The available survey results are summarised below in Table 6.2.

Table 6.2 Summary of sites (Resource Planning 1992)

Site	Site type	Landform	Distance to water	Stream order	Artefacts /features	Disturbance	Subsurface potential
unnamed	midden	foredune, deflation basin and active transgressive dunes	not provided	swamp	pipi shell	four-wheel driving across deposit	yes
unnamed	midden	foredune, deflation basin and active transgressive dunes	not provided	swamp	pipi shell	four-wheel driving across deposit	yes
unnamed	midden	low lying area of stabilised sand	not provided	waterholes	pipi shell	wind & animals	yes

unnamed	midden	low lying area of stabilised sand	not provided	waterholes	pipi shell	wind & animals	yes
unnamed	artefact scatter	stabilised transgressive dunes	not provided	not provided	8	road	not provided

By using the information from previous archaeological surveys and the results from the survey, areas of archaeological sensitivity were identified. These PADs are summarised below in Table 6.3.

Table 6.3 Summary of PADs (Resource Planning 1992)

PAD	Landform	PAD area	Disturbance
PAD 1	deflation basin	not provided	not provided
PAD 2	low lying area between dunes	not provided	not provided
PAD 3	stabilised transgressive dunes	not provided	not provided

It was stated that salvage work may be required prior to sand extraction activity being able to progress. It was recommended that permits be sought from NPWS and should salvage works occur that they be carried out with full consultation, approval and cooperation with the Worimi Local Aboriginal Land Council (WLALC).

- Davies, S. J. 1993. An Archaeological Assessment of ten Telecom Optic Fibre Cable Routes located between Gosford and Wauchope, Central Coast, NSW. Report to Telecom Australia.

Davies (1993) completed an assessment for ten proposed routes for Inter Exchange Network Optic Fibre Cables located between Gosford and Wauchope. It was proposed by Telecom Australia to install these cables via plough and ditch methods. Routes 1 and 2 were in the Gosford area, Routes 3 to 6 were in the Williamtown area, Routes 7 and 8 were in the Forster area, Route 9 in Gloucester and Route 10 in Wauchope. The proposed routes followed, wherever possible, existing utilities, easements and roads. Route 1 was from Woy Woy (Ettalong Beach) to Wagstaff Point, following the course of an existing conduit adjacent to a dirt track. From there it was proposed that divers would jet the cable to the floor of the channel of Brisbane Water. The main topography crossed by this cable was beach and channel. The beach areas comprised Quaternary deposits of quartz sand with minor shell deposits at Ettalong Beach and lithic-quartz sandstone, shale, quartz and laminate at Wagstaff. Route 2 was from Erina to Mt Elliott and followed existing roads and service corridors. In one section it crossed an overgrown/disused road area and crossed at Erina Creek where a bridge had once been located. Vegetation in the area had been altered from its original composition and contained mainly dry sclerophyll forest with a grassy understorey. A ridge crest area was included as part of this route. Route 3 was from Mayfield to Stockton; Route 4 from Stockton to Williamtown; Route 5 from Williamtown to Medowie and Route 6 from Medowie to the Pacific Highway. These four routes were all within the Williamtown area, consisting of a large coastal embayment filled by Pleistocene and Holocene sandy deposits. Inner barrier transgressive dunes comprised the majority of the topography.

The majority of the area had been cleared of vegetation apart from grasses, with the exception of the Medowie to Pacific Highway route which had a dry sclerophyll forest with a grassy understorey. Route 7 was from Forster to Pacific Palms and Route 8 from Pacific Palms to Smiths Lake. Both of these routes were in the Forster area with a topography of dunes crossing Quaternary deposits of sand. Route 9 was from Stratford to Waukivory in the Gloucester area, covering cleared land with vegetation consisting of open pastures of grasses with only the occasional tree. Route 10 was from Yarras to Ellenborough in the Wauchope area, mostly following the alignment of the old Oxley Highway in an area that was already heavily disturbed. A review of past reports and searches of the NPWS sites register were compiled to inform the basis of a predictive model. This model predicted nine main site types that might have been encountered along the ten routes. These site types were: stone artefact scatters (open sites), shell middens, axe grinding grooves, quarries, scarred trees, Earthen circles, stone arrangements, rock engravings, burials, mythological sites and contact period sites. Multiple searches of the NPWS sites register were undertaken prior to the survey.

No sites were located within the proposed corridors for Routes 1 or 2. No sites were located within the proposed Routes 3 to 6, but 14 sites were registered adjacent to some of these proposed routes. No sites were within Routes 7 and 8, although numerous sites were in the region surrounding them. No sites were located within Route 9 or Route 10, although Route 10 had once had a carved tree in its vicinity, but this appeared to have since been destroyed. No sites or PADs were identified along Routes 1, 2 and 3. Although no sites were within the bounds of Route 4, three middens were recorded in close proximity to the route. No sites or PADs were identified on Routes 5, 6, 7, 8, and 10. The predictive model was accurate in determining the site types within the areas of these routes, but what became apparent on the survey was the level of past disturbance that had impacted on these areas, meaning that sites like scarred and carved trees had been destroyed by vegetation clearance. The sites that were identified on the survey are summarised in Table 6.4.

Table 6.4 Summary of sites (Davies 1993)

Site	Site type	Landform	Distance to water	Stream Order	Artefacts/ Features	Disturbance	Subsurface potential
Midden 1	midden	foreshore	not noted	Hunter River (6 th)	shell	high (dissected by road)	yes
Midden 2	midden	foreshore	not noted	Hunter River (6 th)	shell	high (house, outbuilding construction)	no
Midden 3	midden	foreshore	not noted	Hunter River (6 th)	Shell including cockle, oyster and whelk	high (dissected by Fullerton Cove Rd)	yes

Since no archaeological material was identified on any of the routes (with the three shell middens encountered during the Route 4 survey being outside the impact area) it was recommended that the proposed works go ahead. It was recommended that no deviation from the surveyed areas take place during construction works and that if any archaeological material be discovered during works that they immediately cease and the appropriate authorities be notified.

- Resource Planning Pty Ltd. 1994. Archaeological Survey Part Lot 16, DP 258848 Fern Bay, NSW. Report to Howship Holdings Pty Limited.

Resource Planning Pty Ltd (1994) undertook an archaeological survey to assess the likely impact of development of the archaeological resource of Lot 16, DP 258848. This area of land had previously been identified for conservation in an environmental assessment due to its wildlife conservation value. A part of Lot 16, DP 258848 however was given the proposed rezoning 1 (d) Rural (future investigation). It was this section of Lot 16 that comprised the study area for this report. The study area was located to the northeast of the Fern Bay township, on the eastern side of Nelson Bay Road and was approximately 40 hectares in size. The topography comprised a dual barrier dune system consisting of an outer barrier and an inner barrier. The study area was situated on the inner margin of the outer barrier in association with 4500 BP transgressive dunes. Vegetation in the study area consisted of swamp forest and dry sclerophyll forest on steep sided transgressive sands with *Angophora costata*, *Eucalyptus pilularis* and *Banksia serrata*. A search of the NPWS sites register identified two previously recorded sites within the study area. One of these sites, 38-4-0134, was not able to be located on the survey. A third previously recorded site was identified in a 1992 report by Dean-Jones referred to as Fern Bay 8. It was concluded that Fern Bay 8 was the same as the second AHIMS registered site in the area, being 38-4-0135. Along with a site called Fern Bay 7, the site Fern Bay 8 was assessed to be on the perimeter of the swamp forest; neither of these sites was located during the survey. Based on the previous recordings and a study of past reports relating to the area it was concluded that middens, open campsites (sometimes with shell) and burials were the most likely site types to occur in the area. Middens were common site types on the outer barrier, with open artefact scatters rare on the outer barrier but commonly occurring on the Pleistocene barrier. It was considered unlikely that burials would occur in the study area, but possible that scarred trees may occur. A random survey sample of the study area was undertaken and concentrated on areas with high visibility, such as walking tracks and animal tracks. Two sites were located and are summarised below.

Table 6.5 Summary of sites (Resource Planning 1994)

Site	Site type	Landform	Distance to water	Stream order	Artefacts /features	Disturbance	Subsurface potential
Site 1	midden	sandy dune deposit	not noted	swamp	oyster shell	not noted	no
Site 2	midden/ artefact scatter	sandy dune deposit	50m	swamp	5 Nobby's tuff artefacts and oyster shell	not noted	yes

The site types encountered on the survey were of the type predicted; the small number of sites located in the survey may be attributed to the fact that vegetation cover gave low ground surface visibility at the time of inspection. It was recommended that a Consent to Destroy permit be sought for Site 1 and that a Consent to Destroy (with salvage) permit be sought if Site 2 were to be disturbed by the proposed development. Sites located around the periphery of the swamp forest area were considered to be archaeologically significant and it was recommended that they be conserved in a conservation bushland area with walking access only. It was further recommended that should any archaeological material be discovered during development that works cease and the NPWS be contacted.

- Umwelt Australia Pty Ltd. 2003. Aboriginal Archaeological Survey and Assessment of Part Lot 5, Stockton Rifle Range, Fern Bay. Report to GDH Pty Ltd.

Umwelt (2003) investigated an area of Commonwealth land located in a coastal environment, associated with Stockton Bight to the north of Newcastle, NSW. The land was proposed for future sale and development and the investigation was undertaken to identify Aboriginal Archaeological locations of sensitivity within the study area. The area had previously been used as a firing range, with roads, mounds, houses, coastal scrub and dunes in the surrounding vicinity. The topography of the study area included a Holocene relict beach ridge. Modifications had occurred to the dunes in the vicinity of the firing range, including levelling, the construction of buildings and tracks, as well as the erection of stop butts and targets. Marine and freshwater deposits of gravel, sand, silt and clay predominated the study area. The firing range had been cleared with vegetation within its bounds consisting of grasses and weeds. Other vegetation in the area included smooth barked apple, blackbutt, coastal Banksia) coastal tea tree, bitou bush, turpentine, mother of millions, slender rice flower, bracken fern and purple top. A search of the AHIMS register covering an area up to 5 km surrounding the study area identified 62 sites, including 36 midden sites, 18 artefact scatters, five middens with artefact scatters and three isolated artefacts. No previously recorded sites were located within the bounds of the study area. A predictive model based on past surveys in the area and the AHIMS results listed middens, artefact scatters and isolated artefacts as the site types most likely to be located within the bounds of the study area. Considering past disturbance in the area small artefact scatters and shell fragments on the surface in areas of exposure were predicted as most likely to be encountered during the survey. Thick vegetation was noted in some areas during the survey and areas of exposure were targeted for inspection. Two artefact scatters were identified, one on a beach ridge crest and slope (7 artefacts and fragments) and the second on a modified landform (4 artefacts). It was recommended that there were no archaeological constraints within the study area as it was highly disturbed and of low archaeological significance. It was noted however that the area was cited as highly significant to the WLALC and WTAE&OG.

- ERM. 2003a. Electricity Supply Upgrade from Tomago to Tomaree. Indigenous Cultural Heritage Assessment. Report to EnergyAustralia.

ERM (2003a) undertook an identification of impacts in relation to known and recorded archaeological sites as part of an Environmental Impact Statement (EIS) for EnergyAustralia. This covered the proposed upgrading of electricity powerlines from Tomago to Tomaree and on the associated access road from Salt Ash to Tomaree. Various vegetation communities were identified along the proposed routes, including apple-blackbutt, bitou bush, swamp mahogany, broad-leafed paperbark, sedges, swamp oak, salt water couch, melaleuca, casuarina, hakia, banksia, stunted red bloodwood, smooth-barked apple, kikuyu, grasses, purpletop, blackberry, fireweed, dock and bracken. The main water sources in the area were Tillegerry Creek and Fullerton Cove. Past land uses included clearing, agriculture, horse and cattle grazing and breeding, deer farms, hobby farms, mining and quarrying. The Tomaree National Park also stretched along the coastline from Tomaree Head, south to Anna Bay. Based on a review of past studies in the area and a search of the NSW NPWS Aboriginal Sites Register a predictive model was compiled. It was predicted that campsites may occur in the area with hearths and/or artefact scatters containing stone and shell. Other site types predicted to possibly occur included scarred/carved trees, middens and burials. Scarred/carved trees were predicted to occur where clearing had not occurred. Although the presence of burials in the area could not be dismissed it was predicted that the likelihood of discovering any was minimal. The predictive model proved accurate as a mix of artefact scatter/isolated find and midden sites were located. The survey was broken up into geomorphological land forms, consisting of Pleistocene Dunes, Inter barrier depression and the Holocene Dunes. Ten new sites were identified and are summarised in Table 6.6.

Table 6.6 Summary of sites (ERM 2003a)

Site Name	Site type	Landform	Distance to Water	Stream Order	Artefacts/ Features	Disturbance	Subsurface potential
38-4-0647 (A1)	artefact scatter/ midden	dune slope	6m	swamp	29 microliths, cockle/ oyster/pipi	clearing, grazing and easement	moderate to high
38-4-0648 (A2)	artefact scatter/ midden	dune slope	5m	swamp	3 artefacts, cockle, oyster/pipi	cattle grazing and easement	moderate
38-4-0649 (A3)	artefact scatter/ midden	hill slope	not noted	not noted	artefacts and shell	easement, access track, path, grazing	moderate
38-4-0643 (A4)	artefact scatter/ midden	dune crest/dune slope	not noted	not noted	115 artefacts, shell, bone	easement and grazing	high
38-4-0650 (A5)	midden / artefact scatter	Dune	600m	swamp/lagoon	artefacts, shell	driveway and power poles	high
38-4-0651 (A6)	midden	dune crest	not noted	not noted	various shells	access road, WWII tank traps	moderate
38-4-0652 (A7)	midden	dune crest	not noted	not noted	various shells	access road, WWII tank traps	moderate
38-4-0653 (A8)	midden	not noted	not noted	not noted	various shells	erosion	moderate
38-4-0664 (A9)	isolated find/ midden	dune slope	not noted	not noted	broken flake with usewear, shell pieces	erosion, burnt tree	low to moderate
38-4-0676 (A10)	midden / artefact scatter	dune slope	6m	swamp	9 artefacts, cockle, mud oyster shell, fish/lizard/ bird, kangaroo bone	agricultural clearing and cattle grazing	moderate to high

In addition, five previously recorded sites, 38-4-0313, 38-4-0485, 38-4-0658, 38-4-0660 and 38-4-0661 were relocated and seven PADs also identified, two located on the Inner Pleistocene barrier system and five on the Holocene Barrier System. ERM concluded that the proposed works would impact on a number of sites (38-4-0649, 38-4-0650, 38-4-0664) and all the identified PADs. Recommendations included mitigation measures to protect those sites that could be preserved from damage or destruction as a result of the proposed works. It was recommended that EnergyAustralia undertake test excavations on PADs 1 to 7 and that the following sites be fenced with a buffer zone: 38-4-0647, 38-4-0676, 38-4-0664 and 38-4-0643. It was also recommended that sites 38-4-0468 and 38-4-0649 be preserved by the most appropriate method (such as by covering the site with biodegradable netting,

sand and grass). A partial consent to destroy permit was recommended for 38-4-0650. The following sites were recommended for both fencing and conservation through methods such as biodegradable netting, sand and grass coverings: 38-4-0659, 38-4-0660, 38-4-0661, 38-4-0313 and 38-4-0485.

- ERM. 2003b. Electricity Supply Access Road – Tomago to Salt Ash. Indigenous Cultural Heritage Assessment. Report to EnergyAustralia.

ERM (2003b) undertook an archaeological assessment for a proposed access road from Tomago to Salt Ash. The general route of the road was known at the time of investigation, but the exact location was subject to change necessitating that the survey included a number of alternative routes. The study area included areas from the existing Tomago substation and extended east through the Pleistocene dunes, the Inter Barrier depression, the Holocene dunes and ended at Salt Ash. EnergyAustralia proposed to construct a 5m wide continuous road along the route, running to a length of approximately 16km. Access points from the road to each pole for substation line construction and maintenance were also required. Other proposed works included laying geotextile fabric, laying car and truck tyres, filling and capping with crushed rock/recycled concrete, depositing sand and spreading grass seed. The proposed access road was predominantly placed through disturbed pasture grassland, containing kikuyu, couch, dock, blackberry, fireweed and purpletop. Other vegetation was noted in occasional patches and included: swamp oak, salt water couch, sedges, smooth-barked apple, blackbutt, red bloodwood, bracken fern and wallum banksia. Lantana was noted in some areas, and alligator weed infestations were noted in association with drainage lines. The main water sources were Tillegerry Creek and Fullerton Cove with a series of floodgates, tidal flaps, drains and levees occurring along the drainage network. Past disturbances included agriculture, horse and cattle grazing and breeding, deer farms, hobby farms and residential development.

A search was undertaken of the NPWS AHIMS register, showing 91 Aboriginal sites to have been registered within the Tomaree peninsula. These included 54 middens, 26 open campsites, five scarred trees, one burial, one shelter with art, one shelter with midden and three isolated finds. Seven middens and eight sites recorded by ERM in 2002 (not yet on the AHIMS register) were also taken into consideration. A predictive model was compiled based on previous heritage studies and the AHIMS results. The predictive model stated that the site types most likely to occur throughout the Pleistocene and Holocene portions of the study area were campsites, scarred trees, middens and burials. The most likely types were middens and campsites; burials were considered unlikely and scarred trees were only possible in areas that had not been cleared. No sites were expected to be found in the interbarrier depression portion of the study area.

A total of six sites were recorded on the survey, two of which (A2 and A4) were avoided on the final route for the proposed road. The predictive model proved accurate as the site types encountered were all artefact scatter/isolated find and midden sites. The sites that were identified included those previously identified during the ERM 2003a assessment. In addition, one PAD was also identified on the inner Pleistocene dune. ERM concluded that the proposed development would involve minimal changes to the current landscape. The proposed works would avoid sites A2 and A4; PAD1 and part of A3 and A9 would be impacted by construction and maintenance. Sites A1 and A10 were to be protected. Recommendations included subsurface testing in PAD1, fencing sites A1, A3, A4, A9 and A10 including a buffer for their protection. A partial consent to destroy was recommended to cover those areas of A3 and A9 that would be affected by construction.

- Wild Thing Environmental Consultants. 2004. Aboriginal Archaeological Heritage Impact Assessment for the proposed Aged Care Development at Lot 187 DP 749482 (No. 160) Fullerton Cove Road, Fullerton Cove, NSW. Report to Craig McGaffin, Buildev Group.

Wild Thing Environmental Consultants (2004) undertook preliminary Aboriginal Heritage studies of a 26-hectare area of land identified as Lot 187 DP749482 (No. 160) Fullerton Cove Road. At the time of inspection, the study area was designated as rural agricultural land and had been utilised for grazing. In addition to stock grazing and vegetation clearance the central portion of the study area had been impacted in the past by the laying of fill. The area had previously been swampy in nature and the deposition of fill had adapted the low-lying areas for stock grazing purposes. Rubbish dumping had also been undertaken in the area. The northern portion of the study area adjoined rural residential blocks. The proposed works included the construction of 238 self-contained units with ancillary facilities and services, including community centre, picnic area and swimming pool. The topography of the study area was a flat area on the western side of Nelson Bay Road with a small rise in the north-western corner and a drainage easement in the central portion running from east to west. Vegetation at the time of inspection was predominantly composed of grasses used for pasture, but other vegetation types included mangroves and casuarinas with Swamp Mahogany and Paperbark Swamp Forest dominating the northern and southern ends of the study area. Other species identified during the survey included Broad-leafed Paperbark, Prickly-leafed Paperbark, Swamp Paperbark, Forest Red Gum, Swamp she-oak, Swamp Mahogany, as well as couch, buffalo grass, Kurnell Curse, River Buttercup, Lantana, Blackberry, Bracken, Rasp Fern and Scotch Thistle. Three small dams were located in the study area and other sections were noted as being waterlogged at the time of the survey.

A search of the NPWS Aboriginal sites database revealed 49 sites within a five-kilometre radius of the study area, including 19 midden sites, 11 open camp sites, five midden/open camp sites and 14 isolated finds. Based on these search results and reference to past archaeological survey in the area a predictive model was compiled stating that Aboriginal activity in the study area would have consisted of the general activities of a hunter gatherer lifestyle; middens may occur in this area with the possibility of associated hearths. Artefact scatters and isolated finds may be encountered but scarred trees were not expected to occur due to vegetation clearance. It was also stated that the area may have cultural significance associated with the presence of waterholes. One moderately disturbed shell midden/artefact scatter was identified and included oyster shell, mudstone flakes (9) and 4 cores. The site type conformed with the predictive model that had been compiled for the area and it was posited that poor archaeological visibility encountered during the survey as well as past disturbance in the area may have accounted for only one site being recorded. Large deposits of Sydney Rock Oyster, Mud Whelk and Cockle Shell were located along the extent of the western boundary as well as in the south-western corner of the study area. It was recommended that all cultural material from the Fullerton Cove Site 1 midden site be collected by WLALC and relocated within the area of Swamp Forest, a section of the study area that was to remain relatively undisturbed. It was noted that these activities would require a Section 90 Consent to Salvage application to be prepared by an archaeologist in consultation with WLALC.

- ERM. 2005. Fern Bay Estate Aboriginal Heritage Assessment Report. Report to Winten Property Group & Continental Venture Capital Limited.

ERM (2005) undertook archaeological excavations of Lot 16, DP 258848, No. 85 Nelson Bay Road, Fern Bay. This report followed on from an interim report on excavations completed for NPWS in July 2001. The study area comprised of approximately 205 hectares of land adjacent to and to the east of Nelson Bay Road, midway between Stockton Beach and Fullerton Cove. The topography of the study area comprised of naturally stabilised dune systems with interdunal depressions and past

disturbances included four-wheel drive vehicle tracks, clearing and excavation work. Three main vegetation communities characterised the area, being apple-blackbutt forest, heath community with mahogany-paperbark forest and swamp sclerophyll forest. A Section 90 consent with salvage was issued by the Department of Environment and Conservation for archaeological sites within the approved subdivision footprint. As this report followed on from earlier reports by ERM (including a Statement of Environmental Effects in 2000) items such as a predictive model and AHIMS search results had already been covered in earlier works and were not included in this report. Mention is made in this report of a predictive model developed by Dean-Jones in 1992 stating that archaeological evidence was most likely to be concentrated on elevated ground in close proximity to freshwater within the inner stable dune. The excavation methodology was outlined with a number of objectives, including working in partnership with WLALC, identifying the extent, nature and significance of archaeological deposits within the study area, ascertaining topographic locations of high archaeological sensitivity, testing known sites and undertaking post-excavation analysis. The known sites were tested for subsurface deposits during Phase 1 investigations and included Fern Bay Estate Site 7 - auger testing did not locate any subsurface material; Fern Bay Site C - surface collection, auguring and test pits uncovered intact A-horizon soils containing high densities of stone artefacts and shell; Fern Bay Estate Site 8 - surface collection, auguring and test excavation revealed intact A-horizon soils containing low densities of stone artefacts and very low densities of shell; Fern Bay Estate Site 11 - test excavation and auguring located no archaeological material on ground surfaces or from excavated deposits; and Fern Bay Estate Site 16 - artefacts had been located during past test pit excavation, but auguring during these works did not locate any further archaeological material.

Phase 2 investigations involved auguring along 10 transects. Archaeological material was uncovered in transects 6, 7, 9 and 10. The frequency of archaeological material detected by the auger excavations was low. In Phase 3 of investigations further test pits were excavated with locations based on the transect results from Phase 2. The site areas excavated included Fern Bay Site D - 84 stone flakes, pieces and cores were recovered from nine spits; Fern Bay Site E - 355 shell fragments and 49 stone flakes, pieces and cores were recovered from nine spits; and Fern Bay Site F - No archaeological material was found during this excavation (only an isolated find was located during auguring). The new site areas that were identified and excavated as a result of these works are summarised in the table below.

Table 6.7 Summary of sites (ERM 2005)

Site Name	Site type	Landform	Distance to water	Stream order	Artefacts/Features	Disturbance
Fern Bay Site D	artefact scatter	low ridge crest	not noted	not noted	84 stone flakes, pieces and cores	4WD track
Fern Bay Site E	artefact scatter/midden	low ridgeline	not noted	not noted	355 shell fragments and 49 stone flakes, pieces and cores	not noted
Fern Bay Site F	isolated find	not noted	not noted	not noted	1 artefact	not noted

During Phase 3 of works material was also collected from an overburden mound. It was concluded that the test excavations demonstrated that The Fern Bay study area contained a high density of

Aboriginal sites, particularly on low ridgelines within the 4000 BP stable dune. Archaeological excavation revealed stone artefacts, shell middens and an Aboriginal hearth, providing information about the social, economic and cultural life of Aboriginal people who lived at Fern Bay prior to European settlement. It was recommended that for future work along the Stockton Bight area that low ridgeline landforms and areas on the margins of swamp forest within Holocene dune sequences be considered of high archaeological sensitivity. Where possible it was recommended that such areas be excluded from development or, if that is not possible, be subject to controlled archaeological excavation.

- MCH 2004. Proposed sewerage pipeline, Fern Bay. Indigenous Cultural heritage Assessment. Report to Hunter Water Australia.
- MCH 2005. Proposed sewerage pipeline, Fern Bay. Stage one test excavations. Report to Hunter Water Australia.

MCH (2004, 2005) undertook test excavations at a selected number of proposed borehole locations associated with the intended sewerage program at Fern Bay. Based on the results of the initial survey and traditional knowledge, the proposed sewerage scheme was identified as being situated in an area of very high archaeological potential. Subsequent ground penetrating radar investigations were conducted at the borehole locations and identified seven locations where test excavations were necessary and this assessment detailed the results of this investigation. For comparability and continuity across the site as well as the size of the geotechnical investigations, all test pits were one x one metre. All trenches were excavated by shovel and trowel in 10-centimetre spits to approximately one metre, or until collapse occurred, at which point the excavation at that location ceased due to safety. Excavation also halted if the walls of the pit were deemed to be unstable making any further excavation unsafe. This occurred in FB7 and FB24 at depths of 80cm and 90cm respectively. A total of 23 artefacts were recovered from a total of 8 test pits and were manufactured from tuff and silcrete only. Artefact types included flakes, broken flakes, flake pieces and cores. A relatively large volume of shell material was recovered from FB14 and consisted largely of oyster shell. Unfortunately, based on the generally fragmented samples, it was not possible to clearly distinguish between mud oyster and rock oyster, although, on a basic level, the majority of the shell is that of the rock oyster (*Saccostrea glomerata*) and all species of shell present in FB14 were known to inhabit estuarine environments. Additional test excavations and salvage were recommended.

- MCH. 2008. Proposed sand extraction operation at Fullerton Cove. Indigenous archaeological assessment. Report to Orogen Pty Ltd.

MCH (2008) undertook an assessment for the proposed sand extraction operations at Coxs Lane, Fullerton Cove. The study area is located within the current project area. Land uses within the project area included clearing and sand mining. RZM Pty Ltd undertook sand mining activities between April 1975 and September 1977 as part of their Cox's Lane Operation. RZM provided a plan which shows the mining area, the monthly progress of the mine and the reduced level of the pond water level. The resulting landscape of the majority of the site, including the entire area proposed for the current sand extraction project, included the tailings dump of the previous heavy mineral sand mining operation on the site. Hence, the land area of the site proposed for sand extraction has been extensively modified by the previous RZM operations on the site. One large artefact scatter was identified (FCSE 1), however, the artefacts were not in-situ, due to previous mineral sand mining activities which had resulted in the artefacts being dispersed over a large area of the mine tailings. There was no intact stratigraphy as there was extensive displacement of the original sand and soils of the site. As the project fell under Part 3A, an AHIP was not required and MCH recommended community collection.

- RPS. 2010. Aboriginal Archaeological Excavation Works Stage 2 AHIP #3 157-1 I 01504 Williamtown Aerospace Park. Report prepared for Williamtown Aerospace Park.

RPS (2010) completed an archaeological test excavation and surface collection of Stage 2 sites covered in the Aboriginal Heritage Impact Permit #3157-1101504. The investigation area was located about 15 kilometres to the north-east of Newcastle, on the western side of Nelson Bay Road in Williamtown within Lot 11 DP 1036501. Past impacts in the investigation area included sand mining. Landforms across the investigation area consisted of dunes and foreshore area, being predominantly situated both on the Inter-Barrier Depression and on a portion of remnant sand dune which formed part of the Newcastle Bight sand barrier system. The investigation area was situated on the Tomago Sand beds, which derived from Holocene and Pleistocene Aeolian and marine sand deposits. The deposits had been extensively reworked to form dune systems and sand sheets of Quaternary sediments, including Aeolian and marine sand deposits as well as silt and clay deposits. A small vegetated sand dune was situated in the area and flora species were recorded from nine vegetation communities, being: Coastal Sand Apple-Blackbutt Forest, Coastal Sand Wallum, Coastal Wet Sand Cyperoid Heath, Coastal Wet Sand Cyperoid Heath regrowth, Freshwater Wetland Complex, Scrub - *Leptospermum juniperinum*, Scrub - *Melaleuca ericifolia*, Swamp Mahogany - Paperbark Forest and Swamp Oak - Rushland Forest. Drainage depressions and heath swamp areas were the main water sources for the area, with the swamplands having supported rich resources. The Research Design and Methodology for the archaeological excavation of the investigation area was developed based on the previous work in the area and discussions with the Aboriginal community. Proposed research questions included discovering if the site extended into the Pleistocene level of the dune, if use wear analysis could indicate resource exploitation and if there were differences in tool reduction processes and raw material uses.

Nine geoarchaeological test pits were excavated as part of the archaeological investigation. Two archaeological test trenches were excavated for the salvage of Aboriginal artefacts and the recording of any relevant features. Test Trench 1 (TT1) excavated six cubic metres of sand/soil material and Test Trench 2 (TT2) excavated two cubic metres of the same. Cultural material was only recovered from TT1, which also contained two Aboriginal hearths, one with charcoal. Radiocarbon dating of the charcoal gave the result of conventional age or percent modern carbon. Surface collection was undertaken at AHIMS sites #38-4-0301 and #38-4-1146. A total of 1695 artefacts were identified through test excavation. This included 1023 angular fragments, 569 flakes, 30 pieces of ochre, 27 tools, 24 manuports and 22 cores. Raw materials used in artefact manufacture included tuff (being the most common), silcrete, Mafic volcanic, quartz, Felsic volcanic, sedimentary and quartzite.

The site did not extend into the Pleistocene dune level. The majority of tools were backed artefacts which did not exhibit signs of use. A total of 89 percent of complete flakes were tuff and 87 percent of backed artefacts were made from tuff. This pattern was assessed as likely due to the higher availability of tuff as an abundant primary source of tuff was available within 13 kilometres of the site. It was concluded that Aboriginal people were utilising the location during the late Holocene period. The high density of artefacts, compact shell deposits and the presence of two hearths indicated intensive use over a period of time. However, the small amounts of food resource material (shell and bone) recovered indicated that the site was not inhabited for an extended period. It was concluded as unlikely that large numbers of Aboriginal people had used the site. It was stated that no further archaeological work was required in the investigation area. All land within the investigation area had been subject to previous archaeological surveys, a surface collection programme of AHIMS sites #38-4-0301 and #38-4-1146 and archaeological test excavation (although none of these reports were listed on AHIMS).

RPS recommended that an Aboriginal Heritage Impact Permit (AHIP) under Section 90 of the National Parks and Wildlife Act (1974, as amended) should be sought in order to allow future

proposed works to go ahead. All relevant staff and contractors should be made aware of their statutory obligations for heritage and if Aboriginal site/s are identified, the site Project Manager is to contact RPS and the relevant Aboriginal stakeholders so they can adequately assess and manage the site. Finally, that in the unlikely event that skeletal remains are identified, work must cease immediately and appropriate assessment be undertaken.

- MCH 2012. Glasshouse, Williamtown. Aboriginal Heritage Impact Assessment. Report to ADW Johnson.

MCH (2012) undertook an Indigenous Archaeological Assessment for the proposed 32HA Glasshouse Development located at 157 & 183 Cabbage Tree Road, Williamtown Lot 1331 DP 609173 & Lot 1332 DP 609173. The proposed development was a 16.4ha glasshouse facility for vegetable growing, storage and distribution and includes associated buildings incorporating ancillary facilities such as offices, storage and test growing rooms, irrigation and boiler equipment, canteen facilities, employee amenities, car parking areas and access roads, landscaped / green areas, storage basins for roof rainwater, removal and replacement of an existing regional open drain on site, and construction of a compacted earth bund (approximately 3m high above natural ground level) around the perimeter of the development footprint. No excavation or fill was proposed, the buildings were proposed to be constructed at ground level. The study area was situated within the inter-barrier depression and is located on the flood plains of the Hunter River and includes swamps/ wetlands with a manmade dam roughly through the centre (east west) and two man made drains one along the western boundary and the other along the southern boundary. This landform context of the study area was not considered to be suitable for occupation, rather the surrounding elevated dunes overlooking the inner barrier depression would be considered more suitable. Vegetation was very dense at 1% and exposures were minimal. No sites or PADs were identified which fit the predictive model. No culturally significant sites were identified by the Aboriginal stakeholder representatives on site or during the consultation process as past occupation was focused on the elevated Holocene and Pleistocene dunes overlooking the interbarrier depression.

- Umwelt Australia Pty Ltd. 2012. Report on salvage works conducted under AHIP #3382, Tomago, NSW. Report prepared for Ausgrid.

Umwelt (2012) undertook a surface collection and salvage excavations at specific locations within a previously recorded site and PAD within the Tomago to Williamtown power line project area. These works were to be undertaken in proposed areas of impact for a new 33 kilovolt (kV) feeder extending from Tomago to Williamtown, north of Newcastle, NSW. These works were undertaken under the conditions of Aboriginal Heritage Impact Permit (AHIP) #3382. The topography of the study area consisted of a slope within a large dual barrier formation known as Stockton Bight. Stockton Bight was composed of an inner barrier of Pleistocene age (referred to as the Inner Barrier), a seaward barrier of Holocene age (referred to as the Outer Barrier) and a low-lying swampy depression that divided the barriers and was known as the Inter-Barrier depression. In the Aboriginal past the closest water source would have been a large estuarine swamp containing pockets of freshwater swamps, with other swampy areas surrounding. The beach ridge and dune formation would have also hosted a variety of vegetation, which had since been cleared. A past assessment had three identified sites A1 (#38-4-0647), A2 (#38-4-0648) and A10 (#38-4-0676) and an area of Potential Archaeological Deposit (PAD1 - #38-4-0679) in the study area. This report detailed the results of salvage works at these locations. No surface artefacts were located in the study areas so surface collection was not undertaken. Excavations were conducted at proposed pole locations, each marked out as a two metre by two metre square, divided into four one by one metre squares, and further subdivided into four quadrants of 50 centimetres by 50 centimetres. All excavated material was passed through a three-millimetre gauge sieve. The salvaged assemblage consisted of only 10 artefacts. All artefacts were

manufactured from Nobbys tuff and were predominantly broken flakes, with four complete flakes and one flaked piece. Of the complete flakes, the largest flake exhibited signs of use on its distal margin. The artefacts were all relatively small and did not include any formal tool types such as geometric microliths. Umwelt recommended the artefacts be reburied following the completion of the proposed works, in accordance with Requirement 26 of the Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales.

- MCH. (2022). Williamtown SAP Structure Plan. Aboriginal cultural heritage and archaeological desk top assessment. Report to ERM.

MCH undertook an abbreviated Aboriginal Cultural Heritage Assessment (ACHA) for the proposed Williamtown Special Activation Precinct (SAP). It has been designed to assess the Aboriginal heritage potential of the SAP, as based on the Structure Plan (SAP boundary). The Structure Plan was developed from a series of Enquiry by Design Workshops and this assessment aims to establish the relevant specifications and requirements to assist in the implementation of the Structure Plan.

The geomorphology of the area is complex and the SAP boundary consists predominantly of the interbarrier depression (previously a lagoon) with dunes to the north overlooking the interbarrier depression, which are locations favoured by past Aboriginal people for camping due to the abundance of resources. In terms of water and resource availability, the SAP boundary includes the resource rich inter-barrier depression or swamp (previous lagoon/estuary). The area was very well resourced in terms of fresh water and associated resources as well as marine resources. The interbarrier depression was clearly favoured for hunting and gathering with little to no evidence of past Aboriginal land uses, with the elevated dunes overlooking the interbarrier depression and the beach areas having being favoured for camping in close proximity to these resources.

A search of the AHIMS register has shown that six known Aboriginal sites are currently recorded within one kilometre of the SAP boundary. This excludes sites identified within the RAAF Base (Commonwealth) land as there is no legislative requirement for sites on Commonwealth land to be registered on AHIMS. A number of sites were located in the project area.

Based on a review of the previous assessments throughout the region and supported by the AHIMS results, the following archaeological patterns have been reported and are considered within this assessment:

- sites are generally within 50 metres of reliable water;
- sites are located on both the Holocene and Pleistocene dunes overlooking the interbarrier depression;
- sites are not usually found in the interbarrier depression;
- there is a decrease in site numbers and site densities between the Inner Holocene dunes and the beach front;
- site types are typically shell middens with various shell species, stone tools and may also contain charcoal, fish and animal bone;
- artefact scatters, isolated finds, scarred trees, burials and ceremonial sites may also be found along the dunes;
- artefacts typically date to the Holocene but Pleistocene sites may be present in the Pleistocene dunes;
- raw materials are tuff obtained locally and/or silcrete, chert or quartz that have been traded/transported from the Hunter Valley area; and

- stone artefacts are typically flakes, flake pieces, broken flakes, cores and tools with fish hooks manufactured from local shell.

Within the SAP boundary, AHIMS sites were identified within the Inner Barrier Dune system, all in close proximity to the interbarrier depression, or swamp lands. Based on the AHIMS sites, past research undertaken throughout the region and locally, as well as the geomorphological studies and traditional knowledge within the SAP boundary, locations of high cultural and archaeological potential were identified. These were located within the northern portion of the SAP boundary that overlooks the swamp lands (inter barrier depression) and includes the interfaces of the swamp lands and dune. A number of site types are likely to occur including shell middens, artefact scatters, isolated finds, scat trees, camp sites (with middens, artefacts, evidence of cooking and food preparation, knapping etc) and burials. Previous assessments and traditional knowledge have also identified that burials are located throughout the dunal system, and as one has been previously identified within the SAP boundary, there is a very high potential for additional burials to be located in the dunes in the Precinct.

6.4 HERITAGE REGISTER LISTINGS

The State Heritage Register, the National Heritage List, the Commonwealth Heritage List, the National Trust Heritage Register and the relevant Local Environmental Plan have no Aboriginal objects, sites or places listed.

6.5 SITES WITHIN THE PROJECT AREA

As indicated in Figure 6.3, there appears to be three sites in the project area. Examination of the site cards have located the correct location of these sites and are shown in Figure 6.4

Figure 6.3 Location of AHIMS sites based on AHIMS coordinates



Figure 6.4 Location of AHIMS sites based on site card information



Site 38-4-1645 is a small shell midden recorded in 2014 and is located on the eastern side of Fullerton Cove Rd on the road verge on the southern side of Coxs Lane. The verge is located at 306 Fullerton Cove Rd. This site is approximately 40 metre in length and up to 10 metres in width. This site consists of a shell midden (oyster fragments) with 3 tuff stone artefacts within a deflating sand dune on the margin of the transgressive dune system of the Stockton Bight Outer Barrier and the estuarine flats of Fullerton Cove. It appears that the midden material is deflating towards Fullerton Cove Road from further upslope.

Site 38-4-2011 is artefact scatter along George Street. The site contained 23 surface artefacts and 2 subsurface artefacts. The landform and subsurface soil profile was highly modified.

Site 38-4-2047 is an isolated artefact located along Fullerton Cove RD south of Coxs Lane. It is highly likely this site is part of site 38-4-1645.

Site 38-4-1035 is a highly disturbed large artefact scatter. Due to previous mineral sand mining activities, the artefacts were dispersed over a large area of the mine tailings. There was no intact stratigraphy as there was extensive displacement of the original sand and soils of the site.

Site 38-4-0706 is an artefact site. Unfortunately, AHIMS has no report or site card for this site and as such no further information can be provided and it remains unknown if the site coordinates are correct.

6.6 LOCAL & REGIONAL CHARACTER OF ABORIGINAL LAND USE & ITS MATERIAL TRACES

Variations between archaeologists' classifications of raw material types (for example tuff and indurated mudstone) will have an effect on the results of this count. Raw material type was not

indicated in most reports and as such general comments are made. Again, this information is presented merely as an indication of what may be expected.

Due to differences in recording techniques it is difficult to determine how many of each artefact type is represented across the region though types include flakes, broken flakes, retouched flakes, multi-platform cores, single platform cores, bipolar cores, flaked pieces, 'waste' pieces, 'chips', debitage, 'geometric microliths', 'backed blades', 'bondi points', 'scrapers', 'eloueras', 'burrins', 'blades', 'hatchets', 'unifacial choppers', 'bifacial choppers', edge-ground axes, anvils, hammer stones and heat. Due to variations in both the amount of data that is included in reports, and the terms different archaeologists used to describe artefact types, it is not practicable to provide a count of the different artefact types. However, it is evident that flakes, broken flakes and flaked pieces are the most common artefact types recorded.

The following is a summary of the previous investigations detailed in Section 6.1 and 6.4. It must be remembered, however, that there are various factors which will have skewed the results discussed previously. Therefore, the summary provides an indication of what may be expected in terms of site location and distribution.

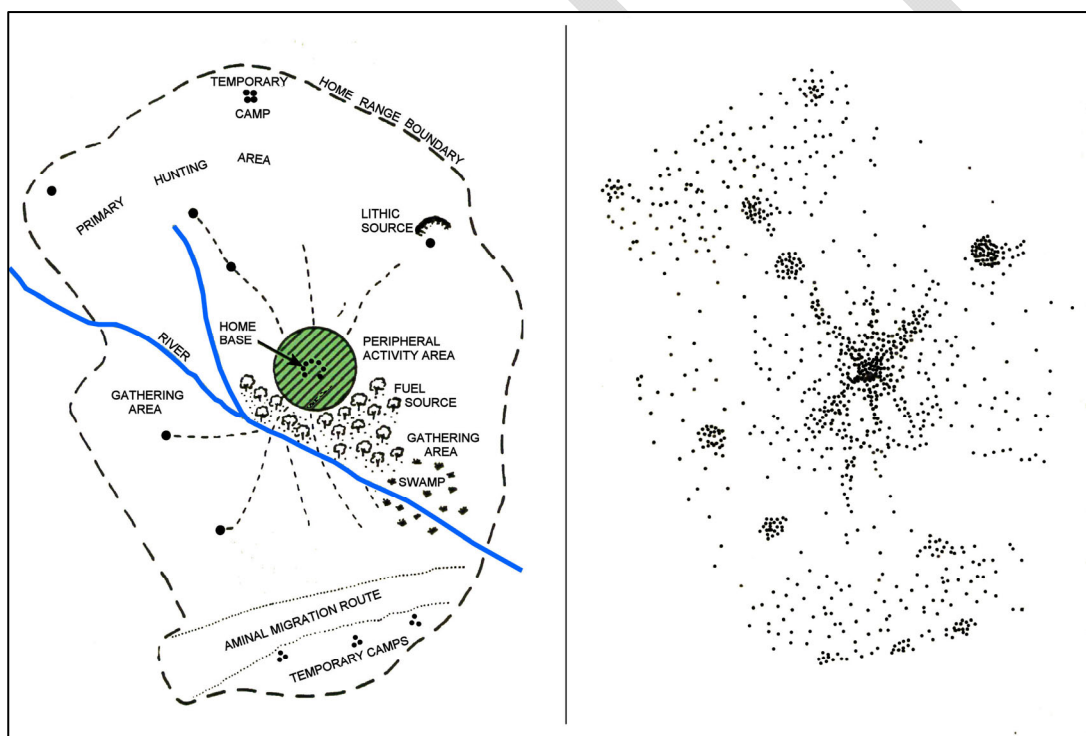
- sites are generally within 50 metres of reliable water;
- sites are located on both the Holocene and Pleistocene dunes overlooking the interbarrier depression;
- sites may be present at the interface of the interbarrier depression and the dunes;
- sites are not usually found in the interbarrier depression;
- there is a decrease in site numbers and site densities between the Inner Holocene dunes and the beach front;
- site types are typically shell middens with various shell species, stone tools and may also contain charcoal, fish and animal bone;
- artefact scatters, isolated finds, scarred trees, burials and ceremonial sites may also be found along the dunes;
- artefacts typically date to the Holocene but Pleistocene sites may be present in the Pleistocene dunes;
- raw materials are tuff obtained locally and/or silcrete, chert or quartz that have been traded/transported from the Hunter Valley area;
- stone artefacts are typically flakes, flake pieces, broken flakes, cores and tools with fish hooks manufactured from local shell.

6.7 MODELS OF PAST ABORIGINAL LAND USE

The aim of this assessment is to attempt to define both the nature and extent of occupation across the area. As a result, the nature of the analysis will focus on both landform units and sites. The purpose of this strategy is to highlight any variations between sites and associated assemblages, landforms and resources across the area treating assemblages as a continuous scatter of cultural material across the landscape. In doing this, it is possible to identify land use variations across the landscape, landforms and assemblages that correspond with variation in the general patterns of landscape use and occupation. Thus, the nature of activities and occupation can be identified through the analysis of stone artefact distributions across a landscape. A general model of forager settlement patterning in the archaeological record has been established by Foley (1981). This model distinguishes the residential "home base" site with peripheral "activity locations". Basically, the

home base is the focus of attention and many activities and the activity locations are situated away from the home base and are the focus of specific activities (such as tool manufacturing). This pattern is illustrated in Figure 6.4. Home base sites generally occur in areas with good access to a wide range of resources (reliable water, raw materials etc), and the degree of environmental reliability, such as reliable water and subsistence resources, may influence the rate of return to sites and hence the complexity of evidence. Home base sites generally show a greater diversity of artefacts and raw material types (which represent a greater array of activities performed at the site and immediate area). Activity locations occur within the foraging radius of a home base camp (approximately 10 km); (Renfrew and Bahn 1991). Based on the premise that these sites served as a focus of a specific activity, they will show a low diversity in artefacts and are not likely to contain features reflecting a base camp (such as hearths). However, it is also possible that the location of certain activities cannot be predicted or identified, adding to the increased dispersal of cultural material across the landscape. If people were opting to carry stone tools during hunting and gathering journeys throughout the area rather than manufacturing tools at task locations, an increased number of used tools should be recovered from low density and dispersed assemblages across the landscape.

Figure 6.5 Foley's model (L) and its manifestation in the archaeological record (R), (Foley 1981).



6.8 MODEL OF OCCUPATION FOR THE REGION

Work throughout NSW has aimed to understand the nature of Aboriginal occupation and determine the nature of land use. This theme often aims to identify and explain archaeological patterning in site type, content and distribution. General theories have been developed outlining the relationship between land use patterns and the resulting archaeological evidence. A number of models developed for the region have been reviewed (McBryde 1976; Koettig 1994; Dean-Jones and Mitchell 1993; Rich 1995; Kuskie and Kamminga 2000). All models state that the primary requirements for repeated, concentrated or permanent occupation is access to reliable fresh water. Brief and possible repeated occupation may be represented in areas that have unreliable access to ephemeral water sources, however, these areas will not contain high archaeological evidence or potential (Goodwin 1999).

Kuskie and Kamminga (2000) established a general model of occupation strategies based primarily upon ethnographic research. Used as a starting point, it makes a general set of predictions for the region that is consistent with other studies (e.g., Nelson 1991). The model distinguishes between short-term or extended long-term occupation and makes some predictions about the likely location of different foraging and settlement activities. Combining this information with a general review of assemblage contents from a sample of excavated sites within the region, a baseline of settlement activities may be determined (Barton 2001).

The model provides a number of archaeological expectations that may be tested. For example, the presence of features requiring a considerable labour investment such as stone-lined ovens or heat-treatment pits are likely to occur at places where occupation occurred for extended periods of time. The presence of grindstones is also a reliable indicator of low mobility and extended occupation. Seed grinding requires a large investment of time and effort (Cane 1989). In most ethnographic examples, seed grinding is an activity that takes place over an entire day to provide adequate energetic returns (Cane 1989; Edwards and O'Connell 1995).

Where group mobility was high and campsites frequently shifted throughout the landscape, artefact assemblages are not expected to contain elements such as grindstones, heat-treatment pits, ovens and the diversity of implements frequently discarded at places of extended residential occupation. It may also have been the case that the location of particular activities could not be predicted by tool users, adding to the increased low-density scattering of artefacts over the landscape. Also, if individuals were opting to carry a number of stone tools during hunting and gathering activities and maintaining these tools rather than manufacturing new tools at each task location, the ratio of used tools to unworn flakes in these assemblages should be high. Table 6.8 has been adapted from Kuskie and Kamminga (2000). The identification of specific activity areas through analysis of the composition of the patterning of lithic assemblages was utilised. However, this is applied to excavated materials as they provide more realistic data due to the lesser degree of disturbances, removal and breakages.

Table 6.8 Site descriptions (Kuskie & Kamminga 2000).

Occupation pattern	Activity location	Proximity to water	Proximity to food	Archaeological expectations
Transitory movement	all landscape zones	not important	not important	- assemblages of low density & diversity - evidence of tool maintenance & repair - evidence for stone knapping
Hunting &/or gathering without camping	all landscape zones	not important	near food resources	- assemblages of low density & diversity - evidence of tool maintenance & repair - evidence for stone knapping - high frequency of used tools
Camping by small groups	associated with permanent & temporary water	near (within 100m)	near food resources	- assemblages of moderate density & diversity - evidence of tool maintenance & repair - evidence for stone knapping & hearths
Nuclear family base camp	level or gently undulating ground	near reliable source (within 50m)	near food resources	- assemblages of high density & diversity - evidence of tool maintenance & repair & casual knapping - evidence for stone knapping - heat treatment pits, stone lined ovens - grindstones

Community base camp	level or gently undulating ground	near reliable source (within 50m)	near food resources	• assemblages of high density & diversity • evidence of tool maintenance & repair & casual knapping • evidence for stone knapping • heat treatment pits, stone lined ovens • grindstones & ochre • large area >100sqm with isolated camp sites
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6.9 PREDICTIVE MODEL

Due to issues surrounding ground surface visibility and the fact that the distribution of surface archaeological material does not necessarily reflect that of sub-surface deposits, it is essential to establish a predictive model.

Previous archaeological studies undertaken throughout the area provide a good indication of site types and site patterning in the area. The research has shown that middens with stone implements, and middens with only shell are the most predominate site types. The most common site locations are the seaward margin of active transgressive dunes/active blowouts, Holocene and Pleistocene dunes overlooking the interbarrier depression and at their interface, and areas near water sources. Predictions about site patterning for the three landforms are discussed.

Outer Pleistocene dunes:

There is a high potential for sites on this landform. Sites are predominantly middens (composed of either or both estuarine and marine shell species) and open camps, with a sparse scattering of cultural material along the ridgelines of the dunes and high-density sites situated on low flat ridgelines immediately adjacent to wetlands. It is predicted that ridges on the margins with the interbarrier depression have high archaeological potential.

Interbarrier depression:

The interbarrier depression was an important area for foraging as indicated by the prevalence of sites on the margins of both the Pleistocene and Holocene dune systems overlooking the depression and at their interface. Although these sites are close to the depression, they are not located within it. Evidence of occupation within the depression is very limited and consists of a scattering of the remnants of midden between Boyces Track and Uralla (Dean-Jones 1990). The interbarrier depression, once the coastal margin and estuarine swamp, is now covered with Holocene estuarine sand, mud and clay ranging in depth from one to ten metres as well as natural shell beds (Robson et al 1992: 13-19). This area has also been extensively disturbed through ploughing, grazing, road construction and development. It is therefore predicted that there is a very low potential for archaeological sites in this landform.

Inner Holocene dunes:

There is a high potential for both middens (including estuarine shell species, especially rock oysters and mud whelk) and open camp sites on the inner landward margin of the Holocene dunes. These dunes are stable and the potential to contain stratified deposits dating back to 4,500 PB (Dean-Jones 1992). Such occupational sequences are often high density and up to one metre in depth. There is a sparse scattering of cultural material along the ridges of this landform and high-density sites are present along the low flat ridgelines overlooking the wetland (interbarrier depression) area.

Outer Holocene backbarrier flats:

There is potential for very low-density shell middens, at times with shell species from the interbarrier depression as well as the ocean. Being located in between the resource rich interbarrier depression

to the west and the ocean to the east, the backbarrier flats (low swampy relief with swales and dunes) and did not contain the abundance of resources but did contain limited resources following rain and there appear to have been taken advantage of whilst travelling in between the two environments with evidence located on the dune crests within this environment.

6.9.1 PREDICTIVE MODEL FOR PROJECT AREA

Based on the AHIMS sites, past research undertaken throughout the region and locally, as well as the geomorphological studies and traditional knowledge, locations of high cultural and archaeological potential have been identified.

The majority of the project area is situated within the dune formations of Holocene age with the western side including the interbarrier depression. Within the project area, five AHIMS sites have been identified within the Holocene dunal system. There is a very high potential for additional sites to be located in the dunal system with the highest numbers and highest density sites being located within 50 metres of the interbarrier depression. These sites will then drop off in both numbers and densities eastwards. Sites will increase in both numbers and densities in close proximity to the beach and pycnanthemum. The areas in between the interbarrier depression and the beach were utilised for travel and hunting and gathering opportunities on the way to each resource rich zone.

The dunes overlooking the interbarrier depression would have enabled large scale camping by large groups of people, which is manifest in the archaeological record as large shell middens with artefacts and evidence of food preparation and cooking.

The areas further away from the interbarrier depression (50m+), the backbarrier flats and dunes provided reduced resources that would have not allowed for large scale camping but would have supported small to medium sized groups of people for hunting and gathering as well as travel in between these two resource rich environments, and this manifests in the archaeological record as a background scatter of stone artefacts and very low-density shell middens.

Considering the past land uses and impacts (clearing, mining, transport depots, residential houses, dams, agricultural activities, and associated infrastructure and utilities), it is unlikely that shallow in situ deposits remain in that area. However, in situ sites are known to be present in deep deposits throughout the local area and as such both surface and subsurface sites may be expected in the project area, with the highest concentrations and highest densities located within 50 metres of the interbarrier depression.

Worimi traditions also indicate that burials are located under shell middens. Burials are often exposed through erosion in the local area and there is moderate potential for burials to be located in the dunes within the project area.

The refinement of this predictive model will be dependent upon an investigation of the range of landforms and the occurrence of modern disturbances within the project area, as determined during a comprehensive survey.

6.10 ARCHAEOLOGICAL POTENTIAL IN THE PROJECT AREA

Based on archaeological sites registered in the region and the results of past archaeological studies, four site types are likely to occur throughout the project area:

- **Artefact scatters**

Also described as open campsites, artefact scatters have been defined as two or more stone artefacts within 50 metres of each other and will include archaeological remains such as stone artefacts and may be found in association with hunting and gathering activities (manifests in the archaeological

record as lo-density discarded artefacts across the landscape) or camping where other evidence may be present such as shell, hearths, stone lined fire places and/or heat treatment pits. These sites are usually identified as surface scatters of artefacts in areas where ground surface visibility is increased due to lack of vegetation and land uses. Erosion, agricultural activities (such as ploughing, grazing), construction and mining activities and access ways can also expose surface campsites. Artefact scatters may represent evidence of;

- Large camp sites, where everyday activities such as habitation, maintenance of stone or wooden tools, manufacturing of such tools, management of raw materials, preparation and consumption of food and storage of tools has occurred;
- Medium/small camp sites, where activities such as minimal tool manufacturing occurred;
- Hunting and/or gathering events;
- Other events spatially separated from a camp site, or
- Transitory movement through the landscape.

Artefact scatters are a common site type in the locality and the broader region. There is potential for artefact scatters to occur within the project area with the highest concentrations and highest densities located within 50 metres of the interbarrier depression. There is also the potential for such sites to be impacted on through past land uses.

- **Isolated finds**

Isolated artefacts are usually identified in areas where ground surface visibility is increased due to lack of vegetation and land uses. Erosion, agricultural activities (such as ploughing), construction and mining activities and access ways can also expose surface artefacts. Isolated finds may represent evidence of;

- Hunting and/or gathering events; or
- Transitory movement through the landscape.

Isolated finds are a common site type in the locality and the broader region. There is potential for isolated artefacts to occur across the project area and across all landforms. There is also the potential for such sites to be impacted on through past land uses.

- **Shell middens**

Shell middens are places where debris from eating shell fish has accumulated. Middens preserve a range of past dietary remains which have the potential to inform about past dietary consumption and availability of food resources. Most shell middens analysed to date pertain to coastal environments with few pertaining to inland middens. In NSW, middens are located on headlands, beaches and dunes, around estuaries, swamps, the tidal stretches of creeks and rivers and along the banks of inland rivers, creeks and lakes. Shell middens may be found in the open or in rock shelters and often those in the open are disturbed through erosion and land use impacts and those in shelters are usually well preserved. The location of middens is influenced by a variety of factors including, but not limited to, the availability of shell fish, aspect, accessibility and the nature of the immediate area and are typically located within a reasonable distance from water on level, sheltered surfaces.

Ranging in size from small scatters to deep layered deposits that have built up over time, the size of the midden may relate to its location (e.g., riverbank middens tend to be smaller than estuarine and coastal middens). Small middens may represent short term occupation or the debris from a single meal. Major estuarine species include bivalves such as cockle, whelk, mud and rock oyster and both edible and hairy mussels. Rock platform species of gastropods include limpets, turban shell, periwinkles, nerits, tritons and cartrut shell fish and the most prevalent beach species is the pipi.

Shell middens may also include fish, sea birds, sea mammals and land mammals. Stone artefacts are also typically found within middens and indicate trade and/or transportation of raw materials. Bone and shell artefacts, such as fish hooks and barbs, as well as evidence of cooking may be present in the form of charcoal, ash, fire stones, hearths, burnt clay and/or burnt earth. The midden usually occurs within a soil or sand layer that is darker than the surrounding sediment. Middens may also contain burials and if present are usually located under the midden.

Preservation varies with food stuffs such as berries and fruits leaving no archaeological traces, sea foods such as cartilaginous fish, stingrays, octopus and fish eggs are likely to be equally invisible in the archaeological record. However, tissue such as shell and crustaceans and bone may be preserved and preservation is dependent on land use impacts and associated soil pH.

An important contribution to the study of coastal shell middens was made by Meehan (1975, 1977a, b) through ethnographic studies of coastal hunter and gatherers in northern Arnhem Land. Through a yearlong quantitative record of the total diet, Meehan provides unique insights into all aspects of shell fish gathering and the creation of shell middens with pertinent data to the interpretation of midden data. Shell middens may be distinguished from natural shell beds as follows (Attenbrow 1992; Bailey 1975, 1994; Gill 1951; Coutts 1966; Hughes and Sullivan 1974);

- 1) Middens contain charcoal, burnt wood, clay and/or earth, blackened shells, some artefacts, hearth stones. These are absent from natural shell beds.
- 2) Middens are either unstratified or roughly stratified whereas natural shell deposits are well stratified and exhibit sedimentary features of water laid deposits.
- 3) Middens contain edible species and sizes whereas shell beds contain shells of varied species and sizes as well as both edible and non-edible species.
- 4) Middens do not contain worn shell resulting from transportation from the off shore or beach zone, whereas shell beds do.
- 5) Middens contain mammal bones used in food consumption, shell beds do not.
- 6) Middens do not contain certain forms of marine life not used by Aboriginal people (e.g., corals, tube worms) but shell beds do.

Interpretation of shell middens usually falls into three main categories;

- 1) Taphonomy: differential survival value of different species may be considered.
- 2) Environmental/ecological: changes in habitat may bring about changes in the availability of species (Coutts 1970).
- 3) Economic/behavioural: changes in gathering habits brought about by some purely cultural factor may be considered (Bowdler 1970, 1976).

The interpretation of shell middens is only as good as one's analysis, which is only as good as one's sample, all of which are typically limited during surface survey only. Shell middens may represent evidence of;

- Large camp sites, where everyday activities such as habitation, maintenance of stone or wooden tools, manufacturing of such tools, management of raw materials, preparation and consumption of food and shell fish and storage of tools has occurred;
- Medium/small camp sites, where activities such as a small meal was cooked and/or consumed;
- Hunting and/or gathering events;

- Other events spatially separated from a camp site, or
- Transitory movement through the landscape.

Shell middens are a common site type in the locality and the broader region. There is potential for shell middens to occur in with the highest concentrations and highest densities located within 50 metres of the interbarrier depression. There is also the potential for such sites to be impacted on through past land uses.

- **Burials**

Burials can occur anywhere (ground, cave, and hollow tree). Cave burials usually do not survive due to both animal and human disturbances and extant tree burials are rare due to logging and land clearance. Ground burials tend to be in soft sandy soils, but can be found in soil and clay. Burials are also commonly found in association with burial goods including stone axe heads (Howitt 1996:464-465). Generally, they are only identified through accidental exposure. Although factors such as land clearance and associated erosion reduce the likelihood of burials surviving intact, bone is durable and commonly survives in such environments, albeit in fragmentary form.

It is well documented that Aboriginal burials are located throughout the dunes and in association with shell middens. The likelihood of discovering ground burials in the project area is assessed as being moderate.

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APPENDIX A

AHIMS search results

DRAFT

Penny Mccardle

Date: 01 January 2023

Po Box 166

Adamstown New South Wales 2289

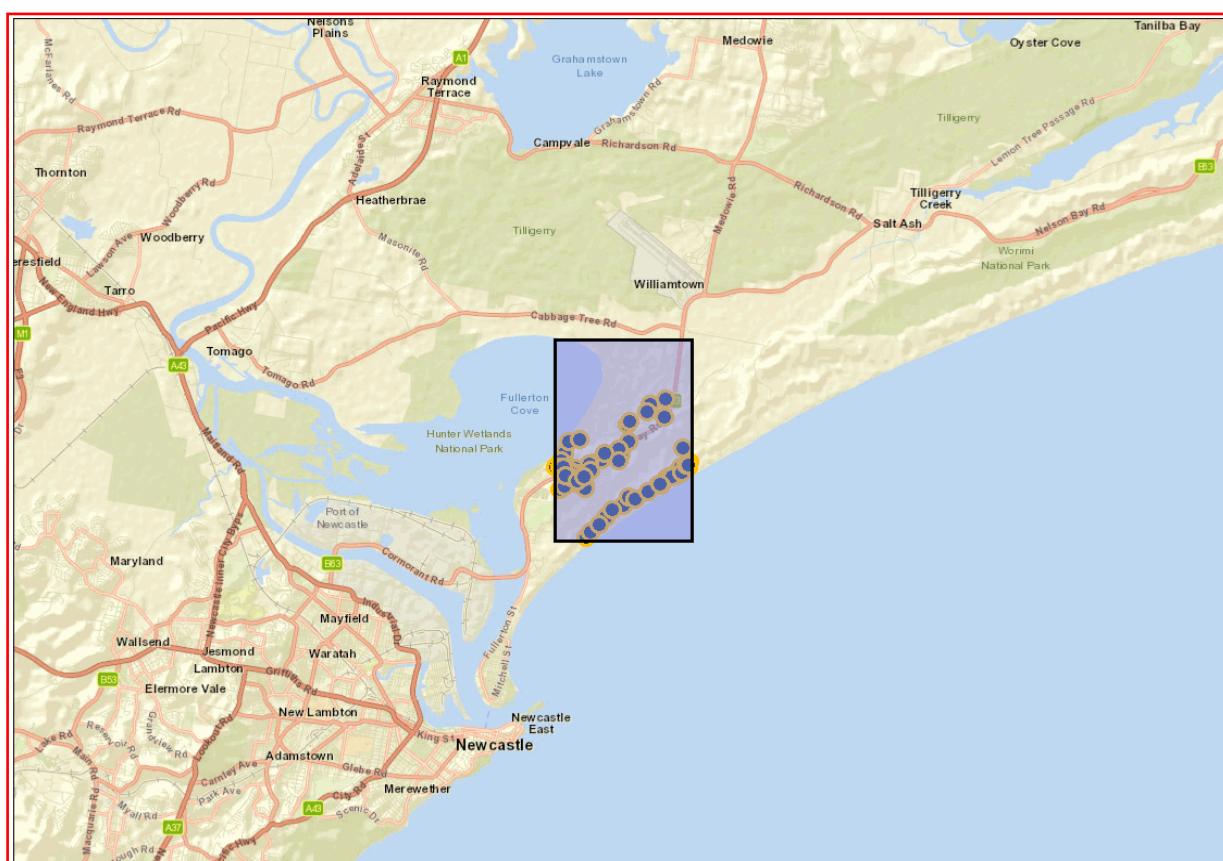
Attention: Penny Mccardle

Email: penny@mcheritage.com.au

Dear Sir or Madam:

AHIMS Web Service search for the following area at Datum :GDA, Zone : 56, Eastings : 388000.0 - 392000.0, Northings : 6362000.0 - 6368000.0 with a Buffer of 0 meters, conducted by Penny Mccardle on 01 January 2023.

The context area of your search is shown in the map below. Please note that the map does not accurately display the exact boundaries of the search as defined in the paragraph above. The map is to be used for general reference purposes only.



A search of Heritage NSW AHIMS Web Services (Aboriginal Heritage Information Management System) has shown that:

71	Aboriginal sites are recorded in or near the above location.
0	Aboriginal places have been declared in or near the above location. *

If your search shows Aboriginal sites or places what should you do?

- You must do an extensive search if AHIMS has shown that there are Aboriginal sites or places recorded in the search area.
- If you are checking AHIMS as a part of your due diligence, refer to the next steps of the Due Diligence Code of practice.
- You can get further information about Aboriginal places by looking at the gazettal notice that declared it. Aboriginal places gazetted after 2001 are available on the [NSW Government Gazette \(https://www.legislation.nsw.gov.au/gazette\)](https://www.legislation.nsw.gov.au/gazette) website. Gazettal notices published prior to 2001 can be obtained from Heritage NSW upon request

Important information about your AHIMS search

- The information derived from the AHIMS search is only to be used for the purpose for which it was requested. It is not be made available to the public.
- AHIMS records information about Aboriginal sites that have been provided to Heritage NSW and Aboriginal places that have been declared by the Minister;
- Information recorded on AHIMS may vary in its accuracy and may not be up to date. Location details are recorded as grid references and it is important to note that there may be errors or omissions in these recordings,
- Some parts of New South Wales have not been investigated in detail and there may be fewer records of Aboriginal sites in those areas. These areas may contain Aboriginal sites which are not recorded on AHIMS.
- Aboriginal objects are protected under the National Parks and Wildlife Act 1974 even if they are not recorded as a site on AHIMS.
- This search can form part of your due diligence and remains valid for 12 months.

AHIMS Web Services (AWS)

Extensive search - Site list report

Your Ref/PO Number : Fullerton Cove Strategy

Client Service ID : 742918

SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status **	SiteFeatures	SiteTypes	Reports
38-4-2142	42 Fullerton Cove Road PAD 1	GDA	56	388315	6364130	Open site	Valid	Potential Archaeological Deposit (PAD) : -		
	Contact	Recorders	Mr.Matthew Barber,NGH Heritage - Fyshwick					Permits		
38-4-0134	NBR2;	AGD	56	388450	6363700	Open site	Valid	Shell : -, Artefact : -	Midden	1269,101086
	Contact	Recorders	Margrit Koettig,Rex Silcox					Permits	2026	
38-4-0951	Fern Bay Estate 18	AGD	56	389035	6364110	Open site	Valid	Shell : 2, Artefact : 81		
	Contact T Russell	Recorders	ERM Australia Pty Ltd- Sydney CBD					Permits		
38-4-0258	Fern Hill 2;	AGD	56	389400	6362500	Open site	Valid	Artefact : -	Open Camp Site	1845
	Contact	Recorders	Pam Dean-Jones,Mr.Luke Godwin					Permits		
38-4-0948	Fern Bay Estate 15	AGD	56	389847	6364460	Open site	Valid	Artefact : 1		
	Contact T Russell	Recorders	ERM Australia Pty Ltd- Sydney CBD					Permits		
38-4-0129	NBR7;	AGD	56	389850	6364380	Open site	Valid	Artefact : -	Open Camp Site	1269,101086
	Contact	Recorders	Margrit Koettig,Rex Silcox					Permits		
38-5-0157	Fullerton Site 1;Newcastle Bight;	AGD	56	389930	6362840	Open site	Valid	Shell : -, Artefact : -	Midden,Open Camp Site	
	Contact	Recorders	Liam Dagg					Permits	845,916	
38-4-0321	Newcastle Bight 2;	AGD	56	390050	6364760	Open site	Valid	Artefact : -	Open Camp Site	2250,101086
	Contact	Recorders	Mr.Matthew Barber					Permits		
38-5-0161	Fullerton Site 5;Newcastle Bight;	AGD	56	390090	6363090	Open site	Valid	Shell : -, Artefact : -	Midden,Open Camp Site	
	Contact	Recorders	Liam Dagg					Permits	916	
38-5-0158	Fullerton Site 2;Newcastle Bight;	AGD	56	390260	6363040	Open site	Valid	Shell : -, Artefact : -	Midden,Open Camp Site	
	Contact	Recorders	Liam Dagg,Liam Dagg					Permits	845,916	
38-4-1035	Fullerton Cove Extraction 1	AGD	56	391149	6366046	Open site	Valid	Artefact : 100		
	Contact Searle	Recorders	Ms.Penny Mccardle					Permits	3033	
38-4-0262	Fern Bay_6;	AGD	56	391500	6363900	Open site	Valid	Shell : -, Artefact : -	Midden	1845
	Contact	Recorders	Pam Dean-Jones,Mr.Luke Godwin,M Heath					Permits		
38-4-0359	Site 1	AGD	56	388050	6363290	Open site	Valid	Shell : -, Artefact : -	Midden	101086
	Contact	Recorders	Noeleen Curran					Permits		
38-4-0334	Fullerton Cove Road 2;	AGD	56	388150	6364390	Open site	Valid	Shell : -, Artefact : -	Midden	2604
	Contact	Recorders	S Davies,Davies Heritage Consultants Pty Ltd					Permits	4398	
38-4-0128	NBR8;	AGD	56	388300	6364750	Open site	Valid	Shell : -, Artefact : -	Midden	1269,101086
	Contact	Recorders	Margrit Koettig,Rex Silcox					Permits	2026	
38-4-0790	Fern Bay Estate Site C	AGD	56	388452	6363647	Open site	Valid	Artefact : -, Shell : -		
	Contact	Recorders	Jim Wheeler					Permits		
38-4-0130	NBR6;	AGD	56	389260	6364220	Open site	Valid	Shell : -, Artefact : -	Midden	1269,101086

Report generated by AHIMS Web Service on 01/01/2023 for Penny Mccardle for the following area at Datum :GDA, Zone : 56, Eastings : 388000.0 - 392000.0, Northings : 6362000.0 - 6368000.0 with a Buffer of 0 meters.. Number of Aboriginal sites and Aboriginal objects found is 71

This information is not guaranteed to be free from error omission. Heritage NSW and its employees disclaim liability for any act done or omission made on the information and consequences of such acts or omission.

SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status **	SiteFeatures	SiteTypes	Reports
	<u>Contact</u>	<u>Recorders</u>						<u>Permits</u>		
38-4-2011	George St 1	GDA	56	390796	6366074	Open site	Valid	Artefact : -		
	<u>Contact</u>	<u>Recorders</u>						<u>Permits</u>	4398	
38-5-0160	Fullerton Site 4;Newcastle Bight;	AGD	56	390960	6363500	Open site	Valid	Shell : -, Artefact : -	Midden,Open Camp Site	
	<u>Contact</u>	<u>Recorders</u>						<u>Permits</u>	916	
38-4-0261	Fern Bay_5;	AGD	56	391200	6363700	Open site	Valid	Shell : -, Artefact : -	Midden	1845
	<u>Contact</u>	<u>Recorders</u>						<u>Permits</u>		
38-4-1872	Worimi RVA 032	GDA	56	391356	6363899	Open site	Valid	Shell : 1		
	<u>Contact</u>	<u>Recorders</u>						<u>Permits</u>		
38-4-0644	Fullerton Site 36	AGD	56	391496	6363762	Open site	Valid	Artefact : 1		
	<u>Contact</u>	<u>Recorders</u>						<u>Permits</u>		
38-4-0263	Fern Bay_7;	AGD	56	391600	6364000	Open site	Valid	Shell : -, Artefact : -	Midden	1845
	<u>Contact</u>	<u>Recorders</u>						<u>Permits</u>		
38-4-1644	Fullerton Cove Midden 1	GDA	56	388188	6364359	Open site	Valid	Artefact : -, Shell : -		
	<u>Contact</u>	<u>Recorders</u>						<u>Permits</u>	4672,5017	
38-4-0858	8	AGD	56	388400	6363670	Open site	Valid	Shell : 100		
	<u>Contact</u> T Russell	<u>Recorders</u>						<u>Permits</u>		
38-4-0126	NBR10;	AGD	56	388500	6363950	Open site	Valid	Shell : -, Artefact : -	Midden	1269
	<u>Contact</u>	<u>Recorders</u>						<u>Permits</u>	2026	
38-4-0241	F C 1;Fullerton Cove;	AGD	56	388600	6364800	Open site	Valid	Artefact : -	Open Camp Site	1845
	<u>Contact</u>	<u>Recorders</u>						<u>Permits</u>		
38-4-0861	Fern Bay Estaet 9	AGD	56	388790	6363440	Open site	Valid	Shell : 1		
	<u>Contact</u> T Russell	<u>Recorders</u>						<u>Permits</u>		
38-4-0588	Fullerton 28	AGD	56	388842	6361884	Open site	Valid	Artefact : 1		
	<u>Contact</u>	<u>Recorders</u>						<u>Permits</u>		
38-4-0950	Fern Bay Estate 17	AGD	56	389785	6364535	Open site	Valid	Artefact : -, Shell : -		
	<u>Contact</u> T Russell	<u>Recorders</u>						<u>Permits</u>		
38-4-0340	Williamtown 1;WT-1;	AGD	56	391100	6365500	Open site	Valid	Artefact : -	Open Camp Site	
	<u>Contact</u>	<u>Recorders</u>						<u>Permits</u>		
38-4-0264	Fern Bay_8;	AGD	56	391800	6364100	Open site	Valid	Shell : -, Artefact : -	Midden	1845
	<u>Contact</u>	<u>Recorders</u>						<u>Permits</u>		
38-4-1870	Worimi RVA 030	GDA	56	391926	6364193	Open site	Valid	Shell : 1		
	<u>Contact</u>	<u>Recorders</u>						<u>Permits</u>		
38-4-1867	Worimi RVA027	GDA	56	391965	6364382	Open site	Valid	Shell : 1		
	<u>Contact</u>	<u>Recorders</u>						<u>Permits</u>		
38-4-0785	Fern Bay Site E	AGD	56	388170	6363400	Open site	Valid	Artefact : -, Shell : -		

Report generated by AHIMS Web Service on 01/01/2023 for Penny Mccardle for the following area at Datum :GDA, Zone : 56, Eastings : 388000.0 - 392000.0, Northings : 6362000.0 - 6368000.0 with a Buffer of 0 meters.. Number of Aboriginal sites and Aboriginal objects found is 71

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AHIMS Web Services (AWS)

Extensive search - Site list report

Your Ref/PO Number : Fullerton Cove Strategy

Client Service ID : 742918

SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status **	SiteFeatures	SiteTypes	Reports
	<u>Contact</u>	<u>Recorders</u>	Jim Wheeler					<u>Permits</u>	2026	
38-4-2013	AHR1	GDA	56	388583	6363699	Open site	Valid	Artefact : 1, Non-Human Bone and Organic Material : 1, Shell : 1		
	<u>Contact</u>	<u>Recorders</u>	ERM - Thornton					<u>Permits</u>		
38-4-0133	NBR3;	AGD	56	388600	6363790	Open site	Valid	Shell : -, Artefact : -	Midden	1269,101086
	<u>Contact</u>	<u>Recorders</u>	Margrit Koettig,Rex Silcox					<u>Permits</u>	2026	
38-4-0789	Fern bay Estate 11	AGD	56	388850	6363850	Open site	Valid	Artefact : -		
	<u>Contact</u>	<u>Recorders</u>	Pam Dean-Jones					<u>Permits</u>		
38-4-0127	NBR9;	AGD	56	389360	6364400	Open site	Valid	Shell : -, Artefact : -	Midden	1269,101086
	<u>Contact</u>	<u>Recorders</u>	Margrit Koettig,Rex Silcox					<u>Permits</u>		
38-4-0563	Fullerton 1	AGD	56	391352	6363717	Open site	Valid	Shell : -		
	<u>Contact</u>	<u>Recorders</u>	Umwelt (Australia) Pty Limited - Individual users					<u>Permits</u>		
38-4-1871	Worimi RVA 031	GDA	56	391731	6364059	Open site	Valid	Shell : 1		
	<u>Contact</u>	<u>Recorders</u>	Mr.Warren Mayers					<u>Permits</u>		
38-4-0333	Fullerton Cove Road;site1;	GDA	56	388010	6364171	Open site	Valid	Shell : -, Artefact : -	Midden	2604
	<u>Contact</u>	<u>Recorders</u>	S Davies,Davies Heritage Consultants Pty Ltd,Mr.Matthew Barber,NGH Heritage - F					<u>Permits</u>	4672,5017	
38-4-2140	42 Fullerton Cove Road PAD 3	GDA	56	388140	6364150	Open site	Valid	Artefact : -, Potential Archaeological Deposit (PAD) : -, Shell : -		
	<u>Contact</u>	<u>Recorders</u>	Mr.Matthew Barber,NGH Heritage - Fyshwick					<u>Permits</u>		
38-4-0859	Fern Bay Site E	AGD	56	388170	6363400	Open site	Valid	Shell : 400		
	<u>Contact</u> T Russell	<u>Recorders</u>	Jim Wheeler					<u>Permits</u>		
38-4-0542	Site 2	AGD	56	388290	6363790	Open site	Valid	Shell : -, Artefact : -		2958,101086
	<u>Contact</u>	<u>Recorders</u>	Noeleen Curran					<u>Permits</u>	2026	
38-4-0953	Fern Bay Estate 6	AGD	56	388370	6363836	Open site	Valid	Artefact : -		
	<u>Contact</u> T Russell	<u>Recorders</u>	Pam Dean-Jones					<u>Permits</u>		
38-4-0135	NBR1;	AGD	56	388390	6363780	Open site	Valid	Shell : -, Artefact : -	Midden	1269,101086,1 02218
	<u>Contact</u>	<u>Recorders</u>	Margrit Koettig,Rex Silcox					<u>Permits</u>	2026	
38-4-0786	Fern Bay Estate 7	AGD	56	388400	6363670	Open site	Valid	Artefact : -, Shell : -		
	<u>Contact</u>	<u>Recorders</u>	Jim Wheeler					<u>Permits</u>	2026	
38-4-0791	Fern Bay Estate 8	AGD	56	388750	6363700	Open site	Valid	Artefact : -, Shell : -		
	<u>Contact</u>	<u>Recorders</u>	Pam Dean-Jones					<u>Permits</u>		
38-4-0131	NBR5;	AGD	56	388920	6364080	Open site	Valid	Artefact : -	Open Camp Site	1269
	<u>Contact</u>	<u>Recorders</u>	Margrit Koettig,Rex Silcox					<u>Permits</u>		

Report generated by AHIMS Web Service on 01/01/2023 for Penny Mccardle for the following area at Datum :GDA, Zone : 56, Eastings : 388000.0 - 392000.0, Northings : 6362000.0 - 6368000.0 with a Buffer of 0 meters.. Number of Aboriginal sites and Aboriginal objects found is 71

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SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status **	SiteFeatures	SiteTypes	Reports
38-4-0589	Fullerton 29	AGD	56	388977	6362047	Open site	Valid	Shell : 1		
	<u>Contact</u>	<u>Recorders</u>				Umwelt (Australia) Pty Limited - Individual users		<u>Permits</u>		
38-4-0949	Fern Bay Estate 16	AGD	56	389772	6364185	Open site	Valid	Artefact : 4		
	<u>Contact</u> T Russell	<u>Recorders</u>				ERM Australia Pty Ltd- Sydney CBD		<u>Permits</u>		
38-4-1868	Worimi RVA 028	GDA	56	391971	6364367	Open site	Valid	Shell : 1		
	<u>Contact</u>	<u>Recorders</u>				Mr.Warren Mayers		<u>Permits</u>		
38-4-2141	42 Fullerton Cove Road PAD 2	GDA	56	388250	6364160	Open site	Valid	Potential Archaeological Deposit (PAD) : -, Shell : -		
	<u>Contact</u>	<u>Recorders</u>				Mr.Matthew Barber,NGH Heritage - Fyshwick		<u>Permits</u>		
38-4-0787	Fern Bay Estate 9	AGD	56	388790	6363344	Open site	Valid	Artefact : -		
	<u>Contact</u>	<u>Recorders</u>				Jim Wheeler		<u>Permits</u>	2026	
38-4-0788	Fern Bay Estate 10	AGD	56	388950	6363900	Open site	Valid	Shell : -		
	<u>Contact</u>	<u>Recorders</u>				Pam Dean-Jones		<u>Permits</u>	2355	
38-4-0259	Fern Hill 3;	AGD	56	389600	6362700	Open site	Valid	Shell : -, Artefact : -	Midden	1845
	<u>Contact</u>	<u>Recorders</u>				Mr.Luke Godwin		<u>Permits</u>		
38-5-0159	Fullerton Site 3;Newcastle Bight;	AGD	56	390640	6363260	Open site	Valid	Shell : -, Artefact : -	Midden,Open Camp Site	
	<u>Contact</u>	<u>Recorders</u>				Liam Dagg,Liam Dagg		<u>Permits</u>	845,916	
38-4-1869	Worimi RVA 029	GDA	56	391857	6364253	Open site	Valid	Shell : 1		
	<u>Contact</u>	<u>Recorders</u>				Mr.Warren Mayers		<u>Permits</u>		
38-4-0857	Fern Bay Estate 5	AGD	56	388220	6363736	Open site	Valid	Artefact : 2		
	<u>Contact</u> T Russell	<u>Recorders</u>				Jim Wheeler		<u>Permits</u>		
38-4-0860	FERN Bay Site F	AGD	56	388560	6363570	Open site	Valid	Stone Quarry : 100		
	<u>Contact</u> T Russell	<u>Recorders</u>				Jim Wheeler		<u>Permits</u>		
38-4-0784	Fern Bay Site D	AGD	56	388560	6363570	Open site	Valid	Artefact : -		
	<u>Contact</u>	<u>Recorders</u>				Jim Wheeler		<u>Permits</u>	2026	
38-4-0132	NBR4;	AGD	56	388740	6363680	Open site	Valid	Artefact : -	Open Camp Site	1269,101086
	<u>Contact</u>	<u>Recorders</u>				Margrit Koettig,Rex Silcox		<u>Permits</u>	2026,2355	
38-4-2047	Fullerton Cove - IF1	GDA	56	390114	6365473	Open site	Valid	Artefact : -		
	<u>Contact</u>	<u>Recorders</u>				Eco Logical Australia Pty Ltd - Sydney - Individual users,Mr.Tyler Beebe		<u>Permits</u>		
38-4-1645	Fullerton Cove Midden 2	GDA	56	390179	6365560	Open site	Valid	Artefact : -, Shell : -		
	<u>Contact</u>	<u>Recorders</u>				Ms.Erin Mein		<u>Permits</u>	4398	
38-5-0162	Fullerton Site 6;Newcastle Bight;	AGD	56	391040	6363460	Open site	Valid	Shell : -, Artefact : -	Midden	
	<u>Contact</u>	<u>Recorders</u>				Liam Dagg		<u>Permits</u>	916	
38-4-0322	Newcastle Bight 1;	AGD	56	391670	6364600	Open site	Valid	Shell : -, Artefact : -	Midden	2250

AHIMS Web Services (AWS)

Extensive search - Site list report

Your Ref/PO Number : Fullerton Cove Strategy

Client Service ID : 742918

<u>SiteID</u>	<u>SiteName</u>	<u>Datum</u>	<u>Zone</u>	<u>Easting</u>	<u>Northing</u>	<u>Context</u>	<u>Site Status **</u>	<u>SiteFeatures</u>	<u>SiteTypes</u>	<u>Reports</u>
	<u>Contact</u>	<u>Recorders</u>								
38-4-0564	Fullerton 3	AGD	56	391828	6364079	Open site	Valid	Shell : 1		
	<u>Contact</u>	<u>Recorders</u>								
38-4-0590	Fullerton 30	AGD	56	389216	6362255	Open site	Valid	Artefact : 3		
	<u>Contact</u>	<u>Recorders</u>								
38-4-0706	FC 1	AGD	56	390580	6365650	Open site	Valid	Artefact : 9		
	<u>Contact</u>	<u>Recorders</u>								
38-4-0260	Fern Bay_4;	AGD	56	391000	6363500	Open site	Valid	Artefact : -	Open Camp Site	1845
	<u>Contact</u>	<u>Recorders</u>								

** Site Status

Valid - The site has been recorded and accepted onto the system as valid

Destroyed - The site has been completely impacted or harmed usually as consequence of permit activity but sometimes also after natural events. There is nothing left of the site on the ground but proponents should proceed with caution.

Partially Destroyed - The site has been only partially impacted or harmed usually as consequence of permit activity but sometimes also after natural events. There might be parts or sections of the original site still present on the ground

Not a site - The site has been originally entered and accepted onto AHIMS as a valid site but after further investigations it was decided it is NOT an aboriginal site. Impact of this type of site does not require permit but Heritage NSW should be notified

Report generated by AHIMS Web Service on 01/01/2023 for Penny Mccardle for the following area at Datum :GDA, Zone : 56, Eastings : 388000.0 - 392000.0, Northings : 6362000.0 - 6368000.0 with a Buffer of 0 meters.. Number of Aboriginal sites and Aboriginal objects found is 71

This information is not guaranteed to be free from error omission. Heritage NSW and its employees disclaim liability for any act done or omission made on the information and consequences of such acts or omission.

Appendix B

- **Aboriginal Community Comments**

Consultation Log

Note: Only the active calls, emails and messages are included. Contact trying to firm up meeting not included. Difficulty in getting everyone together at the same time. Particularly due to terrible weather.

date	To / From	Purpose	Comment
11/02/25	To Registered Stakeholders	Notify process of ACHAMP preparation and requesting EOI	Response by 5pm 25/2/2024
(By) 25/02/25	From 3 stakeholders	Responding to initial email and indicating interest in project	WLALC, Murrooma, Nurungee
25/02/25	To the 3 stakeholders	Seeking meeting time. Venue to be at Murrook	Meeting to discuss project
07/05/25	To the 3 stakeholders	Information for meeting and draft conditions etc.	All responded happy with report and conditions.
12/05/25	From WLALC CEO	Confirming meeting for 16/5	
15/05/25	From WLALC CEO)	Postponing meeting due to extreme weather and flooding	All agreed
3/6/25	Stakeholders	Meeting to discuss the project and Aboriginal Community input into the process	Minutes of meeting attached

On 27 May 2025, at 3:26 pm, Andrew Smith <andrew@worimi.org.au> wrote:

To MCAS

Attention: Mr Len Roberts

I write to confirm receipt of the Fullerton Cove Place Study and note the Worimi LALC's continued interest and engagement, following the works already completed by MCH and MCAS (i.e. the draft ACHMP).

The Worimi LALC; in partnership with key Registered Aboriginal Parties i.e. Nur-Run-Gee Pty Ltd, Murrooma Inc and Karuah Aboriginal Corp continue to be the recognised stakeholder groups that have consulted on the study area and we welcome the opportunity to continue being consulted and actively engaged as Aboriginal heritage managers, as outlined in the draft ACHMP.

Appreciating the attempts to meet; we look forward to touching base with you on the 3rd June at 2:30pm, following which, the MINUTES of the meeting/consult are to be added to the ACHMP.

Please contact me; should you require anything further, prior to meeting on the 3rd.

Warm Regards,

Andrew Smith | Chief Executive Officer

Worimi Local Aboriginal Land Council

Street: 2163 Nelson Bay Rd, Williamtown NSW 2318

Postal: PO Box 56, Tanilba Bay NSW 2319

Ph | 02 4033 8800



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Minutes of Aboriginal Consultation Meeting For the Fullerton Cove Place Study Project

Meeting at Murrook Cultural Centre, Williamstown 3/6/2025 at 2.30pm

Attendance: CEO Andrew Smith WLALC, sites officers Jamie Merrick and David Kirk, Len Roberts Archaeologist.

Apologies,

Len Anderson (illness) Bec Young (work Commitments. Andrew had advised he had been in contact with the others and as per previous emails were happy with the process and endorsed the report's recommendations.

Len R. outlined the proposal area and the existing Aboriginal cultural heritage management plan over the sand quarry site and also showed how many surveys were taken within the area.

Len also showed where the known objects were and how that many of them had been salvaged or subject to an AHIP.

Andrew raised a question of the boundaries and whether or not the PFAS area was involved.

Len responded that to his knowledge the boundary was determined because it was outside the PFAS area.

Len outlined the purpose of the ACHMP.

The group liked the idea of the establishment of an Aboriginal reference group for the duration of The Project and particularly liked the idea of having to undertake a walk over before any earthworks were taken on any land not subject to the existing ACHMP.

The group felt that was a good idea that that the ACHMP be extended to the other land and that it was important that prior to earth works on any of the other land that a survey must be undertaken.

Discussion ensued regarding the induction of the workers and Len went through the proposed program for induction of the workers.

The site workers acknowledge that it was a good thing and Len advised that they could use that particular program for any of the inductions elsewhere that they were involved with.

Andrew mentioned that they had a partnership with the University of Sydney with respect and establishment of artefact analysis of items repatriated from Broughton Island.

Len was shown the facility as it was a wonderful facility and in discussion with Andrew it was thought it would be a good idea if any artifacts collected from the project area go to that facility for analysis and an appropriately displayed or placed in a keeping place.

The other stakeholders have previously expressed their support of this process and although they couldn't attend because of illness and work commitments Andrew agreed to circulate the

thoughts of this meeting to the others. He stated that that they were really looking forward to being part of this project to the establishment and operation of the ACHMP.

It was agreed that the Aboriginal reference group needed to be established and the membership would consist of representatives of the land council and the other two stakeholder groups.

Dave suggested that this is not just about the tangible Heritage but we need to think outside the box and we need to look at what can be done in terms of landscaping, gardening and looking at the landscape as a whole. We need to ensure that Aboriginal understanding was woven into the entire project.

The meeting agreed this was a good approach and that it is important that the ARG be established as soon as possible.

Meeting Closed 3.30pm

len@myallcoast.net.au

From: Anthony Anderson <murroomainc1@gmail.com>
Sent: Tuesday, 27 May 2025 3:16 PM
To: len@myallcoast.net.au
Subject: Re: FW: Fullerton Cove Place study

Hi Len
I'm away again however Dad is on the board so I'll
Speak with him after
Thanks Bec

On Tuesday, 27 May 2025, <len@myallcoast.net.au> wrote:

Hi All,

Just confirming nest Tuesday 3rd June 2pm for a meeting at Murrook before the board meeting at which I will also be presenting.

Could you please confirm your attendance.

Much Thanks,

Len

From: Andrew Smith <andrew@worimi.org.au>
Sent: Friday, 16 May 2025 2:35 PM
To: Len Roberts <len@myallcoast.net.au>
Cc: Jamie Merrick <jamie.merrick@worimi.org.au>; 'Anthony Anderson' <murroomainc1@gmail.com>; lennie.anderson011@bigpond.com
Subject: RE: FW: Fullerton Cove Place study

Good Afternoon All,

Thanks Len (Anderson) for the email notice and we hope everyone and everything is OK?

Jamie Merrick and I were just chatting and noted 'how it's important for everyone to be present?'... AND;

- It's Friday,
- It's late and
- It's wet... and to be honest, we'd just be happy to go home early and welcome in the weekend?

Therefore... we'd like to propose we postpone to a **NEW MEETING DATE for next Tuesday 20th @ 2:30pm.**

NOTE: Len Roberts will be onsite next Tuesday afternoon (regardless); to provide the Fullerton Cove 'Place Study' to the WLALC Board Members and it seems pointless to cause him two trips in such a short time, especially if NOT everyone can make it this afternoon.

If you could please let us know ASAP; that would be greatly appreciated.

Warmest Regards,

Andrew Smith | Chief Executive Officer

Worimi Local Aboriginal Land Council

Street: [2163 Nelson Bay Rd, Williamtown NSW](#) 2318

Postal: PO Box 56, Tanilba Bay NSW 2319

Ph | 02 4033 8800



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PLEASE CONSIDER THE ENVIRONMENT BEFORE PRINTING THIS EMAIL

--

Bec Young
Murrooma Operations Manager
0421078695

From: Andrew Smith <andrew@worimi.org.au>
Sent: Friday, 16 May 2025 2:35 PM
To: Len Roberts
Cc: Jamie Merrick; 'Anthony Anderson'; lennie.anderson011@bigpond.com
Subject: RE: FW: Fullerton Cove Place study

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- It's Friday,
- It's late and
- It's wet... and to be honest, we'd just be happy to go home early and welcome in the weekend?

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PLEASE CONSIDER THE ENVIRONMENT BEFORE PRINTING THIS EMAIL

len@myallcoast.net.au

From: lennie.anderson011@bigpond.com
Sent: Friday, 16 May 2025 1:48 PM
To: Andrew Smith; Len Roberts
Cc: jamie.merrick@worimi.org.au; 'Anthony Anderson'
Subject: RE: FW: Fullerton Cove Place study

Hi Everyone,
I've just been called away! And I'm leaving immediately. So I must apologise as I won't be able to make this afternoon's meeting. If Bec attends she can speak on my behalf!

Regards

Lennie Anderson

NUR-RUN-GEE Pty Ltd (Director)

On ,Mon May 12 2025 14:42:52 GMT+1000 (Australian Eastern Standard Time), Len Roberts <len@myallcoast.net.au> wrote:

----- Original Message -----

Yes Friday 4.30 is good let's book it in

Get BlueMail for Android

On 12 May 2025, at 12:56 pm, Andrew Smith <andrew@worimi.org.au> wrote:

Oh bless...

Please forgive me and my calendar?... I'm not back in the office until Friday.

So terribly sorry however; happy to **meet Friday afternoon (or earlier) at a time that suits – 4.30pm is still good.**

Please forgive my oversight; as I know this is important re: timing etc.

Warm Regards

Andrew Smith | Chief Executive Officer

Worimi Local Aboriginal Land Council

Street: 2163 Nelson Bay Rd, Williamtown NSW 2318

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PLEASE CONSIDER THE ENVIRONMENT BEFORE PRINTING THIS EMAIL

From: len@myallcoast.net.au <len@myallcoast.net.au>
Sent: Monday, 12 May 2025 11:24 AM
To: Andrew Smith <andrew@worimi.org.au>
Cc: Jamie Merrick <jamie.merrick@worimi.org.au>; lennie.anderson011@bigpond.com; 'Anthony Anderson' <murroomainc1@gmail.com>
Subject: RE: FW: Fullerton Cove Place study

Thanks Andrew, Thursday 4.30 pm would be great. I am happy for the board members and others to be present or even zoomed if you feel that is appropriate. What we are doing is considered to be the way of the future so if we can make this work it will be great for future assessments of major projects.

All the best Len

From: Andrew Smith <andrew@worimi.org.au>
Sent: Monday, 12 May 2025 10:31 AM
To: len@myallcoast.net.au
Cc: Jamie Merrick <jamie.merrick@worimi.org.au>; lennie.anderson011@bigpond.com;
'Anthony Anderson' <murroomainc1@gmail.com>
Subject: RE: FW: Fullerton Cove Place study

Hi Len,

Sorry that it's been so hard to get everyone together on the same date/time?

I can do this Thursday or Friday and appreciate that time is not getting away from us...

Let me know which day and; happy to do late afternoon (say 4:30pm or 5pm so everyone can attend?).

Mr. Jamie Merrick is included and he will notify the other Cultural site auditors... might be that we also present for Board members as well, given the significance of the 'Place Study' being considered?... this one is quite big.

Hear back from you shortly.

Warm Regards,

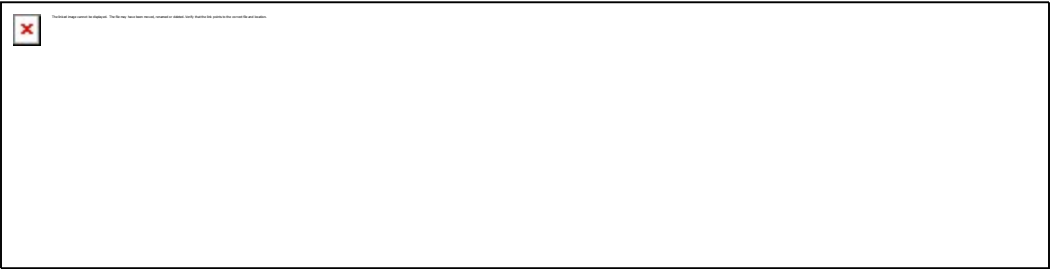
Andrew Smith | Chief Executive Officer

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PLEASE CONSIDER THE ENVIRONMENT BEFORE PRINTING THIS

From: len@myallcoast.net.au <len@myallcoast.net.au>
Sent: Friday, 2 May 2025 3:46 PM
To: lennie.anderson011@bigpond.com; Andrew Smith <andrew@worimi.org.au>
Cc: Jamie Merrick <jamie.merrick@worimi.org.au>; 'Anthony Anderson' <murroomainc1@gmail.com>
Subject: RE: FW: Fullerton Cove Place study

How does wed, thurs or Fri suit after 4pm at Murrook ?

From: lennie.anderson011@bigpond.com <lennie.anderson011@bigpond.com>
Sent: Friday, 2 May 2025 3:25 PM
To: 'Andrew Smith' <andrew@worimi.org.au>; len@myallcoast.net.au
Cc: 'Jamie Merrick' <jamie.merrick@worimi.org.au>; 'Anthony Anderson' <murroomainc1@gmail.com>
Subject: RE: FW: Fullerton Cove Place study

Hi Everyone,

I have a meeting,

Monday 8 to 1500 Environment Minister

Tuesday 7 to 1300-Then 1400-1800.NCC, then Water NSW.

Wednesday 12 Noon to 1600 Murrook. Off Shore

Thursday and Friday WCL 08.30 to 1600.

Regards

Lennie Anderson

On ,Fri May 02 2025 10:11:32 GMT+1000 (Australian Eastern Standard Time), <len@myallcoast.net.au> wrote:

----- Original Message -----

Hi all,

Can we lock in a meeting m next week re Fullerton cove please. Please let me know your availability and meeting at Murrook would be good.

Much thanks Len

From:

Andrew Smith <andrew@worimi.org.au>

Sent: Wednesday, 26 February 2025 5:43 PM

To: len@myallcoast.net.au

Cc: 'Lennie Anderson' <lennie.anderson011@bigpond.com>; Jamie Merrick <jamie.merrick@worimi.org.au>; 'Anthony Anderson' <murroomainc1@gmail.com>

Subject: RE: FW: Fullerton Cove Place study

Hi All,

Thanks Len,

That should be fine although.. not sure about others availability for this week, as my calendar is pretty full tomorrow and Friday...

Can def meet at thought Murrook no problems... but may have to be early next week?

How is everyone else suited?

Warm Regards,

Andrew Smith |

Chief Executive Officer

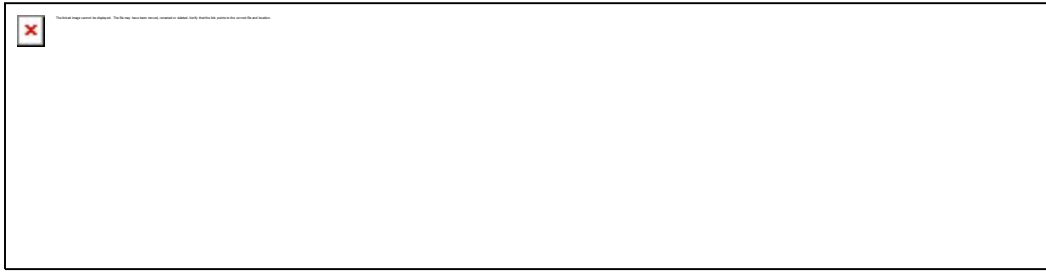
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PLEASE CONSIDER THE ENVIRONMENT BEFORE PRINTING THIS

From:

len@myallcoast.net.au <len@myallcoast.net.au>

Sent: Tuesday, 25 February 2025 1:35 PM

To: Andrew Smith <andrew@worimi.org.au>

Cc: 'Lennie Anderson' <lennie.anderson011@bigpond.com>; Jamie Merrick
<jamie.merrick@worimi.org.au>; 'Anthony Anderson' <murroomainc1@gmail.com>

Subject: RE: FW: Fullerton Cove Place study

Hi Andrew,

Brilliant, How about this week at Murook ASAP. No others registered except Dave Feeney. Andrew can we meet at Murook please. Call me on 0403071922. All the best Len

From:

Andrew Smith <andrew@worimi.org.au>

Sent: Tuesday, 25 February 2025 9:11 AM

To: len@myallcoast.net.au

Cc: Lennie Anderson <lennie.anderson011@bigpond.com>; Jamie Merrick <jamie.merrick@worimi.org.au>; Anthony Anderson <murroomainc1@gmail.com>

Subject: RE: FW: Fullerton Cove Place study

Thanks Bec,

Hi Len,

Hope your well.

We echo Bec's concerns and have been working closely with the RAP's for quite some time.

This has it's benefits and strengths; in an environment where every 'Tom, Dick and Harry' think that they are cultural guru's and can register EVERYWHERE?

We support a joint and unified meeting to discuss the CHMP,

previous actions and an appropriate way to move forward.

Look forward to hearing back from you shortly.

Warmest Regards,

Andrew Smith |

Chief Executive Officer

Worimi Local Aboriginal Land Council

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PLEASE CONSIDER THE ENVIRONMENT BEFORE PRINTING THIS

From:

Anthony Anderson <murroomainc1@gmail.com>

Sent: Wednesday, 19 February 2025 2:40 PM

To: len@myallcoast.net.au

Cc: Lennie Anderson <lennie.anderson011@bigpond.com>; Jamie Merrick <jamie.merrick@worimi.org.au>; Andrew Smith <andrew@worimi.org.au>

Subject: Re: FW: Fullerton Cove Place study

Hi Len,

Thanks for sending through-

Just a question from a TO perspective-

Why is the LALC to be the lead stakeholder over the CHMP and make decisions on behalf of the Traditional Owners? Within the Worimi community we are completely unified and work together (specific knowledge holders/RAP groups) on all protection of country including development of CHMP's (sit down and yarn as groups).

This area has had previous surveys completed however not all lands (private property owners) have been surveyed esp the sand quarry recently. The owner of the sand quarry did not uphold the original CHMP so a lot of the information outlined is not correct including the loss of the artefacts that were collected.

There are also sites around and within this area that are not recorded on AHIMS either- Most sites recorded on AHMIS are there because of destruction/projects previously.

It would be great to call a meeting with the LALC and Knowledge Holder RAP's in regards to this CHMP to discuss previous actions and movement forward eg- onsite monitoring of all excavation works due to the sensitivity of the area:

The Worimi oral history of travel routes and campsites are connected to this area and are based around this dune system seen within the project area of Fullerton Cove. "The Fingers" of sand dunes ran from Stockton Beach to the Hunter River and are a direct connection to our traditional storylines. This dune still exists on this property, although in some areas this is seriously disturbed however our heritage is still evident.

This is our usual process for creating CHMP's including previous works within the local area (Seaside Village).

Thanks Bec Young

On Wed, Feb 12, 2025 at 8:20 AM <len@myallcoast.net.au> wrote:

Hi Anthony, I inadvertently left you off the list. My apologies. All the best
Len

From: len@myallcoast.net.au <len@myallcoast.net.au>
Sent: Tuesday, 11 February 2025 8:34 PM
To: 'andrew@worimi.org.au' <andrew@worimi.org.au>
Cc: 'indigenousskaruah@outlook.com' <indigenousskaruah@outlook.com>;
'lennie.anderson011@bigpond.com' <lennie.anderson011@bigpond.com>;
'daveyhorton69@gmail.com' <daveyhorton69@gmail.com>;
'Widescope.group@live.com' <Widescope.group@live.com>
Subject: Fullerton Cove Place study

Hi All,

I am writing to you as registered stakeholders for the Fullerton Cove Place Project. The initial study was undertaken by Penny McCardle (MCH). The department of planning and Council have progressed the matter and asked the proponent to undertake a heritage management plan. An ACHMP is required as there are known objects within and adjacent to the study area as well as an existing ACHMP over the Sand Quarry land.

The ACHMP has specific roles for the Aboriginal Community, however the lead Stakeholder will be WLALC to have carriage of the ACHMP. However, as you are registered it is necessary to send the document to all stakeholders.

Please submit your comments by 5pm 25/2/2024.

If you have questions or would like to chat you can call me on 0403071922.

All the best,

Len Roberts

MCAS

--

Bec Young

Murrooma Operations Manager

0421078695

From: Anthony Anderson <murroomainc1@gmail.com>
Sent: Thursday, 15 May 2025 2:59 PM
To: Len Roberts
Subject: Re: FW: Fullerton Cove Place study

Hi Len

Apologies but I'm out in the field tomorrow and 4:30 won't work for me - however lock Andrew and uncle Len in and go from there.

I'll catch up with what's happening and will write an email to cover Murrooma's agreement in having the management group in place in order for best practice over this particular area of country.

Thanks Bec

On Thursday, 15 May 2025, Len Roberts <len@myallcoast.net.au> wrote:

Hi Andrew, Lenny and Bec,

Just confirming tomorrow 4.30. Will the board be in attendance? Do you have a connection to a big screen for a pp presentation or will it need to print copies. All the best Len

Get BlueMail for Android

On 12 May 2025, at 11:03 am, Andrew Smith <andrew@worimi.org.au> wrote:

Hi Len,

Sorry that it's been so hard to get everyone together on the same date/time?

I can do this Thursday or Friday and appreciate that time is not getting away from us...

Let me know which day and; happy to do late afternoon (say 4:30pm or 5pm so everyone can attend?).

Mr. Jamie Merrick is included and he will notify the other Cultural site auditors... might be that we also present for Board members as well, given the significance of the 'Place Study' being considered?... this one is quite big.

Hear back from you shortly.

Warm Regards,

Andrew Smith | Chief Executive Officer

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Sent: Friday, 2 May 2025 3:46 PM

To: lennie.anderson011@bigpond.com; Andrew Smith <andrew@worimi.org.au>

Cc: Jamie Merrick <jamie.merrick@worimi.org.au>; 'Anthony Anderson' <murroomainc1@gmail.com>

Subject: RE: FW: Fullerton Cove Place study

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From: lennie.anderson011@bigpond.com <lennie.anderson011@bigpond.com>

Sent: Friday, 2 May 2025 3:25 PM

To: 'Andrew Smith' <andrew@worimi.org.au>; len@myallcoast.net.au

Cc: 'Jamie Merrick' <jamie.merrick@worimi.org.au>; 'Anthony Anderson' <murroomainc1@gmail.com>

Subject: RE: FW: Fullerton Cove Place study

Hi Everyone,

I have a meeting,

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Tuesday 7 to 1300-Then 1400-1800.NCC, then Water NSW.

Wednesday 12 Noon to 1600 Murrook. Off Shore

Thursday and Friday WCL 08.30 to 1600.

Regards

Lennie Anderson

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<len@myallcoast.net.au> wrote:

----- Original Message -----

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Much thanks Len

From:

Andrew Smith <andrew@worimi.org.au>

Sent: Wednesday, 26 February 2025 5:43 PM

To: len@myallcoast.net.au

Cc: 'Lennie Anderson' <lennie.anderson011@bigpond.com>; Jamie Merrick <jamie.merrick@worimi.org.au>; 'Anthony Anderson' <murroomainc1@gmail.com>

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Chief Executive Officer

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Street: [2163 Nelson Bay Rd, Williamtown NSW](#) 2318

Postal: PO Box 56, Tanilba Bay NSW 2319

Ph | 02 4033 8800

SHARING TOGETHER / WORKING TOGETHER / SUCCEEDING TOGETHER - WORIMI
BARRAY

I respectfully acknowledge the Original Custodians of the land on which we work and play - **the Worimi**.

The Ancestors whose footprints we walk in, the Elders whose Knowledge guides us and our future leaders.

This email is intended for the person/s named and may contain confidential and/or privileged information.

If you are not the intended recipient, please notify me immediately and delete this email.

PLEASE CONSIDER THE ENVIRONMENT BEFORE PRINTING THIS

From:

len@myallcoast.net.au <len@myallcoast.net.au>

Sent: Tuesday, 25 February 2025 1:35 PM

To: Andrew Smith <andrew@worimi.org.au>

Cc: 'Lennie Anderson' <lennie.anderson011@bigpond.com>; Jamie Merrick
<jamie.merrick@worimi.org.au>; 'Anthony Anderson' <murroomainc1@gmail.com>

Subject: RE: FW: Fullerton Cove Place study

Hi Andrew,

Briliiant, How about this week at Murook ASAP. No others registered except Dave Feeney. Andrew can we meet at Murook please. Call me on 0403071922. All the best
Len

From:

Andrew Smith <andrew@worimi.org.au>

Sent: Tuesday, 25 February 2025 9:11 AM

To: len@myallcoast.net.au

Cc: Lennie Anderson <lennie.anderson011@bigpond.com>; Jamie Merrick <jamie.merrick@worimi.org.au>; Anthony Anderson <murroomainc1@gmail.com>

Subject: RE: FW: Fullerton Cove Place study

Thanks Bec,

Hi Len,

Hope your well.

We echo Bec's concerns and have been working closely with the RAP's for quite some time.

This has it's benefits and strengths; in an environment where every 'Tom, Dick and Harry' think that they are cultural guru's and can register EVERYWHERE?

We support a joint and unified meeting to discuss the CHMP,
previous actions and an appropriate way to move forward.

Look forward to hearing back from you shortly.

Warmest Regards,

Andrew Smith |

Chief Executive Officer

Worimi Local Aboriginal Land Council

Street: [2163 Nelson Bay Rd, Williamtown NSW](#) 2318

Postal: PO Box 56, Tanilba Bay NSW 2319

Ph | 02 4033 8800

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PLEASE CONSIDER THE ENVIRONMENT BEFORE PRINTING THIS

From:

Anthony Anderson <murroomainc1@gmail.com>

Sent: Wednesday, 19 February 2025 2:40 PM

To: len@myallcoast.net.au

Cc: Lennie Anderson <lennie.anderson011@bigpond.com>; Jamie Merrick <jamie.merrick@worimi.org.au>; Andrew Smith <andrew@worimi.org.au>

Subject: Re: FW: Fullerton Cove Place study

Hi Len,

Thanks for sending through-

Just a question from a TO perspective-

Why is the LALC to be the lead stakeholder over the CHMP and make decisions on behalf of the Traditional Owners? Within the Worimi community we are completely unified and work together (specific knowledge holders/RAP groups) on all protection of country including development of CHMP's (sit down and yarn as groups).

This area has had previous surveys completed however not all lands (private property owners) have been surveyed esp the sand quarry recently. The owner of the sand quarry did not uphold the original CHMP so a lot of the information outlined is not correct including the loss of the artefacts that were collected.

There are also sites around and within this area that are not recorded on AHIMS either- Most sites recorded on AHMIS are there because of destruction/projects previously.

It would be great to call a meeting with the LALC and Knowledge Holder RAP's in regards to this CHMP to discuss previous actions and movement forward eg- onsite monitoring of all excavation works due to the sensitivity of the area:

The Worimi oral history of travel routes and campsites are connected to this area and are based around this dune system seen within the project area of Fullerton Cove. "The Fingers" of sand dunes ran from Stockton Beach to the Hunter River and are a direct connection to our traditional storylines. This dune still exists on this property, although in some areas this is seriously disturbed however our heritage is still evident.

This is our usual process for creating CHMP's including previous works within the local area (Seaside Village).

Thanks Bec Young

On Wed, Feb 12, 2025 at 8:20 AM <len@myallcoast.net.au> wrote:

Hi Anthony, I inadvertently left you off the list. My apologies. All the best Len

From: len@myallcoast.net.au <len@myallcoast.net.au>

Sent: Tuesday, 11 February 2025 8:34 PM

To: 'andrew@worimi.org.au' <andrew@worimi.org.au>

Cc: 'indigenousskaruah@outlook.com' <indigenousskaruah@outlook.com>;

'lennie.anderson011@bigpond.com' <lennie.anderson011@bigpond.com>;

'daveyhorton69@gmail.com' <daveyhorton69@gmail.com>; 'Widescope.group@live.com' <Widescope.group@live.com>

Subject: Fullerton Cove Place study

Hi All,

I am writing to you as registered stakeholders for the Fullerton Cove Place Project. The initial study was undertaken by Penny McCardle (MCH). The department of planning and Council have progressed the matter and asked the proponent to undertake a heritage management plan. An ACHMP is required as there are known objects within and adjacent to the study area as well as an existing ACHMP over the Sand Quarry land.

The ACHMP has specific roles for the Aboriginal Community, however the lead Stakeholder will be WLALC to have carriage of the ACHMP. However, as you are registered it is necessary to send the document to all stake holders.

Please submit your comments by 5pm 25/2/2024.

If you have questions or would like to chat you can call me on 0403071922.

All the best,

Len Roberts

MCAS

--

Bec Young

Murrooma Operations Manager

0421078695

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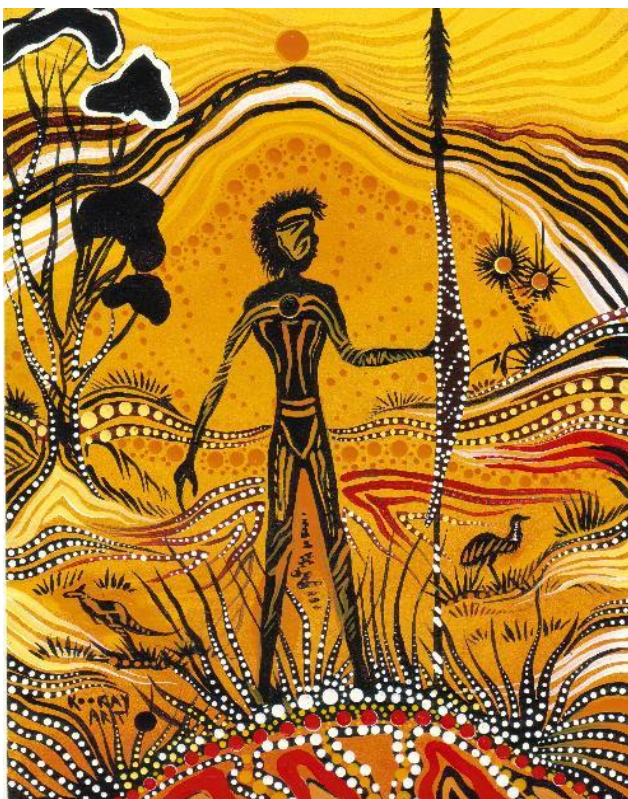
Bec Young

Murrooma Operations Manager

0421078695

Appendix C

- **Aboriginal Cultural Heritage Induction Programme**



Aboriginal heritage is bursting with stories, traditions, and art that have been shared and cherished from generation to generation. More and more people are realising just how important this heritage is for staying connected to Aboriginal identities and traditions. By celebrating this rich culture, we're also helping Aboriginal communities have a bigger say in how they preserve and share their unique traditions!

Aboriginal Cultural Heritage is Full of Life!

Aboriginal culture includes many things, like:

- Fantastic art
- Traditional dances and songs
- Ancient stories from the Dreamtime
- Knowledge of plants for healing
- Special ceremonies
- Unique languages
- Skills for making amazing cultural items

Aboriginal Cultural Heritage Induction Program

Author: Len Roberts (MCAS)
Photo left by Ray Smith – Kooray Art (used by Permission)

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Exploring the Rich Heritage of Aboriginal Culture

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A Legacy of Tradition and Identity

Aboriginal cultural heritage is rich and Abundant. Aboriginal people share and pass it down to each other over time. This includes things like traditions, stories, skills, and ways of expressing themselves, which are not always protected by laws.

Even though there are not strong laws keeping this heritage safe, it is starting to be recognised as very important for keeping Aboriginal culture alive. Celebrating this heritage helps acknowledge the rights of Aboriginal people to care for their culture. it also gives Aboriginal communities more power over how they protect and use their cultural practices.

Cultural heritage includes things like:

- art
- ceremonies
- creation stories
- the skills to make cultural items
- knowledge about using plants for medicine
- languages
- dance
- songs



Aboriginal heritage is shared from one generation to the next and changes as communities grow and respond to their surroundings and history, helping people feel connected to their identity and traditions.

The simplicity and self-sufficiency of Aboriginal society was observed by Captain Cook in



1770, and cited in Beaglehole, 1955 (p.399).

"From what I have said of the natives of New Holland they may appear to some to be the most wretched people on earth, but in reality, they are far more happier than we Europeans. They live in a tranquillity which is not disturbed by the inequality of condition: the air and sea of their own accord furnishes them with all things necessary for life, they covet not magnificent houses, household stuff etc., they lie in a warm and fine climate and enjoy a very wholesome air, so that they have very little need of clothing and this may seem to be fully sensible of, for many to whom we gave cloth etc. to, left it carelessly upon the sea beach and in the Woods as a thing they had no matter of use for. In short, they seemed to set no value upon anything we gave them, nor would they ever part with anything of their own for any one article we could offer them; this in my opinion argues that they think themselves provided with all the necessary's of life and that they have no superfluities."

In Australia, many places have a lot of historical and spiritual meaning for the local Aboriginal communities. In this guide, you will learn how to spot these sites, why they are important to the culture, and the laws that help keep them safe.



Questions

A Legacy of Tradition and Identity

1. What main aspects of Aboriginal cultural heritage are typically passed down through generations?
 - a) Only stories and art
 - b) Traditions, stories, skills, and ways of expressing themselves
 - c) Only language and songs
 - d) Government laws and regulations
2. Why is celebrating Aboriginal cultural heritage considered important?
 - a) It helps promote tourism.
 - b) It acknowledges the rights of Aboriginal people to care for their culture and empowers communities.
 - c) It generates income for the government.
 - d) It helps in modern education systems.



The Timeless Tradition of Aboriginal Art



Aboriginal Art

Australian Aboriginal art is among the oldest ongoing traditions of art in the world. Early forms of Aboriginal artistic expression were rock carvings, body painting, and ground designs, some dating back more than 30,000 years. This art reflects the diverse cultures of different Aboriginal communities, highlighting unique differences in mobs, languages, and landscapes.

Art serves as a connection between the past and the present, linking people to the land, the natural world to the spiritual realm. Much of today's Aboriginal art communicates important ancient stories, utilising symbols from the Dreamtime, which have been passed down through generations for around 50,000 years.

There are thousands of Aboriginal engraving and shelter art sites recorded around Gosford and across the Central Coast region. These rock art sites include animals, birds, sea creatures, bird tracks, human footsteps, male and female figures, hunting weapons and ancestral beings. Many sites are protected in the national parks of the Central Coast, but a surprisingly large number of recorded sites are on rural properties and industrial estates. Any of the sites were documented by W. D. Campbell in 1899,

Aboriginal rock art reveals three main styles associated with different regions:

1. Engraved Shapes: Found in Central Australia and Tasmania, featuring circles, arcs, and animal tracks.
2. Painted or Carved Images: Predominantly on the Australian east coast, depicting people and animals.



3. Detailed X Ray Paintings* Common in Arnhem Land, highlighting the internal structures of humans and animals.

Notable sites like the Dampier Archipelago in Western Australia boast the largest collection of rock engravings, with millions of petroglyphs,



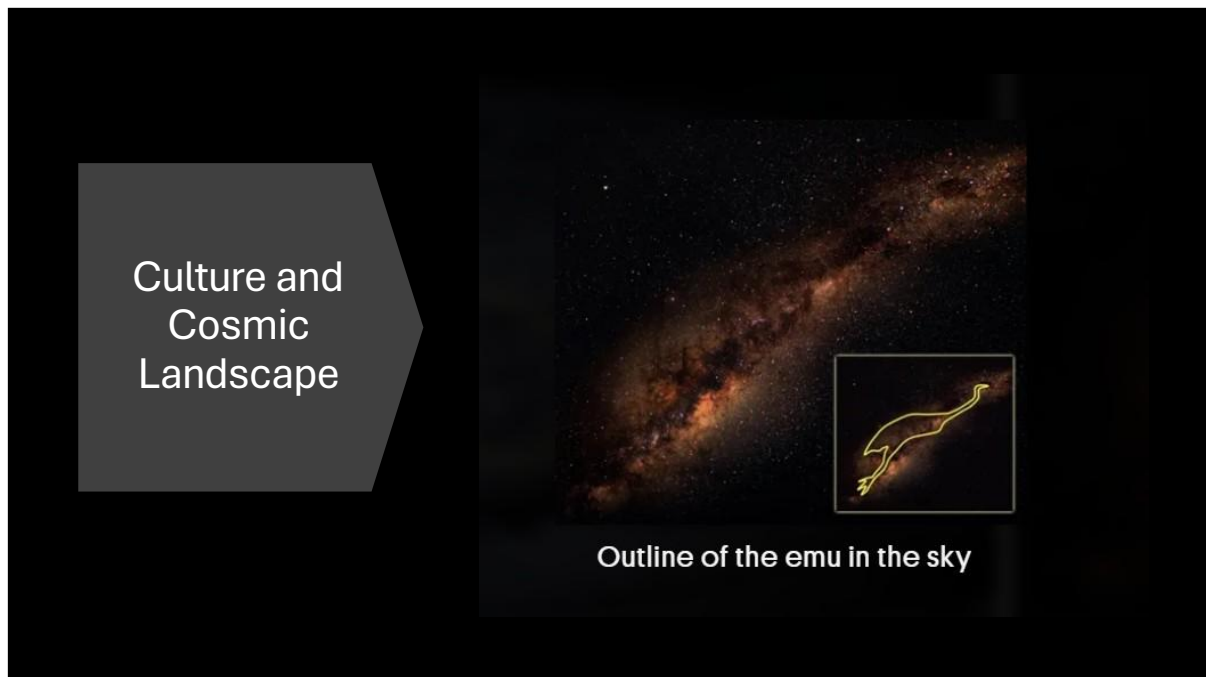
Questions

The Timeless Tradition of Aboriginal Art

1. Which of the following is not a common form of early Aboriginal artistic expression?
 - a) Rock carvings
 - b) Body painting
 - c) Digital art
 - d) Ground designs
2. What is the significance of symbols from the Dreamtime in Aboriginal art?
 - a) They are used for decoration only.
 - b) They communicate important ancient stories and cultural beliefs.
 - c) They serve as marketing tools for art sales.
 - d) They are a form of modern advertising.



Understanding Culture and the Cosmic Landscape



Aboriginal Culture often has a strong relationship with the landscape. The Australian landscape, at the time of European settlement, was the oldest continuing cultural landscape.

For Aboriginal Australians, their land contained cultural and social meanings developed through their long occupation of their respective landscape (lands and waters and skies and its air). They continue to see and perceive today their Country as being full of the places and objects that their ancestors left them as a living legacy.

Clarke, P.A. (2014) put it well in his article, The Aboriginal Australian cosmic landscape. Part 1: The ethnobotany of the Skyworld. *Journal of Astronomical History and Heritage*, 17(3), 307–335.

"To an Aboriginal, everything in their Country is alive and everything is embodied in relationships, whereby the past, present, and future are one, and where both spiritual and physical worlds of Country interact. The Dreaming is an ongoing celebration and reverence for past events: the creation of the land, the creation of law, and the creation of people."

Stories have been given to and vested in Aboriginal peoples from the Dreaming, everything comes into being through the expression or journey through story, and the Dreaming is the ancestors. All things exist eternally in the Dreaming; the Dreaming is



alive. The individual is born to Country, not just in Country but from Country, and his or her identity is inextricably and eternally linked to the Dreaming."

There are thus at the present day, dotted about all over the country, a very large number of special places associated with Aboriginal history, and connection to country which Aboriginal people celebrate and enjoy.

Elders share important Dreaming stories through special ceremonies, guiding the community in understanding significant places. The famous Uluru, previously known as Ayers Rock, features caves adorned with Aboriginal paintings, emphasising their spiritual connection to the land.

Dreaming illustrates that Aboriginal communities are custodians of the land; their ancestral journeys are tied to natural features that define their country. Knowledge of sacred sites is carefully passed down through initiations and Dreamtime stories.

In NSW, there are significant landscape features which to the locals is just as important as Uluru.

For instance, Boolahdilla Mountain (2 teeth) for the Worimi.

The sleeping lizard Landform (Baigum) at Lismore for the Bundjalung.

The ascension of the Creator's son at Nambucca near Faringdon Fields.

This community land is classified as an "area of cultural significance" The Nambucca Valley Council has made agreements with Gumbaynggirr elders in relation to the Faringdon Fields, including undertaking routine maintenance and planting trees.

Arrawarra Headland and Stone Fish Traps near Coffs Harbour

A sacred site that has been a meeting place for over a thousand years. The name "Arrawarra" comes from the Gumbaynggirr words "Yee Warra", which means "meeting place".



Questions

Understanding Culture and the Cosmic Landscape

1. What do Aboriginal Australians view their land as?
 - a) A commercial resource
 - b) Just a physical space to inhabit
 - c) A living legacy full of cultural and social meanings
 - d) An obstacle to development
2. According to Clarke, P.A., what is the role of the Dreaming in Aboriginal culture?
 - a) It is largely forgotten and has no contemporary relevance.
 - b) It serves as a historical record of past events without ongoing significance.
 - c) It is an ongoing celebration that links past, present, and future, and involves the spiritual and physical worlds.
 - d) It is merely a collection of myths that do not impact daily life.



Ceremonial Music, Dance, and the Role of Message Sticks

Ceremonial Music, Dance, and the Role of Message Sticks



Ceremony is vital in Aboriginal life. Tiwi Islanders, for instance, blend various art forms in their performances, incorporating significant movements and songs. Some Aboriginal clans keep their dances secret or sacred, so the areas where they dance are also special. Gender plays a big role in some ceremonies, with men and women having their own traditions.

Storytelling is a fundamental aspect of Aboriginal life, used for educating younger generations about cultural practices, spirituality, and local heritage. Not all knowledge is shared universally; some sacred information is reserved for initiated community members. Elders play a crucial role in this educational process, ensuring that cultural narratives and Dreaming stories are preserved for future generations.

Across Australia, Aboriginal people spoke 230 different languages and about 600 dialects, but they did not have a written language. Instead, they used something called a message stick to share information between tribes. They were used to pass on information such as announcements, disputes, invitations, warnings, meetings, events, and news of death. Each stick was carved with symbols and pictures, helping the person carrying it remember the message. These message sticks made it possible to send long or complicated messages between clans. Sometimes, they had special people called 'a messenger' who spoke several languages to help with translation. A message stick was like a passport, letting travellers enter and move through another clan's land. They were also used to invite other clans to meetings or *ceremonies called corroborees*.

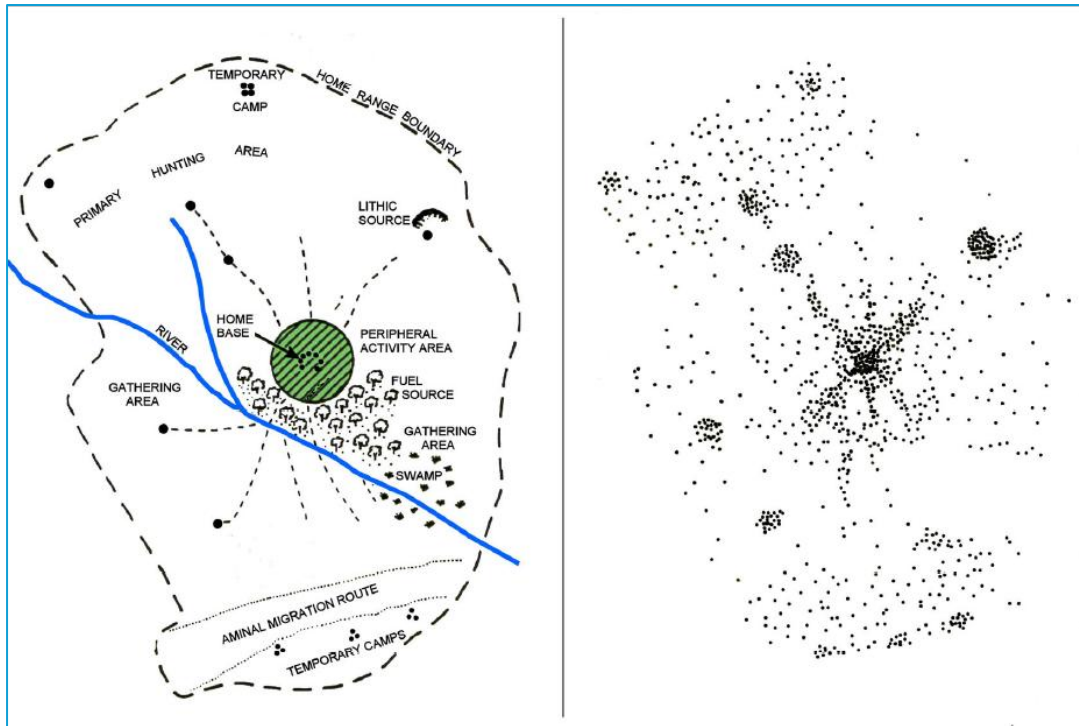
Questions

Ceremonial Music, Dance, and the Role of Message Sticks

1. What is the primary function of message sticks in Aboriginal culture?
 - a) To decorate homes
 - b) To serve as currency
 - c) To share information and communicate between tribes
 - d) To mark boundaries
2. How do Aboriginal ceremonies often vary?
 - a) They are irrelevant to gender roles.
 - b) They include only music and dance without storytelling.
 - c) They can be secret or sacred and often vary by gender.
 - d) They are the same across all tribes and clans.



Occupation Pattern



Aboriginal camping sites are often found near wetlands or swamps along major rivers and in places where there are good materials for making tools. There are two main ideas behind where these camps were located:

1. Aboriginal camp sites were always chosen for good shelter and resources.
2. Base camps were usually near reliable sources of water.

A general model of forager settlement patterning in the archaeological record has been established by Foley, R. 1981. *A Model of Regional Archaeological Structure. Proceedings of the Prehistoric Society.* 47: 1-17. This model distinguishes the residential "home base" site with peripheral "activity locations." Basically, the home base is the focus of attention and many activities and the activity locations are situated away from the home base and are the focus of specific activities (such as tool manufacturing). This pattern is illustrated below.

Archaeological findings suggest that these base camps were set up close to freshwater and food sources. They were in safe places where the climate was nice and where young children could be kept safe from danger. For this reason, campsites were not located near fast rivers, dangerous swamps, or steep cliffs. Many Dreamtime stories were made to warn children to stay away from risky areas. The paths from camps to other clans usually followed creeks or ridgelines.

Even though archaeological remains are often found near creeks—since they are the lowest and most natural gathering spots—camps were set up on higher ground.

It seems that if we consider the different natural factors and human activities, the archaeological evidence is more likely to be found in areas that have not been disturbed.

A lot of what Aboriginal people did in the past is not easy to see because many of their activities did not leave behind evidence that lasted a long time. A lot of their tools were made from things like wood and bones, which decay when they are outside. Even graves can be affected by the type of soil they are in. The evidence that does last, like stone tools and rock items, can be changed or damaged by how land is used today.

Things like stone axes were often taken by collectors even before it was against the law, and nobody recorded where they were found. Overall, what we can find on and below the surface really depends on natural changes, like erosion and weather, as well as human activities that can disturb those sites.

Before Europeans arrived, Aboriginal people lived around the area, moving freely over the river flats and timbered hills. They took only what they needed from the land and used fire to help them hunt kangaroos, which would come out after the grass was burned.

At the time Europeans settled, there were many Aboriginal people living around the lakes, rivers, and the coasts, organised in groups called Nurras, which were about 7km apart. Each Nurra had its own area, usually with 8 or 9 bark shelters for families.

Their population was supported by the food and water available in the area. Nearby swamps and streams were full of fish, birds, and other wildlife. Every morning and evening, they gathered food like fish and fruit, which meant they did not have to work too hard for their daily needs. This left them plenty of time to enjoy life with their families.



Questions

Occupation Pattern

1. Which of the following best describes two main ideas behind the location of Aboriginal camping sites?

A) Camps were primarily located near dangerous cliffs and fast rivers for strategic advantages.

B) Aboriginal camping sites were always chosen for good shelter and resources, and base camps were usually near reliable sources of water.

C) Campsites were often found near urban areas due to modern development.

D) Aboriginal camps prioritised proximity to natural resources only during the dry season.

2. According to the general model of forager settlement patterning established by Foley, what distinguishes a "home base" from "activity locations"?

A) A home base is always situated on lower ground, while activity locations are on higher ground.

B) A home base is the focus of attention and many activities, while activity locations are situated away from the home base and focus on specific activities.

C) Activity locations are where families live, and home bases are designated for tool manufacturing.

D) Home bases are temporary sites, while activity locations are permanent.



Tools, Weapons, and Technological Innovations



Australian Aboriginal people have used many kinds of tools and weapons in their daily lives, for gathering and carrying food. They created wooden tools from local materials, using different types of wood for specific purpose, and made string from plants or animal sinews. They even used plant glues. Fire was also used to bend wood or make it stronger.

One of their famous inventions is the boomerang, which was primarily used for hunting but also for ceremonies. Boomerangs can knock down small animals and are designed for different environments. For example, heavy boomerangs made from mulga wood were used in the desert for hunting kangaroos, while lighter ones made from mangrove trees were used on the coast for duck hunting.

Spears are another common tool used worldwide for hunting, fishing, and fighting. Aboriginal Australians invented the "woomera," a spear throwing tool that helps throw spears faster and farther. It is made of wood and helps increase the thrower's arm strength.

Different Aboriginal groups made different tools depending on where they lived. For example, coastal tribes used fishbone for weapon tips, while desert tribes used stone tips. Even with these differences, all Aboriginals had basic tools like knives, scrapers, spearheads, digging sticks, and containers for food and drink.

Aboriginal people made two important advancements with stone tools: they were the first to create cutting tools with ground edges and to grind seeds. They used these tools for various purposes, like making other tools, preparing food, chopping wood, and processing animal skins.

Questions

Tools, Weapons, and Technological Innovations

1. What was a major innovation created by Aboriginal people for hunting?
 - a) The spear
 - b) The rifle
 - c) The boomerang
 - d) The net

2. Which statement is true about the tools used by Aboriginal Australians?
 - a) All tribes used the same materials for tools regardless of location.
 - b) Tools were only used for hunting and not for any other purposes.
 - c) Tools and weapons varied greatly among different Aboriginal groups depending on their environment.
 - d) Aboriginal people did not have any specialisation in tool making.



Aboriginal Heritage in the Landscape

Aboriginal Heritage in the Landscape



Numerous Aboriginal sites have been identified in the region, with many more likely yet to be discovered. All such sites are legally protected under state and federal laws, making it illegal to harm or destroy them without permission from the NSW State Government. Significant penalties apply for such actions, and collecting artifacts is also prohibited. This cultural heritage is finite, fragile, and irreplaceable, some sites being thousands of years old. It is crucial to appreciate these sites without disturbing them, and any damage observed should be reported to local authorities. Certain landscape features are more likely to contain these important Aboriginal sites, which can include stone tools, hearths, food remains, and midden materials.

Archaeological studies indicated:

- Open campsites would be near water holes
- Grinding grooves are more likely to be found in rocky outcrops exposed by erosion or in creek beds.
- Scarred trees may be present in any type of landscape, but this would depend on the age and type of tree.
- Artefacts are more likely to be found along creek and drainage lines
- Stone arrangements and ceremonial artefacts are more likely to be found in significant landscape aspects such as caves and hills.
- Artefacts can be found in any landscape in proximity to an abundant food/water source.



- Archaeological evidence is more likely to occur in undisturbed areas.

Landscape features that indicate the likely existence of Aboriginal objects are:

- within 200m of waters, or
- located within a sand dune system, or
- located on a ridge top, ridge line or headland, or
- located within 200m below or above a cliff face, or
- within 20m of or in a cave, rock shelter, or cave mouth and is on land that is not disturbed land.

They set up camps in safe, high spots to avoid mosquitoes and strong winds. They would stay until they needed to move for hygiene or weather reasons. The high points near the lakes and rivers were great places to keep watch for animals and any visitors. They used special paths called song trails to travel to other areas. These high areas were also perfect for gatherings, where smoke from fires could be seen from far away to signal clan members.

However, as land was given to the new settlers, fences and farms started to block their traditional routes. Many Aboriginal people were pushed onto Missions and Reserves, losing access to their land and traditional ways of life. This meant that much of their history and connection to the land began to fade. Understanding this relationship can be helped by sharing stories from knowledge holders about the landscape that once was.



Pictorial representation of pre-European landscape



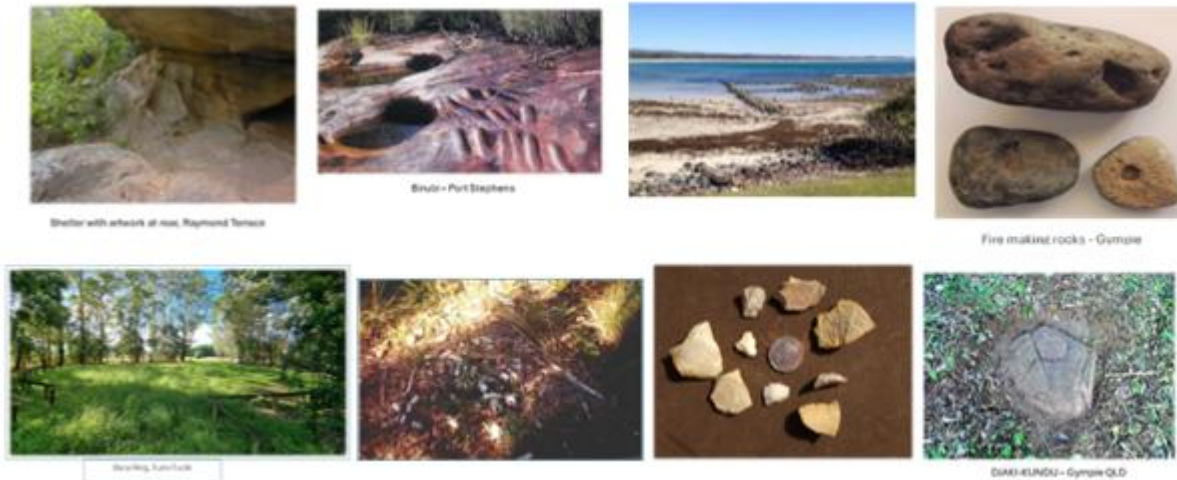
Questions

Aboriginal Heritage in the Landscape

1. Why are Aboriginal sites protected under state and federal laws?
 - a) They are considered valuable tourist attractions.
 - b) They are important for historical and cultural preservation.
 - c) They are easy to destroy without consequences.
 - d) They do not hold any significance.
2. What type of landscape feature is likely to contain Aboriginal artifacts?
 - a) Completely urbanised areas
 - b) Areas close to abundant food and water sources
 - c) Areas affected by heavy machinery
 - d) High mountain tops with no vegetation



A Comprehensive Guide to Artefact Identification



Finding and recognising Aboriginal artefacts is of immense importance in archaeology and cultural heritage preservation. These artefacts, ranging from tools and artwork to remnants of daily life, serve as vital links to the past, offering tangible connections to the long history of Aboriginal peoples in Australia. They provide invaluable insights into the traditions, lifestyles, and innovations of communities that have existed for tens of thousands of years. Moreover, these artefacts are critical for understanding the broader human story in the context of cultural diversity and technological evolution. Beyond academic and historical value, recognising and respecting these artefacts also holds profound significance for contemporary Aboriginal communities, affirming their heritage and ancestral connections to the land, thus playing a key role in the ongoing efforts toward cultural recognition and reconciliation.

Flaked stone Tools

Flaked stone tools were created by striking a piece of stone, known as a core, with a 'hammerstone,' often a pebble. This action removed a sharp fragment of stone called a flake.

Both cores and flakes were utilised as stone tools. While new flakes were very sharp, they quickly became dull with use and needed to be resharpened through a process called 'retouch.' This process involved further flaking to sharpen or shape the tool, resulting in a row of small flake scars along one or more edges.

Not all stones were suitable for tool making. The best stones for this purpose were rich in silica, hard, and brittle, including quartzite, chert, flint, silcrete, and quartz. Aboriginal people obtained these stones by quarrying bedrock outcrops or collecting pebbles from stream beds and beaches. Many flaked stone artifacts found at Aboriginal sites are made from stone types not naturally found in the area, indicating they were transported over long distances.

Locating Flaked Stone Tools

Flaked stone tools are the most prevalent type of evidence from past Aboriginal activities throughout Australia. These tools are commonly found at various sites, often alongside other remnants of Aboriginal occupation, such as shell middens and cooking hearths.

They are frequently discovered near rivers and creeks, where water access facilitated various daily activities. Stone tools are easier to locate in areas with sparse vegetation or where the ground surface has been exposed due to processes such as erosion.

Uses of Flaked Stone Tools

Flaked stone tools were versatile and could be produced rapidly, making them essential for numerous everyday tasks. They were commonly used for shaping materials such as wood, bark, and bone.

In hunting, these tools served as spear tips and were utilised as knives for butchering game. Additionally, they played a crucial role in the preparation of animal skins, which were scraped and processed to create cloaks, containers, and various decorative items.

Characteristics of Stone Tools

Sharp edges. Retouch along one or more edges. Composed of stone rich in silica. Stone type often differs from the natural rock found in the area



Flakes Typically, less than 50 mm in length. A 'striking platform' is visible. An impact point is often present on the striking platform. A 'bulb of percussion' frequently appears below the striking platform. May be shaped into recognisable tool forms, such as points or scrapers



Cores Generally, fist sized or smaller. Display one or more scars where flakes have been removed



Aboriginal ground edge axes: Are stone chopping tools with cutting edges that were formed by grinding. Axes were used to cut down small trees, chop wood, remove tree bark for canoes and shelters, butcher larger animals and undertake many other tasks. They also used axes as weapons, ceremonial objects, and valuable trade items.

Shapes and Sizes

Ground edge axes vary in shape, typically being round or oval. They often taper, being narrower at one end and broader with a straighter edge at the cutting side. Most axes measure between 50–200 millimetres in length, 40 to 100 millimetres in width, and 20 to 60 millimetres in thickness. When viewed from the side; they generally appear 'lens shaped.'



Material and Construction

These axes are crafted from hard stone types, notably basalt or greenstone, and occasionally from worn river pebbles. They may feature one or more ground cutting edges and are often polished smooth over the entire surface. The ground surfaces are usually highly polished. A groove may be pecked around the 'waist' of the axe to facilitate the attachment of a handle.



Frequency and Condition

Complete axes are rare finds. It is more common to encounter smaller, broken pieces that are polished.

Aboriginal Shell Middens

What Are Shell Middens?

Shell middens are piles of shells left behind by Aboriginal people after they ate shellfish. You can find these middens along the coastlines and riverbanks of New South Wales (NSW). They help us learn about the food, culture, and environment of Aboriginal communities. By studying the shells in these middens, we can better understand the past and why it is important to protect these sites for future generations.

Shell middens are important for several reasons:

- They show what kinds of food people ate and how they used natural resources.
- They give us clues about the environment when the midden was created.
- They help us understand the seasonality of traditional lifestyles.
- They reveal trade and social interactions among different Aboriginal groups, especially when they find shells that did not come from nearby areas.

In summary, shell middens are valuable archaeological sites that tell us a lot about the lives of Aboriginal people and the importance of understanding and protecting these historical treasures. It is more likely to come across an eroded or partially destroyed midden than a complete mound.





Eroded Shell Midden South Pindimar

Types of Shells Found in Middens



Oysters: These are the most common shells because they were often eaten by Aboriginal people living by the coast.

Cockles: These shells are generally found in muddy areas near rivers and are also commonly eaten.



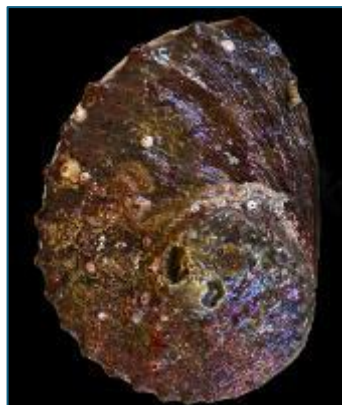


Mussels: Various kinds of mussels are often found, showing they were a regular part of the diet.

Pipis: These small shells, are found on sandy beaches,



Turban Shells: These are gathered not only for food but also, for use in traditional decorations and trading.



Abalone: Though less common, abalone shells are significant because they are bigger and harder to find.

Occupation sites

Occupation sites are places where Aboriginal people camped in the open or within rock shelters. These can be indicated by material remains including charcoal, rock art, shell, bones, artefact scatters, isolated stone artefacts and deposits, along with the remains of ovens or hearth sites.

Isolated Finds

Individual artifacts, like flaked stones, often suggest the presence of other nearby sites.



Artefact scatter

An Artefact scatter is an area where stone material is often seen exposed in the landscape. The artefact scatter can consist of both (left over material) and finished items left from the tool making process and include stone or shell. They are often found at occupation sites where Aboriginal people camped, as a result leaving material remains of everyday life including artefact scatters and isolated stone artefacts.



Axe Grinding Grooves

Indentations in soft rock where stone tools were shaped. These are typically found near water sources.



Birubi – Port Stephens



Shelter with artwork at rear, Raymond Terrace

Shelters with Art

Rock shelters often feature stencil art and charcoal drawings made using ochre, depicting various motifs related to Aboriginal culture.

Rock Paintings and Engravings

Found in suitable rock shelters and outcrops, these artworks serve as important cultural records and may provide insights into daily life and spiritual beliefs.

Bora or Ceremonial Grounds



Designated spaces for initiation ceremonies, marked by earth banks and pathways, embodying cultural and spiritual significance.



Bora Ring, Tucki Tucki

Rock Engravings

Common on flat rock surfaces, these designs include shapes of people, animals, and abstract patterns, often related to ceremonial practices.

Quarries

Locations where Aboriginal people sourced stones for tools or ochre for ceremonial purposes

Stone Arrangements

Deliberately placed stones that may signify ceremonial grounds or boundaries.



DJAKI-KUNDU – Gympie QLD

Water Holes

Essential water sources that often hold cultural significance and may be tied to creation stories.

Seed Grinding Patches

Areas worn smooth by grinding seeds into flour, common in arid and semi-arid regions.



Scarred and Carved Trees:

For thousands of years the Aboriginal people of central, north-western, and north coast NSW have ceremoniously carved trees as a form of artistic and cultural expression. Whenever you see a picture of an Aboriginal carved tree, it is more than likely from NSW.

Scarred trees are what was left after the bark was removed from a tree for use as burial wraps, canoes, coolamons, shelters, and shields. Scarred trees are still very prominent in our landscape though carved trees are very rare to see today due to them being destroyed and removed.



Modern carved tree Bulahdelah Mountain



Fish Traps

The fish traps work by using stone walls to guide fish that are swimming upstream into the holding ponds where the Aboriginal People traditionally caught them with their bare hands, used their spears or blocked them in ponds to be caught later. According to Aboriginal tradition, the ancestral creation being, Baiame, created the design by throwing his net over the river.



Arrawarra NSW

Burials Sites

Reflecting over 50,000 years of continuous culture, Aboriginal burials range from cremations to tree or rock ledge placements, and ground burials. Found throughout New South Wales, burials offer significant archaeological insights and are managed with high respect and traditional reburial practices when disturbed. In Aboriginal cultures, death is viewed as a profound transition rather than an end. It is believed that the spirit of the deceased continues to exist and maintains a connection with the living and the land.



Oven or hearth sites

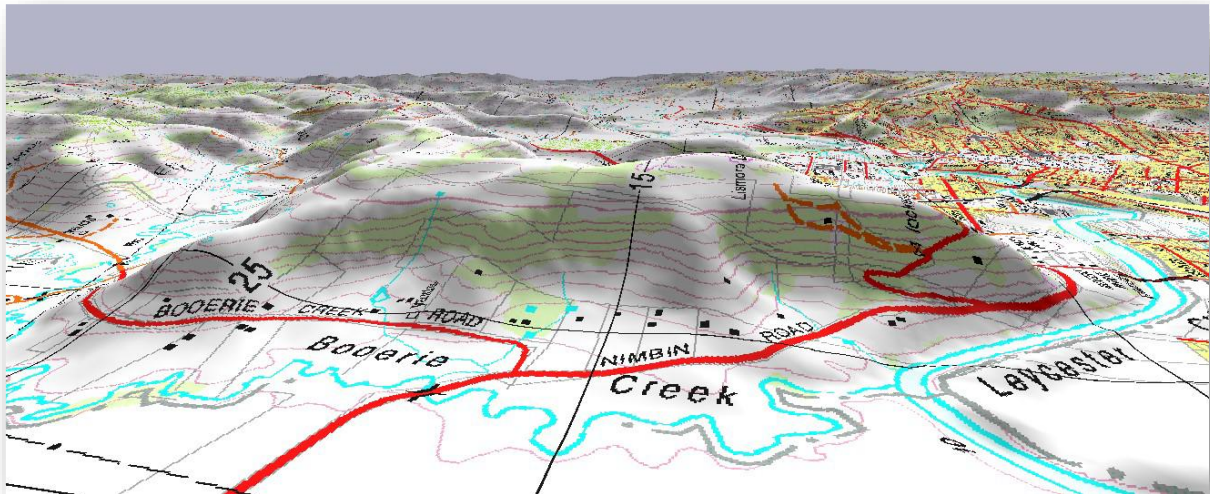
Are places where people used to have open fireplaces at home. These fireplaces have been common in different areas of Australia. They were used to keep warm, light up a space, cook food, and sometimes to send signals between groups. These hearths usually look like round piles made of burned clay or broken rocks from the heat. You can also find bits of charcoal, burned bones, shells, and tools or items made from stone around them.



Fire making rocks - Gympie

Point to Ponder

Seeing the Landscape from an Aboriginal Perspective. Without modern technology how were Aboriginal people able to view this landscape as a lizard?



Sleeping Lizard- Lismore

Significance and Protection

The preservation of Aboriginal sites is crucial for cultural heritage, offering insight into the life and practices of Aboriginal peoples. Legal protections are in place to safeguard these sites, which require responsible stewardship. Ongoing threats include erosion, human intrusion, and development activities that can significantly impact the integrity of these culturally rich landscapes.

Any interaction with Aboriginal objects or sites must be conducted with respect and in adherence to legal guidelines to honour the cultural values and ancestral connections they represent.

The following Flowcharts show what to do if you come across Aboriginal objects.



Flowchart 1 – Procedure for unrecorded Aboriginal objects

During the course of construction an Aboriginal Object or possible Aboriginal Object is identified work in the immediate vicinity is stopped and the project archaeologist (PA) notified



The AHA determines whether object is Aboriginal. If not work continues. If it is, the PA appoints a recorder to cordon off the object



Before the recorder picks up any artefact, the position of each potential artefact to be observed or recorded must be marked with a stake, flag, nail or similar, by the recorder.



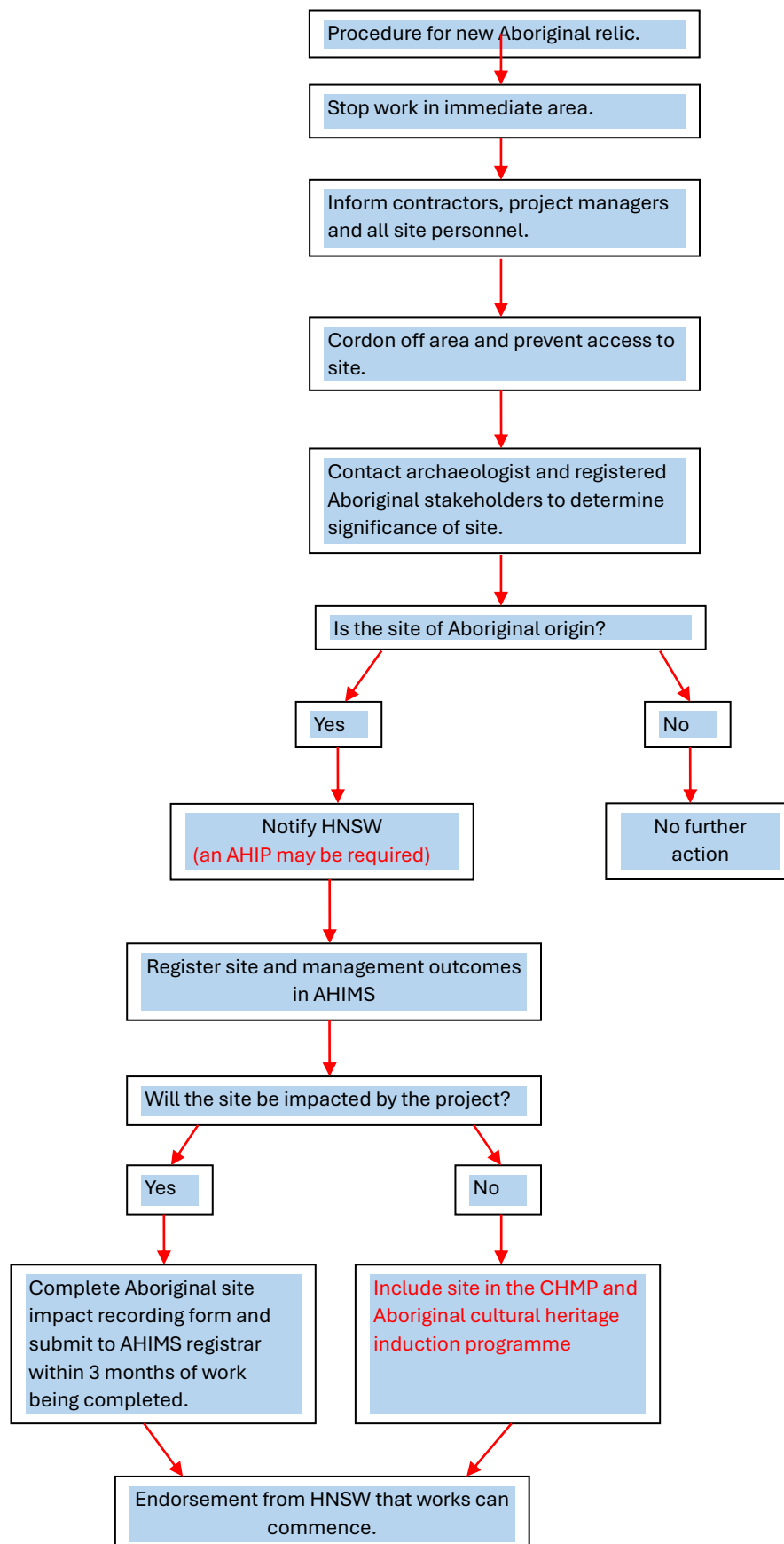
Once their positions are marked, each artefact may then be picked up and recorded (attributes, measurements, photography or drawing) before replacing in the exact same spot.



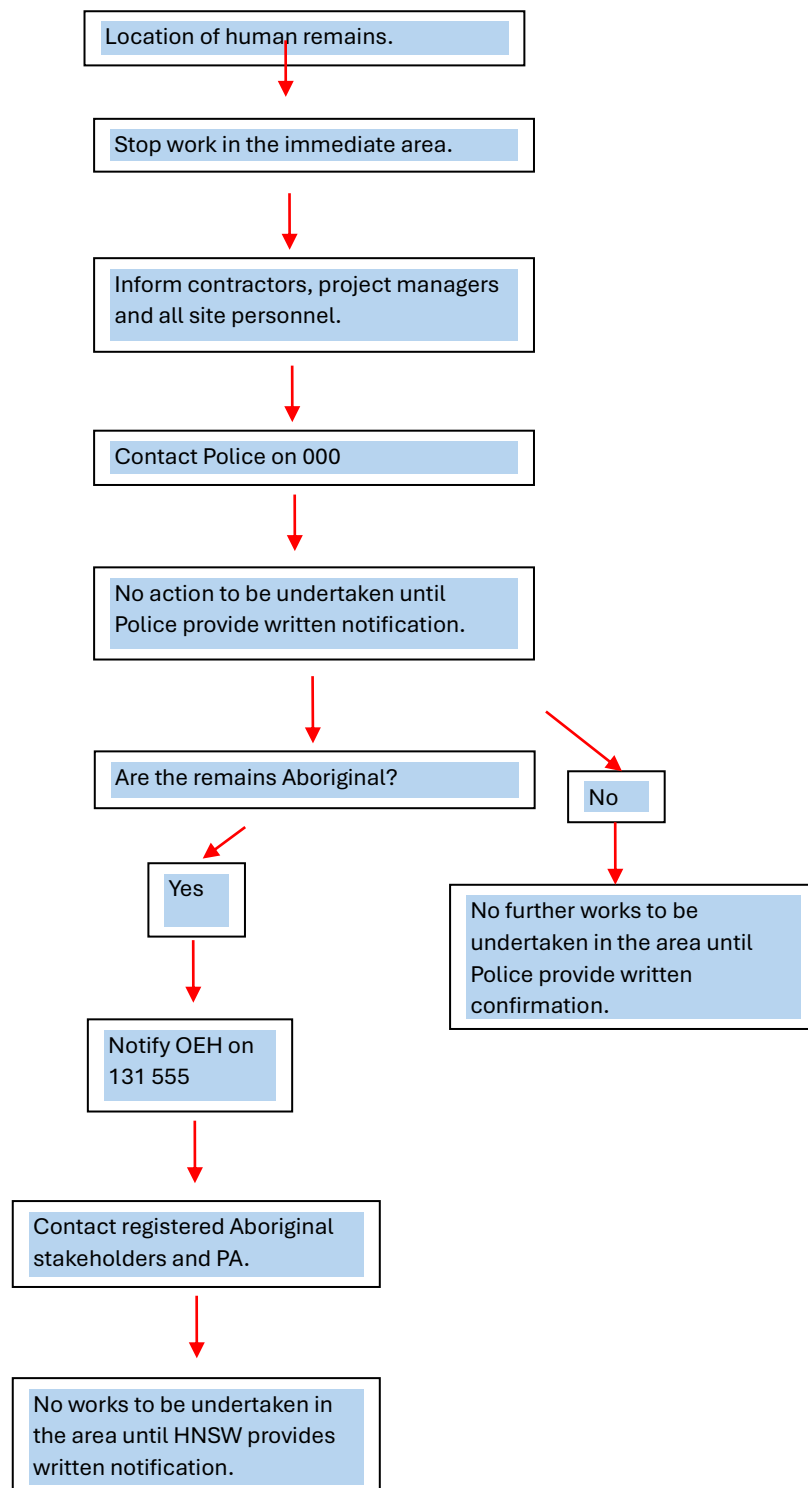
Notify HNSW
And follow their advice
(an AHIP may be required)



Flowchart 2 – Procedure for Aboriginal relics



Flowchart 3 – Procedure for human remains



Questions

Artefact Identification

1. Flaked stone tools are primarily created through which process?
 - a) Polishing smooth
 - b) Striking a core with a hammerstone
 - c) Moulding into shapes
 - d) Burning to create ash
2. Which of the following is a key characteristic of flaked stone tools?
 - a) They are always large and heavy.
 - b) They are made from a variety of organic materials.
 - c) They typically have sharp edges and may show signs of retouching.
 - d) They cannot be reused.
3. Why is it important to policies and procedures for unexpected Aboriginal finds?
Tick all that apply.
 - a) Cultural Respect and Heritage Protection
 - b) Legal Compliance
 - c) Consultation and Collaboration
 - d) Avoiding Disruption
 - e) Knowledge and Training

I want to extend my heartfelt thanks for your participation in the Aboriginal heritage induction training. Your commitment to understanding and respecting Aboriginal culture and heritage is truly commendable. By engaging in this important training, you not only enhance your own knowledge but also contribute to fostering a culture of respect and appreciation within our community. Your dedication to preserving and honouring Aboriginal heritage is invaluable, and we are grateful for your support in this endeavour.



Len Roberts

