Aboriginal Archaeological Assessment

For
Myall River Downs

At
Tea Gardens NSW

Prepared for
Great Lakes Council
PO Box 450
Forster NSW 2328

Job Reference 24737 - October 2008

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PROJECT: ABORIGINAL ARCHAEOLOGICAL ASSESSMENT, MYALL RIVER DOWNS, TEA GARDENS NSW	
CLIENT:	*GREAT LAKES COUNCIL*
OUR REF	*24737*
DATE:	*OCTOBER 2008*
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EXECUTIVE SUMMARY

RPS Harper Somers O'Sullivan (RPS HSO) has been commissioned by Great Lakes Council to assess the cultural origin of purported Aboriginal cultural heritage sites at Myall River Downs, Tea Gardens. An area within Myall River Downs has been proposed for the development of an eight lot rural residential subdivision by Crighton Property Pty Ltd.

Myall River Downs has been the subject of previous archaeological surveys with reports by Silcox (1999) and Environmental Resource Management Pty Ltd (2007). Silcox recorded ten Aboriginal cultural heritage sites (middens) during his survey, labelled M1-M10, it would appear that these were not recorded with the Department of Environment and Climate Change (DECC). A survey and subsequent report by Environmental Resource Management, to inform the proposed eight lot subdivision, differed in its opinion of the location and extent of the midden sites noted in the Silcox report.

This report, by RPS HSO, is based on a preliminary survey and a second more detailed survey. It was found that the sites identified by Silcox were middens of Aboriginal cultural heritage origin. As required under the New South Wales *National Parks and Wildlife Act 1974. S.91- Notification of Relics* they were recorded during the survey for listing with the NSW Department of Conservation and Climate Change (DECC) on the Aboriginal Heritage Management Information System (AHIMS). The sites labelled as M1, M2 and M3 by Silcox have now been recorded on the AHIMS as MRD1, MRD2 and MRD3. M4 to M10 remain to be assessed.

This report recommends that consultation occurs with the local Aboriginal community to develop an Aboriginal Cultural Heritage Management Plan (ACHMP) for the Myall River Downs area. With regard the specific sites, MRD 1 and MRD 2 are located within an area proposed for an eight lot rural residential subdivision. MRD1 is considered a High Significance site and should be excluded from development with an appropriate buffer zone and particular reference afforded it in the ACHMP. MRD2 was found to be in a highly disturbed state and following consultation with the Aboriginal community if development is proposed there are no considered impediments, *on scientific grounds*, to its destruction with a S90 application to the DECC required. MRD3 is outside the proposed development zone and should not be impacted upon, however, all care should be taken that inadvertent damage is not caused.

A full list of the Recommendations can be found in Section 9 of this report.

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1 INTRODUCTION

RPS Harper Somers O'Sullivan (RPS HSO) has been commissioned by Great Lakes Council to assess the previously identified Aboriginal cultural heritage sites of Myall River Downs, Tea Gardens. Myall River Downs has been proposed for the development of an eight lot rural residential subdivision by Crighton Property Pty Ltd. This will now be referred to as the subject area.

The subject area has been examined during previous archaeological surveys with reports by Silcox (1999) and Environmental Resource Management Pty Ltd (2007), however, it would appear previously identified Aboriginal cultural heritage sites were not recorded with the Department of Environment and Climate Change (DECC).

The scope of this assessment and report is to examine the Aboriginal cultural heritage sites identified by Silcox (1999) and reported by ERM (2007) and determine if the middens identified by Silcox (1999) are of human origin and if so make recommendations for their future management.

1.1 Background

A cultural heritage survey was commissioned for the Myall River Downs area by Parsons Brinkerhoff as part of a Local Environmental Study published in 2003. The survey carried out in 1999 by Rex Silcox, Archaeologist and Carl Simm, representing the Karuah Local Aboriginal Land Council identified ten Aboriginal cultural heritage sites. These sites while recorded in the subsequent report (Parsons Brinkerhoff 2003) were not reported on site cards to the DECC for listing on the Aboriginal Heritage and Information Management System (AHIMS). Consequently, there were no records detailing their location or status on the DECC AHIMS database.

In NSW, the *National Parks and Wildlife Act 1974. S.91- Notification of Relics* requires that Aboriginal cultural heritage sites when located should be recorded and listed with DECC for inclusion on the AHIMS database to ensure an accurate and full record is available to ensure the local Aboriginal community is aware of the location, to provide protection for the site and for research.

In 2007 Environmental Resource Management Pty Ltd (ERM) as part of the submission *Resolution of Deferred Matter – Great Lakes LEP 1996 (Amendment 44) and Statement of Environmental Effects* included a Cultural Heritage component. The Cultural Heritage component of the ERM report relied on the survey and report by Silcox that was included in the Parsons Brinkerhoff (PB) 2003 report. An inspection of the site was also conducted by ERM with recommendations made, however this site report was not included in the final document. The middens identified by ERM differed to that identified by Silcox in 1999 during a site inspection which confirmed that M2 lay outside of the proposed *8 lot subdivision* and revised the extent of M1 to cover a smaller footprint citing an overestimation of its size in the LES by PB. Once again, the Aboriginal cultural heritage sites were not recorded with the DECC.

In 2008 RPS-HSO was commissioned to confirm the presence of the middens and ascertain if the shell deposits were Aboriginal middens i.e. of human Indigenous origin and if so to fully record them for lodgement on the DECC AHIMS and provide recommendations for their future management.

RPS HSO archaeologists inspected the subject area referred to by both Silcox and ERM as containing Aboriginal cultural heritage sites in February 2008 (Darrell Rigby) and June 2008 (Nicole Davis and Laraine Nelson).

RPS HSO has been unable to access the full and original report of the LES by Rex Silcox in 1999. This study is relying upon Appendix D of the report presented by Parsons Brinckerhoff (PB) in 2003. (Appendix A).

Environmental Resources Management (ERM) conducted an archaeological site inspection for their Statement of Environmental Effects (SEE 2007). RPS HSO has not seen the site inspection report. (Appendix B).

1.2 Subject Area

The subject area is situated on the northern shores of Port Stephens. The general area known as Tea Gardens is bounded on the north and south by the Myall River, which forms a conduit to the Myall Lakes further north. The Tea Gardens area is low lying with slope gradients being generally <15% (Figure 1).

The subject area lies to the south east of Tea Gardens. Approximately 18 hectares in size it is bounded on the north by the newly developed Hermitage Lifestyle Resort and on the east and south by low lying dense forests and on the east by open forest and grasslands.

1.3 Legislative Context

Appendix C provides a general overview of the legal framework pertaining to the archaeological investigation and is provided solely for information purposes for the client and should not be interpreted as legal advice. RPS Harper Somers O'Sullivan will not be liable for any actions taken by any person, body or group as a result of this general overview, and recommend that specific legal advice be obtained from a qualified legal practitioner prior to any action being taken as a result of the summary below.

1.4 Scope of Assessment

This report is based on a review of the archaeology of the area, previous reports about Myall River Downs and a pedestrian survey of the areas previously designated by Silcox to be middens. The aim is to determine if the sites not reported with AHIMS are actually Aboriginal cultural heritage sites and if so to produce site cards, record the sites in an appropriate archaeological manner and to provide strategies for their management.

1.5 Aboriginal Consultation and Fieldwork

The Tea Gardens area is part of the Karuah Local Aboriginal Land Council (KLALC) area. Mr Carl Simm, representing KLALC, partnered Silcox during his 1999 survey of the area. This RPS HSO survey and report is designed to determine if the middens identified by Silcox are of Aboriginal origin. If they are determined to be middens then the KLALC will be advised and consultation conducted.

TITLE: Figure 1-1
Locality Map
Myall River Downs, Tea Gardens

CLIENT: GREAT LAKES COUNCIL

PLANNING SURVEYING ECOLOGY

HARPER SOMERS O'SULLIVAN

SCALE: 1 : 20 000 (A3)
DRAWN: L.Steel
APPROVED: D. Rigby
DATE: 22.08.2008
SURVEYOR:
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ORIGIN:
CONTOUR INTERVAL: N/A
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AUTOCAD REF: 24737-2A
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2 ENVIRONMENTAL CONTEXT

The environmental context section of this report describes data relevant to the specific subject area and broader areas. The environmental factors included are topography, hydrology, climatic conditions, fauna and flora resources and the geology in and around the subject area. The data from all of these elements are assessed to predict what the environment was like in the past, and thus how people interacted with the specific subject area.

If archaeologists know if the environment was inhabitable and the nature and density of resources available to past populations, then predictions of how the area was used (site type likely to be located), how many people the area could support (the density of the sites) and the chronological period the area was occupied (if the area was consistently used or rarely used). The environmental data will be combined with previous archaeological work conducted in the area (Section 4) to develop a predictive model for human occupation in the subject area (Section 5). The predictive model will then be tested in the field survey.

The subject area is located at Tea Gardens on the northern shore of Port Stephens, which is 130kms sailing distance north of Sydney and 33kms from Newcastle. It is an extensive natural estuary with an area of 10,000 hectares. The foreshore is 250kms in length and encompasses the transitional area between the aquatic and terrestrial environments. It contains a diversity of habitats, beaches, rocky headlands, salt marshes, mangroves and wetlands and is affected by a range of physical processes including wave run-up, erosion and sea level changes (Tawse & Hudson 1998:2).

2.1 Geology and Soils

The general broad scale geology consists of a complex of Permian shales, sandstones, conglomerates, volcanics and coal measures (Morgan, 2001). The study area comprises two soil landscapes. The first (Murphy, 1995:98) is known as the Fullerton Cove landscape which comprises of a broad, flat, swampy, Holocene period estuarine plain. This landscape chiefly refers to the estuarine perimeter of the study area. It features silt, clay and estuarine sediments with shell layers common. The soils are deep solonchaks – organic rich black loam (>300cm). It is very poorly drained (ibid).

The second landscape is termed Tea Gardens (Murphy, 1995:123). It consists of Pleistocene beach ridges with marine and Aeolian quartz sands. The soils are often deep (>300cm) and consist of imperfectly drained humus podzols on the ridge areas with poorly drained humus podzols in swales or saddles (ibid).

2.2 Climate

The climate of the Port Stephens region is considered temperate, with a maritime influence. The average daily temperature in January ranges from 27.5 ^{0} Celsius to a minimum of 17.6 ^{0} Celsius. Temperature in the Port for July ranges from 17.3 - 7.7 ^{0} Celsius. Tea Gardens has an average rainfall of 1328 mm annually (Australian Bureau of Meteorology www.bom.gov.au).

2.3 Topography and Hydrology

Port Stephens is a drowned-river valley estuary with a relatively unconstricted entrance, incised in parts into Pleistocene barrier and estuarine deposits. In eastern sections it is subject to extensive active tidal-delta deposition events. Extensive Pleistocene mud deposits are present on the surface around the western perimeter of Port Stephens and adjoining alluvial valleys (Troedson et al 2004:71).

The Fullerton Cove landscape offers tidal flats with a relief of less than three metres and slopes less than three percent. They are regularly subjected to inundation by brackish tidal waters (Murphy, 1995:98). In order of elevation are four zones, mudflat, mangrove, saltmarsh and littoral forest. All zones except for littoral forest suffer non directional mostly uninterrupted drainage patterns (ibid).

The Tea Gardens landscape beach ridges or relict foredunes generally follow a NE-SW orientation, in keeping with the coastal alignment. The relief seldom is greater than one metre or exceeds a slope of more than five degrees. The overall elevation approaches between five and eight metres but is often, nearer to the inner barrier depression, as little as two metres ASL (Murphy, 1995:123). The ridges are well drained but the swales are regularly waterlogged with the watertable in most places less than 1 metre below ground surface (ibid).

2.4 Flora and Fauna

Common to the study area are *Eucalyptus Gummifera* (Red Bloodwood), the flowers of which were sucked by Aborigines to access the nectar. The resinous sap was often utilised to prevent fishing lines from fraying (Robinson, 1994:42). *Persoonia Spp*. (geebung) also present in the study area and has edible fruit. They formed part of the Aboriginal diet (ibid:100). There are 42 species of geebung. *Pteridium Esculentum,* commonly known as bracken fern, is present in the study area. William Bradley documented it in 1788 that 'the (bracken) fern and some other roots' were prepared by NSW coastal Aborigines by wetting and beating between two stones over a long period of time and then used as a food staple (Robinson, 1994:311). Grass Trees are common in the region (*Xanthorrhoea spp*.) and were exploited by Aboriginal people for multiple uses. The leaf bases, young flowers and shoots could be eaten, the flowers may have been soaked to make a sweet drink and seeds are documented as having been crushed to make flour (Laffan & Archer 2004:38). In addition, the resinous sap was used to haft stone tips and axe heads to timber and the long woody flower stalk was often used as a spear shaft (Laffan & Archer 2004:68). Medicinally, the gum may have helped to clear blocked sinuses and was used as a sedative for babies (ibid). Paperbark trees, (*Melaleuca quinquenervia*) had multiple uses also for Aboriginal People and are highly endemic to swamp and marsh areas. The bark was stripped from trees and used for shelters, for covering food (bush gladwrap) and for making fires. The flowers were soaked in water to produce a sweet drink (Robinson 1994:55).

Other vegetation species typical of the study area include swamp mahogany (Eucalyptus Robusta), yellow tea tree (*Leptospermum polygalifolium*), red bottlebrush (*Callistemom citrinus*), dog rose (*Bauera rubioides*), dagger hakea (*Hakea teretiflolia*) northern Christmas Bells (*Blandifordia Grandiflora*), native heath and flat cord rush (*restio complanatus*) (Murphy C.L.1995:123).

The 2003 Local Environment study for Myall River Downs (Parsons Brinckerhoff 2003:3-17) lists 22 mammals, eight bats, 98 birds 15 reptiles and nine frogs as being identified during a nine day survey exercise. Seven threatened species were listed; koala, squirrel glider, eastern chestnut mouse, eastern blossom bat, powerful owl, osprey and wallum froglet.

2.5 Existing Condition of the Subject Area

The subject area comprises part of the former 490 hectare grazing and pine plantation property of Myall River Downs. The property, which is still grazed by cattle, has the newly established Hermitage Lifestyle Resort to the north of the site MRD1, a new residential housing developments to the north of and outside the area under review, a defunct pine plantation and an operational small scale sand mine opened in 1960's.

The majority of the property grazed by cattle presents as an open forest dominated by *Eucalyptus gummifera* (Red Bloodwood) and *Eucalyptus robusta* (Swamp Mahogany). In this area the understorey is non existent making access easy however a dense grass groundcover limits visibility.

Littoral forests within the subject area lie to the south and east of middens MRD1-MRD3 with the area to the west and Kore Kore Creek dominated by Melaleuca species. The littoral forest presents as a close forest with dense understorey presenting a virtually impenetrable barrier.

The use of sections of the property for a pine plantation is in evidence with scattered stands of *Pinus radiata* to the south. The regrowth of native and introduced understorey species in this area has been significant. Like the littoral forests this area is virtually impenetrable. In the area to the south of Aboriginal cultural heritage site MRD3 a disused south running access track is under water, evidence of the low lying and swampy nature of the terrain.

3 OVERVIEW OF THE PAST

The Worimi people were the traditional custodians of the lands to the north and south of Port Stephens. Within the Worimi people sub-groups existed and the people to the north of Port Stephens were known as the Gampignal (Bairstow 1993:6).

An important source of information is the work of Boris Sokoloff (1973) who conducted a detailed study of the ethnographic and archaeological records of the Worimi people. While his work focussed on the southern area of Port Stephens the information is relevant for the northern Port Stephens area.

Sokoloff, amongst other sources, accessed the records of the Australian Agricultural Company (AA Company). Founded in 1824 with a holding of one million acres it was initially established at Carrington, on the north western shores of Port Stephens, under the leadership of the humanitarian Robert Dawson. Dawson's management ensured that to some degree the Aborigines were protected from the ill treatment that blighted settlements to the south in Newcastle and to the north at Port Macquarie.

3.1 The Pre-Contact Phase

Sokoloff benefited in his ethno-historical research from the protection afforded the Worimi people in proximity to Carrington, the AA Company headquarters. Dawson (1831) and later Scott (1923) provided detailed accounts of the Worimi and their lifestyle. The evidence is of small family groups that utilised the rich resources of the Port Stephens area. These family groups had no leader but relied on the influence of respected elders. These small family groups were part of a larger network that formed the Worimi who engaged in ceremonial occasions on a regular basis (Sokoloff 1973: 104).

The variety of foods available was commented upon by a number of early observers of the lifestyle of the people (Sokoloff 1973: 52), and describes kangaroos only being killed rarely, even though they were in abundant numbers (Caswell in Sokoloff 1973: 52). Evidence suggests that their diet relied heavily on harbour and sea-shore resources with terrestrial resources less frequented (Sokoloff 1973: 52). There is similarly a lack of detail on the use of plants for foods. Bungwall fern, a species of yam and the stalks of the giant lily were favoured, while a favourite of children was the dwarf Banksia flowers (Sokoloff 1973: 54).

3.2 The Post-Contact Phase

Prior to the arrival of the Australian Agricultural Company (AA Company) in 1826 the Port Stephens area was utilised by sawyers and log fellers to obtain timber. Most indications are that they acted with cruelty and disdain to the local people and established a very poor relationship for settlers that followed (Bairstow 1993: 6).

The AA Company under the authority of Robert Dawson provided a change of attitude for the Aborigines. The main settlement at Carrington provided a base for the pastoral company with sheep, timber getting and subsistence farming.

Dawson showed considerable respect for the local people, employing them to assist in clearing and building at Carrington and with pastoral work. By 1827 the small settlement largely relied on the support of the Aborigines. At the same time Carrington became a haven for Aborigines throughout the district escaping poor treatment. AA Company Return of Sick records for 1826 however reveal that serious

diseases were increasingly affecting the local peoples. In the following years as the number of convicts and emancipists increased in the area so did the incidence of venereal disease. Dawson had set in place protection for Aborigines working for the AA Company however those Aborigines outside the area were not so fortunate (Bairstow 1993:12).

The departure of Dawson from Carrington in 1828 resulted in a break down of the relationship between the AA Company and the Aboriginal peoples. By this time disease was also taking its toll with the numbers of Aboriginal peoples declining (Bairstow 1993:13).

William Scott, who was born at Carrington and whose father was made an honorary member of the Worimi tribe reports of measles epidemics decimating the local Aborigines during his youth and further that in 1873 when he left Port Stephens, only about 50 tribe members still remained (Scott 1929: 35).

The European history of the Tea Gardens area is linked to the early timber getters and fishing industry with the Myall River acting as a conduit to industry within the Myall Lakes. This is in evidence at Witts Island, Tea Gardens which feature archaeological remains of slip yards and vessels that were part of the early ship building and repair industry (Great Lakes Heritage Study 2003: 38).

In the vicinity of the subject area in the 1930's Australian Pine Products established a pine plantation removing much of the native vegetation species in the process. While the pine plantation has ceased operating remnant pine trees can be seen throughout the re-vegetated landscape. Extensive clearing has taken place in much of the Myall River Downs area as part of the grazing regime for cattle. A number of man-made drains now intersect the area to channel water toward the southern low lying areas (Silcox 1999).

4 REVIEW OF DOCUMENTARY AND PHYSICAL EVIDENCE

4.1 Historic Archaeology

Non-Indigenous archaeology poses no restraints across the subject area. A search of the Great Lakes Heritage Study - Draft (2003) revealed no recorded sites within the subject area. This was confirmed by Silcox in his 1999 survey which recorded no European structures or items of historical significance.

4.2 Aboriginal Heritage Information System

An AHIMS search was requested and unfortunately an error occurred in the information supplied by DECC. While one of the sites AHIMS 38-5-41 (Limekilns) was in the survey area, the other AHIMS data supplied were for sites in the Forster area approximately 40 kilometres north of the subject area.

Table 4-1: AHIMS Results

AHIMS No. & Name	Site type	Location	Contents
38-5-41 Limekilns	Midden	Adjacent a channel	Shell, stone choppers, hammer stones

4.2.1 Aboriginal Archaeology in the Subject Area

Rex Silcox has conducted two archaeological surveys in the area known as Myall River Downs. The first Silcox (1998) located one stone artefact scatter (two artefacts) and an isolated find. The 1999 survey for the subject area is discussed in detail below.

4.2.2 Silcox (1999)

Rex Silcox was commissioned by Parsons Brinkerhoff in 1999 to carry out an archaeological survey of the subject lands for both Aboriginal and European archaeological material. In November of 1999, an inspection of the subject area was carried out over several days by Rex Silcox and Carl Simms of the Karuah Local Aboriginal Land Council. The survey covered 80 percent of the subject area *excluding the SEPP 14 wetlands*. Several transects were walked focussing on the Pindimar Bay wetlands and Kore Kore Creek in the west, the margins of three natural creek lines and the central portion of the subject area. Comment was made on the limited visibility available in each area.

Silcox commented that the SEPP 14 wetlands were not surveyed due to the dense vegetation coverage offering low visibility and the assumed protected status of the wetlands.

Silcox made a search of the Aboriginal Heritage Information Management System (AHIMS) to identify previous Aboriginal studies conducted in proximity to the subject area and to also identify known Aboriginal archaeological sites. 49 sites were listed on the AHIMS register. It would appear that one of these sites 38-5-41, a midden, is located inside the study area at the western end of Limekilns Road. Middens

accounted for 70 percent (35) of the total sites returned from the AHIMS search. Silcox comments that most of the midden shell deposits were relatively shallow and in disturbed contexts. He also states that many of the previous systematic archaeological investigations carried out in the Tea Gardens area suffered due to poor visibility and that more sites probably exist than have been formally recorded.

Research on European archaeology was conducted by consulting with the Great Lakes Council heritage / planning officer, the Great Lakes Council Local Environmental Plan (LEP), the Hunter Regional Environmental Plan and the NSW Heritage Council Register. No European structures or items of historical significance were identified from these searches.

The survey conducted by Silcox recorded a total of ten (M1 – M10) midden sites (Figure 4-1). All were situated on the cleared margins of the SEPP 14 wetland. No sites were identified on sand plains away from the wetland margins.

Sites M1-M5, situated on a low rise along the edge of swampy terrain were in heavily disturbed contexts as a result of clearing activities. However, Silcox comments on the possibility that the clearing had only impacted on the surface and upper shell layers, leaving good potential for intact deposits below ground level.

Sites M6 – M10 were also heavily disturbed along the western edge of the subject area bordering Kore Kore Creek, the terrace edges and creek flats. No comment is made as to integrity of subsurface deposits.

Analysis of shell fragments revealed three species of shellfish;

- Mud Whelks
- Sydney Cockle
- Rock Oyster

A full account of the middens recorded by Silcox can be found in Table D.2 of the Parsons Brinkerhoff 2003 report (Appendix A). Table 4-2 following provides co-ordinates obtained by RPS-HSO from geo-rectifying Figure 3.12 found in Silcox, 1999 in a GIS. Ground truthing for sites M1-M3 confirmed the probable accuracy of these derived co-ordinates using a differential GPS, in a site visit conducted on 12/2/2008.

Table 4-2: Midden Co-ordinates.

Co-ordinates for Midden Sites - Myall River Downs	Column1	Column2
	MGA Zone 56 (GDA 94)	MGA Zone 56 (GDA 94)
SITE NAME	**(Easting)**	**(Northing)**
M1	419876	6385890
M2	419347	6385769
M3	418858	6385766
M4	418352	6385995
M5	418214	6386205
M6	418036	6386317
M7	418150	6386553
M8	418007	6386647
M9	418279	6386971
MRD10	418363	6386865

Figure 4-1 displays the above midden locations relative to the proposed eight lot subdivision including the whole Myall River Downs subject area.

Silcox – From *Discussion*. The ten midden sites consisted of sparse scatters of whole shells and shell fragments. Silcox comments that assessing archaeological significance for each of the sites was difficult due to the amount of disturbance and the displacement of site material. However, Silcox notes that occupation would have been almost continuous along the wetland margins where most of the midden sites discovered during the survey were located. This would have resulted in a series of base camps characterised by a concentration of discarded shell remains linked to lower intensity occupation areas denoted by a lesser concentration of shell discard. Resource zones around creek junctions and wetlands would have been exploited as they offered a variety of resources.

Some sites included stone artefacts, all of which were made of similar material, fine-grained volcanic tuff, all of which dated from mid-late Holocene age (approx. 5kya – present). Silcox carried out analysis of a sample of shell fragments, the results of which was limited to the three species listed above. Citing the highly disturbed and dispersed nature of the sites, no other items such as fish bones for example, were identified which limited available evidence relating to the exploitation of other resources.

ERM (2007)
The survey by ERM confirmed the finding of 10 (M1-M10) middens by Silcox. There is no detail provided in the ERM report other than a site inspection was conducted. The report indicated that:

- M2 was not in the area to be impacted on; and the
- Size of M1 had been over estimated in the Silcox report. ERM confirmed the high sensitivity given to M1 and proposed that the area be excluded from development.

4.2.3 Aboriginal Archaeology in the Region of the Subject Area

A number of Aboriginal cultural heritage surveys have been conducted in the area. Shell middens have been the most commonly found site.

ERM (2007a) *Riverside at Tea Gardens. Aboriginal Heritage Assessment.*
The Assessment was of an area, also owned by Crighton Properties Pty Ltd, to the north of the subject area. Conducted as a desk top review, it relied on an earlier survey and report by Bradshaw.

Kinhill (1994) *An Archaeological Assessment of the Shell Midden no. 38-5-0147. Tea Gardens.*
This area was previously investigated by Dallas in 1982. This subsequent survey identified another midden (AHIMS 38-5-0147). A DECC S.87 for a test excavation was applied for and granted. Excavation revealed that the site was of low to moderate significance. Shell species recorded were whelk, oyster and some cockle. Stone artefacts were present.

Dean-Jones (1989) *Report of an Archaeological Survey of a Caravan Park - Tea Gardens*
No sites were located.

Brayshaw (1988) *Archaeological Survey at Tea Gardens.*
This formed the basis of the later ERM 2007a report. The survey area included the Myall River where one shell midden was located on the river bank, opposite Dredge Island. The site is recorded as (AHIMS 38-5-0148).

Dallas (1982) *Waterview Estate Canal Subdivision, Tea Gardens.*
A shell midden (AHIMS 38-5-0076) was identified on an elevated area of a swamp adjoining the Myall River. Shell species identified included whelk, cockle and oyster. Stone artefacts were also present. The site was highly disturbed with a DECC S.90 applied for and granted to permit destruction.

Dyall (1971-1980) *Port Stephens North Side. Aboriginal Sites.*
Dyall produced an unpublished survey of sites conducted over a number of years. While these sites are predominately along the ocean beaches and rock platforms to the east and north of the subject area, they provide a valuable insight to the depth and variety of archaeological material in the area prior to development. The two sites closest to the subject area are Winda Woppa and Yacaaba, the northern headland of Port Stephens. In 1972 Dyall records a site at Yacaaba containing extensive shell deposits and records 37 waste flakes and 20 implements including cleavers, cores, anvil, blades and scrapers. In 1980 he observed spade-shaped turban shell, a preliminary process type he considered in the production of fish hooks. Dyall also observed faunal material such as fish and bird bone.

Prior to 1975 Dyall visited the Winda Woppa site within Port Stephens observing shell middens five to twenty feet above the mangrove swamp banks of the Myall River. In 1975 when he revisited the site a housing development had obliterated the site. He noted the predominate shell fish was cockle (*Anadara trapezia*) with very few oyster (*Ostrea angasi*) Dyall indicated this was surprising as there were abundant oysters within the bay nearby, however the current abundance of oysters now may be a result of their detaching from the abundant oyster racks nearby.

TITLE: Figure 4-1
Silcox Midden Locations
Myall River Downs, Tea Gardens

CLIENT:
Great Lakes Council

PLANNING SURVEYING ECOLOGY

HARPER SOMERS O'SULLIVAN

SCALE: 1 : 15 000 (A3)
DATE: 22.08.2008
DRAWN: L Steel
APPROVED: D. Rigby
SURVEYOR:
DATUM:
ORIGIN:
CONTOUR INTERVAL:
SHEET 1 of 1
AUTOCAD REF: 24737 ARCH
LAYOUT REF: FIG 4-1
JOB REF: 24737

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5 PREDICTIVE MODEL OF THE SUBJECT AREA

In Aboriginal cultural heritage surveys an assessment of the current and past environment, ethnographic research and reference to previous archaeological surveys provides a basis for a predictive model.

Predictive modelling is valuable in that it provides a basis for assessing how the landscape might have been used by the Aborigines and consequently what record of that use might remain. In areas where ground visibility is poor predictive modelling assists in determining the potential for sites and site type.

5.1 Framework

The environmental data discussed in Section 2 and the previous archaeological research discussed in Section 4 was used to formulate the following predictive model of sites and their context potentially located within the subject area.

A glossary of Aboriginal site types can be found in Appendix D.

5.2 Aboriginal Predictive Model for the Subject Area

Site types

The site types recorded in the area are middens, open campsites and isolated finds with middens the most commonly occurring.

The climate information indicates that the area was suitable for habitation year round. The low relief of the area means that if any of the sandstone bedrock was exposed, it would be unlikely to have been suitable for a rock shelter. Any rock outcrop located close to drainage lines or chain of ponds could be a suitable place for grinding tools or food. The rock formation in the immediate subject area is unlikely to be a source of raw material for most stone tool manufacturing; however, mudstone may have been sourced from the conglomerate, when other raw materials were running low. Within an easy days walk from the subject area, there are other known raw material sources for good quality silcrete and mudstone.

Site Location and Distribution

All previous archaeological survey reports conducted away from the shores of Port Stephens and the ocean beaches reported sites as being within close proximity to drainage lines. The environmental data indicates that the northern Port Stephens area would have been able to sustain large groups of people for an extended time. The evidence provided by Dyall suggests that the larger more permanent campsites were situated within close proximity to the diverse environment of ocean rock shelfs, beaches, estuarine and freshwater swamps. It is likely that environments like the subject area were used to supplement resources found closer to the preferred environment and large campsites. Drainage lines acted as both a source of fresh water and conduit for travel, consequently it is expected that sites will be located along and in proximity to drainage lines.

Site Aspect

Given the low terrain of both the subject and surrounding area site aspect is not considered in the survey reports.

Slope

The terrain of the subject area is predominantly low, with slopes < 3°. Archaeological surveys within the area reveal a preference for sites to be located on the slightly elevated landform adjacent the river or wetlands. The Silcox survey revealed a pattern of midden sites along a low rise on the margin of a wetland that borders Pindimar Bay on Port Stephens.

Distance from Water

Water would be available across the wider area and particularly along Kore Kore Creek or the numerous drainage lines that mark the landscape.

Food

Within a five kilometre radius a range of environmental types were available these include; the enclosed waters of Port Stephens; the ocean beaches and rocky headlands of Providence Bay and Yacaaba Head; the estuarine Myall River and the open forest of the western ridge lands beyond Kore Kore Creek. A diverse and abundant variety of flora and fauna, both terrestrial and estuarine would be available throughout the region.

In Summary

The area presents as a particularly diverse and abundant environment for exploitation by Aboriginal peoples. Scott (1923) provides a detailed account of the local people hunting and fishing, with particular reference to their skill at fishing and a preference for oysters.

While the majority of campsites recorded on the AHIMS for the area are small in size, it does not reflect the Aboriginal occupation. In coastal NSW the most common Aboriginal cultural heritage site type is the midden. Large middens comprising densely packed shell was used from the earliest period of European settlement and again during the 1930's depression for the production of lime from shell burning. The destruction of the majority of middens, particularly the large has resulted in a incomplete archaeological record of the use of coastal environment by people prior to European settlement. The presence of Limekilns Road immediately to the south of the subject is an indication that this area has also been subject to the systematic destruction of middens.

6 FIELD SURVEY

A survey was conducted of the subject area on 25 June 2008 by Nicole Davis and Laraine Nelson. The middens of immediate concern are known as M1, M2 and M3 and it was intended, if time permitted, to establish the nature and location of middens M4 through to M10.

6.1 Methodology

The location of the middens had been established by geo-referencing the coordinates provided by Silcox (Figure 4-1). A preliminary inspection of the sites was conducted in February 2008 by Darrell Rigby, Archaeology Manager, RPS HSO. An assessment and recommendation was provided in a desktop study to Great Lakes Council.

A review of the previous Silcox (1999) and ERM (2007) reports was augmented by a study of further archaeological reports and recorded sites in the northern Port Stephens area. A review of current literature on middens was also undertaken.

6.2 Strategy

The strategy was to visit each of the sites and determine if the middens were of human origin if this was determined then recording of:

- the nature of the midden
- the extent of the midden
- the accuracy of the recorded location

and subsequently AHIMS site cards completed (Appendix E).

6.3 Survey

The location of middens M1, M2, M3 was readily identified (Figure 6-1).

M1 was first identified in areas of exposure adjacent a drainage line (running north-east / south-west). Transects were then walked radiating from the drainage line. The boundaries were established through noting the disappearance of shell in exposures. The midden appears to be located on a low lying north-east/south-west mound that follows the above mentioned drainage line. It was noted that on the opposite bank of the drainage line no shell was visible however this may have been a result of dense ground cover hampering visibility rather than absence of shell.

M2 was located to the south of an east west running road. The midden material was on the north and south banks of a drainage channel that is either artificial or has been modified to improve flow.

M3 was located on the southern side of the same east-west road. It lay between two fence lines and straddled an unused track (north-south) once used to access Pindimar Bay on Port Stephens. The midden does not present as large as that described by Silcox, but, dense groundcover precluded any sight of the ground to the east of the north-south track.

M4 and **M5** were not satisfactorily located. The area identified as the site by GPS was covered by dense vegetation, there was no ground visibility and the understorey was so dense it made access virtually impossible. At M5 one small fragment of shell was observed but this is not sufficient to identify a midden.

TITLE: Figure 6-1
Location of Middens MRD1, MRD2 & MRD3
Myall River Downs, Tea Gardens

CLIENT: GREAT LAKES COUNCIL

PLANNING SURVEYING ECOLOGY

HARPER SOMERS O'SULLIVAN

SCALE: 1 : 4000 (A3)
DATE: 14th October 2008
DATUM:
ORIGIN:
DRAWN: E.Chesterson
APPROVED: D.Holloway
SURVEYOR:
CONTOUR INTERVAL: N/A
SHEET 1 OF 1
AUTOCAD REF: 24737-2A
LAYOUT REF: Middens
JOB REF: 24737

241 DENISON STREET BROADMEADOW PO BOX 428 HAMILTON NSW 2303
T: 02 4961 6500 F: 02 4961 6794 E: survey@rpshso.com.au W: www.rpshso.com.au ABN 11 093 343 858

7 RESULTS

M1

Location:
M1 is approximately 200 metres east of an extension of the tarred road, Settlers Way and the Hermitage Lifestyle Resort's Community Facilities Building. The midden runs parallel to a north-east / south-west drainage line. The estimated mid point of the midden is: MGA 56, GDA 94 - 419876E 6385890N.

Vegetation:
This is open forest with the majority of the area covered by dense grasses. No understorey vegetation.

Landscape:
The midden material is associated with a low rise (elevation ≈ 4 metres).

Disturbance:
This area has been subjected to land clearing in the past. The drainage channel that runs north-east / south-west and adjacent MRD1 appears to be either man made or is a natural channel that has been modified.

Appearance:
Shell, predominately cockle (*Anadara trapezia*) with fewer numbers of whelk *(Pyrazus ebeninus*) and some fragments of oyster (*Ostrea angasi*) appear in exposures and is most readily seen in the area adjacent the drainage line. A methodical inspection of exposures across the area reveals that the midden material appears to be in close association with the low mound. The shell density is low with most of the area having an average of around 4 fragments per square metre.

Dimensions:
Approx. 200 metres X 50 metres

Composition:
An estimate is that cockle (*Anadara trapezia*) comprises 90%, whelk *(Pyrazus ebeninus*) 9% and oyster (*Ostrea angasi*) <1%. Whelk was the only shell observed in the western extremity of the site. One stone artefact (Plates 6-8), a core, was observed adjacent the drainage line toward the eastern end of the observable midden.

Volume:
Not determinable.

Photographs: Appendix F. Photographs 1-8

M2

Location:
M2 is adjacent to and on the southern side of an unsealed road that appears as an extension of Settlers Way and is known as the Haul Road. The midden appears on the eastern and western side of a north south running drainage line. As the area is fenced for grazing, access was obtained though stock gates. The estimated mid point of the midden is: MGA 56 – GDA 94 - 419347E 6385769N

Vegetation:
This is an open forest with the majority of the area covered by dense grasses. No understorey vegetation.

Landscape:
The midden material is associated with a low rise (elevation ≈ 16 metres). The proximity of the midden to the all weather unsurfaced road may indicate that the immediate area has been raised as part of the road construction works.

Disturbance:
This midden has been considerably disturbed. An unsurfaced road runs on the midden's northern boundary and north-south through the site a drainage channel has been either excavated or modified with the additional insertion of a culvert to support the road.

Appearance:
Shell, predominately cockle (*Anadara trapezia*) with fewer numbers of whelk *(Pyrazus ebeninus*) and some fragments of oyster (*Ostrea angasi*) appear in exposures and is most readily seen in the area adjacent the drainage line. A methodical inspection of exposures across the area reveals that the midden material appears to be in close association with a low mound.

Dimensions:
Approx. 20 metres X 10 metres

Composition:
An estimate is that cockle (*Anadara trapezia*) comprises 80%, whelk *(Pyrazus ebeninus*) 20% and oyster (*Ostrea angasi*) <1%.

Volume: Not determinable.

Photographs: Appendix F. Photographs 9-18.

M3

Location:
M3 is adjacent to and on the southern side of an unsealed road that appears as an extension of Settlers Way and is known as the Haul Road. The southern side of the road is bounded by a stock fence with a second parallel fence approximately 10 metres away. A track runs south east from the Haul road toward Pindimar Bay through the midden site. The estimated mid point of the midden is: MGA 56, GDA 94 - 3418858E 6385766N.

Vegetation:
Apart from the sandy track the area is densely vegetated with predominately low ground cover, low to medium shrubs and some trees providing poor ground visibility.

Landscape:
A sandy flat area that appears to have no distinguishing features from the immediate area. It was noted that to the south of the second fence the track was inundated, indicating that the adjacent area was low lying.

Disturbance:
The visible area of this midden is seen on an unsurfaced track. The degree of disturbance to the remainder of the midden is difficult to ascertain given the poor visibility.

Appearance:
Only fragments of cockle (*Anadara trapezia*) were observed, scattered with no apparent clustering.

Dimensions:
Approx. 20 metres X 20 metres

Composition:
Cockle (*Anadara trapezia*) comprises 100%.

Volume:
Not determinable.

Comment:
Silcox, who had greater ground visibility than was available during this survey, records this as a midden. It would appear that while there is only sparse shell visible the dense vegetation particularly to the east of the sand track covers the majority of the midden site.

Photographs: Appendix F. Photographs 19 - 24

7.1 Archaeological Significance

Silcox provided the following assessment, dividing the subject area into three sensitivity zones – Low, Medium & High. A map was produced by Silcox depicting these zones and it is reproduced in Appendix 2. RPS HSO have geo-rectified this map to show the midden sites in a GIS, the results of which are displayed in Figure 4-1.

Highly Sensitive Areas are those sites on the southern and western margins of the subject area. These include the slightly elevated rise along the southern edge of the subject area and the edge of the terrace nearest to the estuarine environments of Kore Kore Creek and Pindimar Bay. These comprise parts of the lands marked for rezoning/subdivision known as the *Transitional zone* and the eight lot sub-division. Silcox suggested a curtilage of 30 metres from the edge of the existing wetlands as a buffer to ensure that the most likely occupation locations were preserved.

Silcox states that this zone should be *'excluded from any development planned for the area and preserved for future research'*.

Medium Sensitivity Areas are those potential sites formed by a series of rises along the central creek corridor and also include a ridge in the north-west corner of the subject area. Silcox states that this region should be excluded from development as much as possible. Yet, if development is to occur, a suitable archaeological test program of subsurface deposits is recommended prior to any development proceeding.

Low Sensitivity Areas largely comprise the rest of the subject area. The potential for archaeological material on the sand plain away from the wetland margins was considered low and subject to no archaeological constraints.

The sites M1, M2 and M3 occur within the area designated by Silcox as Highly Sensitive.

7.2 Cultural Significance

This refers to the value that Aboriginal places have to current day Aboriginal populations. It combines both a scientific and a social aspect.

Archaeologists tend in some cases to give scientific value to a place or places, often ignorant of the full spiritual and religious meaning. It is not the role of RPS HSO to adjudicate on what may or may not constitute a significant level of cultural value to Aboriginal Australians. Aboriginal Australians themselves are best placed to achieve this type of assessment. Members from the Karuah Local Aboriginal Land Council are best placed to comment upon what physical evidence or spiritual associations are of particular significance and cultural value to them. Aboriginal Australians may hold the view that the archaeological approach places too much weight on quantification and measurement and too little on culture (NPWS Aboriginal Cultural Heritage Standards & Guidelines Kit, 1997).

8 DISCUSSION

One of the main aims of this survey and report was to determine if the sites M1, M2 and M3 recorded by Silcox and detailed in the Parsons Brinckerhoff 2003 report were middens of indigenous human origin.

Shell middens comprise deposits of shell remaining from consumption discard and are common in coastal regions and along watercourses. Middens vary in size, preservation and content, although they often contain artefacts made from stone, bone or shell, charcoal, and the remains of terrestrial or aquatic fauna that formed an additional component to the Aboriginal diet.

In determining whether shell deposits are middens or natural deposits Attenbrow (1992: 3) considered shell deposits that are remote from their naturally occurring location should fall into the following criteria:

- in situ Aboriginal shell middens
- humanly redeposited natural shell bed material
- humanly redeposited Aboriginal shell midden material
- remains of meals of Europeans.

The following indicators were used in assessing M1, M2 and M3.

- Presence of Aboriginal cultural heritage material or food debris other than shell.

A stone artefact was found at M1. Neither M2 nor M3 had artefacts apparent. This is not unusual; the collection of stone artefacts is now illegal, yet in the past collectors targeted recognisable middens as a source of stone artefacts. Dyall (1980) indicated that a large number of stone artefacts from the area were housed in private collections. Food debris in middens is most often fish or bird bone found preserved in dense clusters of shell. Sparse scatters such as in M1, M2 and M3 provide little protection for such fragile material.

- Shellfish size and type.

Close proximity to water may indicate a natural source for shell. Natural shell deposits will exhibit a variation in size (small through to large) and reflect the range of shell type found in that environment. In contrast a midden will contain shell at the larger range of the species size (as small shellfish would not provide enough food to make their targeting worthwhile). Midden shell reflects the preferred shellfish type, in the bay area of Port Stephens area these were cockle (*Anadara trapezia*) whelk *(Pyrazus ebeninus*) and oyster (*Ostrea angasi*). These shellfish are all found on tidal mudflats.

- Location

M1, M2 and M3 contain shellfish species that are some distance from their source. While quantities of shellfish found away from their source may indicate a midden, other factors need to be discounted. Sand mining and extraction may result in the relocation of natural shell beds and midden material, as can natural geomorphic processes. Shell in the subject area does not have the appearance of having been relocated by modern activity.

Further information on shell middens may be found in Attenbrow (1992), Bowdler, (1983) and Meehan (1982).

With reference to the above criteria it was determined that as Silcox had stated M1, M2 and M3 were Aboriginal shell middens. In accordance with DECC requirements all three middens were recorded for inclusion on the AHIMS database. In recording the middens the three identified as M1, M2 and M3 were re-labelled with the identifying tags of MRD1, MRD2 and MRD3. This sets them apart from the remaining middens, M4 - M10 that are still not assessed and properly recorded.

The following Discussion and Conclusion will now refer to the middens as MRD1, MRD2, and MRD3.

With regard to the integrity of the sites it is considered that there had been disturbance at all three sites. MRD1 has a large drainage channel on its eastern margin, MRD2 is adjacent an unsurfaced road and has a drainage channel and cement culvert bisecting it, MRD3 has an unsurfaced road and track on its western and northern extent.

All three are part of an area that has been cleared, and according to Silcox, ploughed as part of pastoral improvement works for cattle grazing.

The sites MRD1 and MRD2 are within the proposed development zone.

MRD1 covers approximately 10,000 square metres and is associated with a low rise. While it appears that clearing and ploughing has occurred previously it is likely, that apart from the surface disturbance, the midden may be largely intact. It is considered that MRD1 should be afforded protection and assigned a level of High Significance on scientific grounds. It should be excluded from development and a suitably wide buffer zone should be established.

Of the three sites, MRD2 has been subject to the most extreme disturbance. The construction of a roadway, culvert and the drainage channel has resulted in severe disruption to its integrity and it is considered that other than recording its location, no scientific value can be attached to the site. Silcox (1999) recommended that any development proposed in areas designated as high or moderate archaeological sensitivity must incorporate a suitable program of archaeological subsurface investigations in conjunction with the relevant statutory permits (s.87 - Preliminary Research, Excavation Permit) to determine if any archaeological deposit is present. It is considered, following this inspection by RPS HSO, that little information of scientific value would be achieved by conducting sub-surface testing under an s.87 of this site. The most appropriate progression of work would be through an s.90 Consent to Destroy.

Overall Silcox (7.1 Archaeological Assessment) recommended that what is now the subject area be excluded from development, considering it Highly Sensitive. During the current survey it was noted that the nature of the land is low lying and prone to flooding. This is evident with a series of drainage channels both man made and natural through the area. With the sites found all located on slightly higher elevations it could be assumed that these were the target for repeated occupation while the lower areas were less favoured. It is considered the labelling of such a broad band as Highly Sensitive may be excessive when the survey by Silcox found the middens were localised. The conclusion of this report is that the middens recorded have been of significant size to remain visible even after pastoral activities. Smaller sites that may have been across the broader area would have been dispersed and as such

would only be observed now as isolated shell with little or no provenance. This report does not support Silcox's broad assignment of Highly Sensitive to the subject area.

9 RECOMMENDATIONS

The survey conducted by RPS-HSO confirmed the finding by Silcox (1999) that a series of Aboriginal cultural heritage sites, middens, existed in the subject area. The middens assigned the prefix M1, M2 and M3 by Silcox were visually assessed and as part of the recording process for the DECC are now re-labelled MRD1, MRD2 and MRD3.

If the proposal by Crighton Properties Pty Ltd for an eight lot rural subdivision is to progress the following recommendations apply:

- Consultation with the local Aboriginal community with a view to developing an Aboriginal Cultural Heritage Management Plan for the overall subject area should occur. This Plan will facilitate long term protection of sites with incorporation into the Draft Community Management Statement and Principles Community Title Scheme. To ensure that this Plan is effective annual inspections should be conducted by the proponent in conjunction with KLALC.

- MRD1 is assessed as Highly Significant. It is located within an area proposed for an eight lot rural residential subdivision. MRD1 should be excluded from development and as such particular reference should be given to MRD1 in the development of the Cultural Heritage Management Plan. Its protection should be given high priority and include the establishment of an appropriate buffer zone.

- Site MRD2 is within the proposed development area of Crighton Properties Pty Ltd. It is considered that this site is highly disturbed and as such is considered to have little scientific potential. On these grounds if the development progresses it will be necessary to lodge with DECC a Section 90 *Consent to Destroy* application.

- MRD3 is outside the development area proposed by Crighton Properties Pty Ltd and should not be impacted on. However it is important that during any earthworks or construction activity that MRD3 IS afforded a sufficiently wide protection zone to ensure no impact occurs.

In addition:

- Should works uncover or disturb suspected archaeological material, work should cease immediately and the DECC and KLALC advised so that a suitable management strategy can be determined.

- If human remains are uncovered or disturbed all activity in the specific location must immediately cease, the remains should not be disturbed or moved, and the Police and the DECC notified.

- During development at locations in proximity to known archaeological sites, appropriate fencing should be erected and clearly marked as 'No Unauthorised access' area. Workplace protocols should include a description of the sites location and document appropriate work behaviour when operating near to archaeological sites.

With regard non-Indigenous cultural heritage works may progress with regard the following:

- If, during the course of clearing work, significant non-Indigenous cultural heritage material (for archaeological items it is those exceeding 50 years in age) is uncovered work should cease immediately. The NSW Heritage Office should be notified and works only recommence when an appropriate and approved management strategy instigated

10 REFERENCES

Australian Bureau of Meteorology. www.bom.gov.au

Attenbrow, V. 1992 Shell bed or shell midden. *Australian Archaeology*. Vol 34. pp.3-21

Bairstow, D. 1993. With the best will in the world: Some records of early white contact with the Gampignal on the Australian Agricultural Company's estate at Port Stephens. Aboriginal History. Vol.17. No. 1 pp. 4-16

Bowdler, S. 1983. Sieving shells: midden analysis in Australian archaeology. In G. Connah (ed.) *Australian Field Archaeology – A guide to techniques*. pp. 135-144. Australian Institute of Aboriginal Studies. Canberra.

Brayshaw, H. 1988. Archaeological survey at Tea Gardens, NSW. Unpublished report to Planning Workshop for Condux Development.

Dallas, M. 1982. Waterview Estate Canal subdivision, Tea Gardens: Survey for archaeological sites. Unpublished report to Frost and Associates.

Dawson, R. 1831. *The Present State of Australia*. Smith Elder and Company. London.

Dean-Jones, P. 1989 Report of an archaeological survey of a caravan park site at Tea Gardens Port Stephens, NSW. Unpublished report to Envirosciences.

Dyall, L. 1971-1980. Port Stephens – North Side Aboriginal Sites. Unpublished manuscript.

ERM, 2007. Resolution of Deferred Matter - Great Lakes SEPP (amendment 44) and Statement of Environmental Effects.

ERM, 2007a. Riverside at Tea Gardens. Aboriginal Heritage Assessment. Unpublished Report to Crighton Properties.

Fairly, A. & Moore, P. 1989, *Native Plants of Sydney District, Identification Guide*. Kangaroo Press. Sydney, NSW.

Great Lakes Heritage Study. 2003. Draft report to Great Lakes Council

Kinhill Engineers. 1994. An archaeological assessment of the shell midden site no. 38-5-0147, Tea Gardens, NSW. Unpublished report to Crighton Properties Pty Ltd.

Laffan, J. & Archer, C., 2004, *Aboriginal Land use at Tocal – the Wonnarua Story*, NSW Agriculture.

Meehan, B. 1982. *Shell Bed to Shell Midden*. Australian Institute of Aboriginal Studies. Canberra.

Morgan, G. 2001. Delineation and description of the Eastern Environmental Subregions (provinces) in New South Wales Study. NSWNPWS, Hurstville, retrieved July 23 from;
http://www.environment.nsw.gov.au/bioregions/SydneyBasin-Subregions.htm

Murphy, C. L. 1995, *Soil Landscapes of the Gosford-Lake Macquarie 1:100 000 Sheet Report,* Department of Conservation and Land Management.

Parsons Brinkerhoff, 2003, Local Environment Study, Myall River Downs, Vol. 1.

Robinson, L. 1994. 2nd edn, *Field Guide to Native Plants of Sydney*, Kangaroo Press, Australia.

Scott, W. 1923, The Port Stephens Blacks. Recollections of William Scott. Edited by Gordon Bennett.

Silcox, R. 1999, Archaeological Assessment for proposed rezoning of Part Lot 1 DP834986 and Part Lot 2 DP233635, Myall River Downs Tea Gardens.

Sokoloff, B. 1973. The Worimi: Hunter Gatherers at Port Stephens. Unpublished Bachelor of Arts thesis. Newcastle University.

Tawse, D & Hudson, A. 1998 *The Guiding Light in Port Stephens Heritage*, Nelson Head Lighthouse & Rescue Station Reserve Trust.

Troedson, A., Hashimoto, T.R., Jaworska, J., Malloch, K., Cain, L., 2004. New South Wales Coastal Quaternary Geology, 108pp. In NSW Coastal Quaternary Geology Data Package (on CD-ROM), Troedson, A., Hashimoto, T.R. *(eds)*, New South Wales Department of Primary Industries, Mineral Resources, Geological Survey of New South Wales, Maitland.

APPENDIX A Parsons Brinckerhoff Report

- on land steeper than 18° some management practices are impossible, and all become difficult. In addition, the environmental consequences of ground clearing (erosion) may not be acceptable; and
- on steeper slopes the canopy fuels are more readily available to a fire, cancelling out the advantage of having an Outer Protection Area.

Accordingly, developments abutting such slopes should be located so that both the Asset Protection Zone and the development are not located on slopes steeper than 18 degrees.

Areas Proposed for Future Subdivision

To ensure that asset protection zones can be incorporated at the subdivision/ development stage, a draft LEP for the study area should ensure:

- zoning boundaries are of sufficient area and shape to allow for the establishment of Asset Protection Zones within all future allotments; and
- Asset Protection Zones do not encroach into environmentally sensitive areas; and
- building allotments and perimeter and access roads meet the specifications outlined in *Chapter 4* and *Appendix 3* of the *Planning for Bushfire Guidelines (2001)* document.

This should be accompanied by appropriate development standards for minimum lot sizes, dwelling density, building lines and minimum setback distances.

3.6 Heritage

Parsons Brinckerhoff commissioned consultant archaeologist Rex Silcox to undertake an assessment of the Aboriginal and European archaeological values of the land. The study had the following objectives:

- determine whether any sites, relics or locations of indigenous or European historic significance occurred in the study area;
- assess their potential scientific and cultural significance; and
- formulate appropriate strategies for their future management in relation to their likely significance, statutory requirements and the nature of the proposed development of the area.

Comprehensive details of the results of the investigation are contained in *Appendix D*. A summary is provided below.

3.6.1 Non-Indigenous Heritage

European History

The first Europeans to enter the Great Lakes District were assigned convicts engaged in cedar cutting in 1816. In 1824, the Australian Agricultural Company selected an area of 500,000 acres which extended north of Port Stephens as far as the Manning River and west to Stroud.

The Company engaged in a variety of agricultural and pastoral ventures, but few of these were commercially successful. Eventually, in 1832, the coastal strip was surrendered to the crown in exchange for land on the Peel River at Tamworth.

A number of small settlements arose in this area, associated with various industries such as timber getting, boat building, farming, fishing and mining. The Tea Gardens area remained part of the Company territory until 1856, when the Company began to dispose of its holdings. Around Tea Gardens, land was often let in the form of extended leases, for cattle runs. However, soon after 1906, when legislation was introduced to make rates payable on unimproved land, most of the remaining Company land in the Tea Gardens area was also sold.

The village of 'Myallton' (that is Tea Gardens) was laid out as a Company settlement in 1866, while the settlement of Hawks Nest was set out by the NSW Government about the same period. The first land grants in the Tea Gardens/Hawks Nest area were made in 1865. The urban area for Tea Gardens/Hawks Nest was officially gazetted in 1921.

The allotments for the settlement of 'Limestone' on the margins of Wobbegong Bay at the southern edge of the study area, were set out in the 1890s. A Company map from 1854 shows a 'shell bank' at the location of the later settlement. At that time the Company was leasing the area to limeburners who would have been burning shell (either natural remains or Aboriginal shell middens) to produce lime for cement.

By the late 1880s, the timber industry had declined and the population was also diminishing.

Sand mining began in the 1960s. A punt service to connect Tea Gardens and Hawks Nest began in 1928, to be replaced by the existing 'Singing Bridge' in 1974.

The study area was once part of a larger block of 3,248 acres which extended from the Limekilns Road north to the parish boundary at Viney Creek. In 1908, this land was sold as Lot 35, parish of Combewah to Patrick Hough, a member of the Hough family who had purchased considerable amounts of property in the Tea Gardens area.

European Heritage

Despite the long history of European activity in and around the study area, the survey found no European structures or items of historical significance.

3.6.2 Indigenous Heritage

Context and Background

A search of the National Parks and Wildlife Service Site Register showed that a total of 49 sites had been listed in an area extending west–east between Carrington and the coastline, and south–north between Port Stephens and the Bombah Broadwater. Many of these sites had been recorded during systematic surveys for various commercial or government developments, but many were also the result of accidental discovery by local residents. Detailed information on the contents and context for many of these sites is minimal. It is likely that many sites have been destroyed or obscured through natural processes or pastoral usage and the development of the urban landscapes of Tea Gardens and Hawks Nest.

Research in the Port Stephens-Myall River region, and in the Newcastle Bight to the south, has been sufficient to allow a moderate level of prediction of the likely nature and distribution of the archaeological resource in the current study area. Shell middens were the most common site type, accounting for 35 (70 percent) of the total number of sites. They included a midden associated with a burial and a midden associated with axe grinding grooves. A range of other sites were represented in the area, consisting of five open camp sites, four burial sites, a scarred tree, a bora/ ceremonial ground with a carved tree, a natural mythological site, a stone arrangement and a fish trap.

On the basis of these relative site frequencies, it could be predicted that the sites most likely to be found during surveys in the region would be middens, concentrated mainly on the shoreline of Port Stephens and along the coastline, the margins of wetlands, estuarine creeks and the Myall River Valley. A range of other site types may also occur. Open campsites, consisting of surface scatters of artefacts, might be found on elevated, well-drained landforms where suitable conditions of exposure and visibility exist.

Existing Archaeological Knowledge and Previous Investigations

In the Tea Gardens area, a number of estuarine middens have been recorded around the margins of the lakes and swamps along the Lower Myall River and bays and creek mouths along the northern shoreline of Port Stephens (for example National Parks and Wildlife Service Site Numbers 38-5-18, 38-5-56, 38-5-44, 38-5-41). Most of these shell deposits are relatively shallow, ranging from a few centimetres to a depth of 30 centimetres, and occur in disturbed contexts. There appears to be only limited amounts of stone material or other archaeological evidence present.

Several middens have also been recorded on the beach and dunes north of Hawks Nest (for example 38-5-19 and 38-5-24) and at North Head (Yacaaba). These coastal middens contain open ocean beach and rock platform shellfish, as well as some estuarine shell. Many of the middens were extensive, although poorly preserved. A midden complex at Dark Point (Dyall 1975) contained evidence of fishing and, although focussed primarily on marine resources, also contained bones attesting to the exploitation of various terrestrial mammal and bird species. The range of habitats (coastal, estuarine, wetlands, forest) represented in this area would have been a rich source of food and probably supported a large Aboriginal population.

Survey Findings

Figure 3.12 shows the location of archaeological sites derived from the survey.

The survey recorded a total of ten (M1-M10) formally designated midden sites, consisting of diffuse variably dense scatters of whole and shell fragments with occasional flaked stone artefacts. All sites were found at the edges of the cleared component of the study area, mostly on the margins of the SEPP 14 wetlands on Kore Kore Creek or adjacent to the marshy lowlands which extend beyond the SEPP 14 wetlands along the southern edge of the study area. No sites were found on the sand plain away from the wetlands margins, and no evidence of shell had been revealed during the excavation of the sand mine in the north-east of the study area (G Cox pers comm).

Sites M1, M2, M3, M4 and M5 were widely spaced along a low rise which extends along the edge of the swampy terrain on the northern side of the SEPP 14 wetlands. The rise is highest at its eastern end, sloping gradually to the west over a distance of roughly 300 metres to form a low, diffuse undulating surface which continues along the margins of the wetlands to the west for a distance of about two kilometres.

Whole shells and shell fragments were scattered in a variable density along most of the rise, mostly as a sparse scatter or occasional fragment but with higher densities of shell fragments exposed at a number of locations. Due to the clearing activities and consequent disturbance of much of the sandy surface, these scatters occurred in heavily disturbed contexts where the disturbance from the clearing had often resulted in widespread displacement and dispersal of the original shell concentration. The extent of the main site could only be approximately defined due to the disturbance that had occurred. It was possible that the disturbance had impacted only on upper shell layers and there was potential for some depth of intact shell deposit to have survived below the present ground surface.

However, the distribution of the main shell concentrations was interpreted as representative of a variable but widespread occupation of the wetlands margin.

To the east of the central creek, the understorey vegetation had been widely cleared from the rise and the adjoining sand plain, resulting in widespread disturbance of the ridge surface to a depth of at least 10 centimetres. The ground surface was currently covered by an understorey layer dominated by bracken, with a sparse ground layer of various grasses and low herb species. The recent construction of a haul road which runs along the northern side of the rise to the east of the central creek has disturbed and obscured part of the original topography and drainage pattern along the wetlands margins. Several shallow, open drains have been excavated across the sandy flats and through the ridge, to allow water from the flats to drain southwards into the wetlands.

To the west of the central creek, the clearing process appeared to be much more recent and the degree of regrowth of bracken was much less, resulting in much greater exposure of the sandy surface and higher visibility.

Sites M6, M7, M8 M9 and M10 were located along the western edge of the study area, on the edges of terraces and on creek flats bordering Kore Kore Creek and the western creek. These locations had also been heavily disturbed by the clearing of vegetation and shell fragments were scattered intermittently across the ground surfaces between the site concentrations.

At each site, all of the complete shells and shell fragments belonged to three species of shellfish commonly found in middens formed near estuarine mudflat environments. These species were:

- Mud whelks (*Pyrazius ebeninus);*
- Sydney cockle (*Anadara traezia);* and
- Rock oyster (*Crassostrea commercialis).*

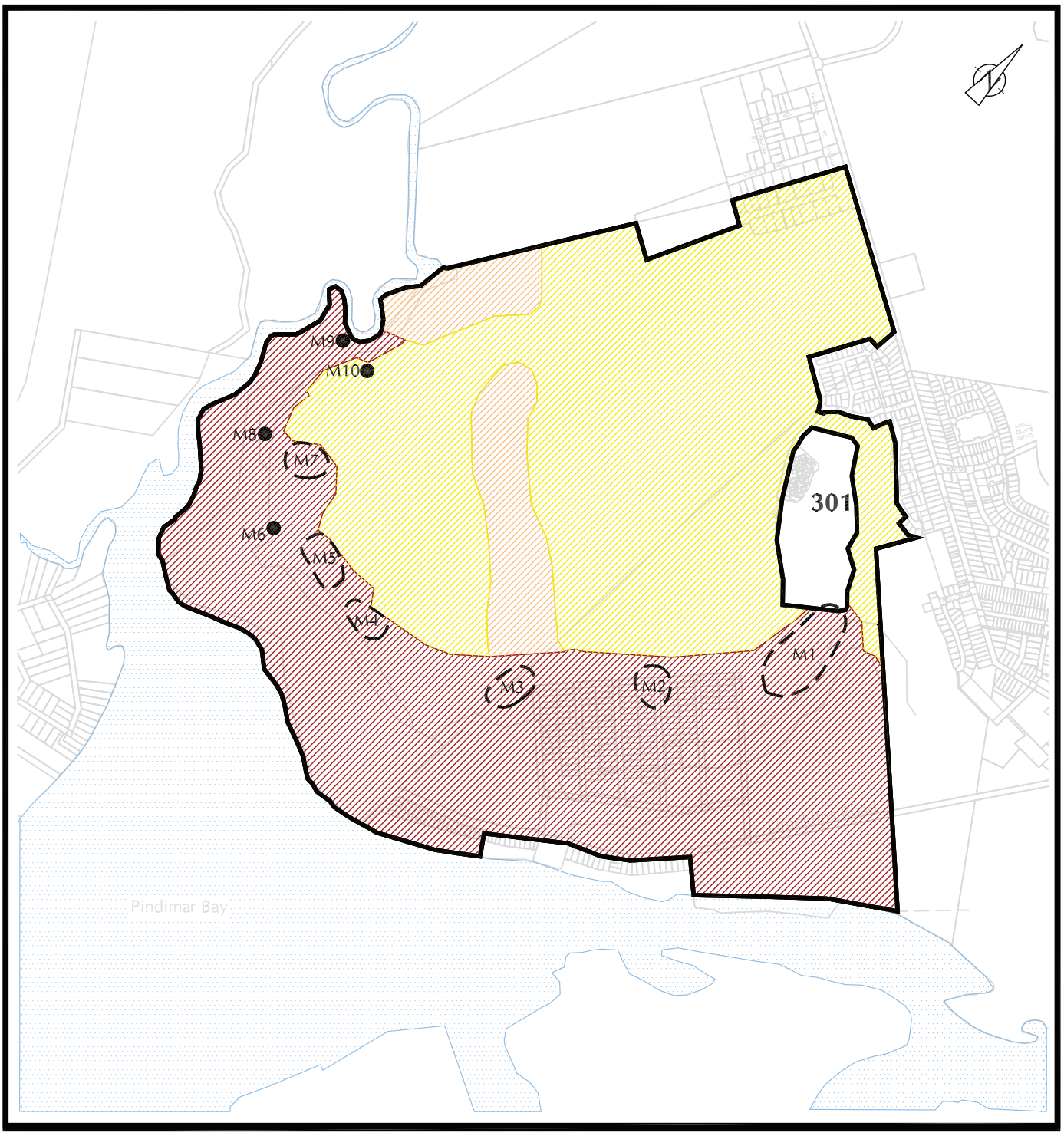
Due to the widely dispersed nature of the shell scatters, it was not possible to determine accurately the relative proportions of these species in the shell assemblage. Mud whelks and Sydney cockles, due to their stronger structure, often occur in a relatively intact condition, although somewhat weathered. Rock oysters, because of their laminar structure, tend to decay and disintegrate more readily into small fragments, and may have been under-represented.

A summary of archaeological findings is contained in *Table 3.11* and the location of the findings is shown in *Figure 3.12* of the local environmental study.

Table 3.11: Surveyed Indigenous Sites

Site	Site Type	Topographic Location	Site Environment	Site Area	Site Condition	Visibility
M1	Shell midden (dispersed)	Sandy rise beside wetlands	Open eucalypt woodland; bracken understorey; variable grass and herb ground layer	200 metres x 50 metres along top of rise	Disturbed by clearing of native vegetation and shallow ploughing	Variable (20 to 70 percent) for 200 metres to west from eastern end of rise, reducing to very low (<5 percent)
M2	Shell midden (dispersed), flaked stone artefacts	Sandy rise beside wetlands	Open eucalypt woodland; bracken understorey; variable sparse grass and herb ground layer; intermittent vegetation litter	North of haul road, sparse shells in 30 metres x 15 metres on both sides of drain; south of haul road most shells in 10 metres x 3 metres on west side of drain; sparse shells over 50 metres x 10 metres along east side of drain	Site area and surrounding surface disturbed by clearing of native vegetation, shallow ploughing, drain excavation and construction of haul road	High (50 to 80 percent) for 80 metres north from haul road and 15 metres on both sides of drain; visibility on adjoining littered surface much lower (10 to 20 percent); south of road visibility high (70 to 90 percent) on both sides of drain
M3	Shell midden (dispersed), flaked stone artefacts	Sandy rise at junction of central creek and wetlands	Open eucalypt woodland; sparse bracken understorey; intermittent vegetative litter	North of haul road, most shells and artefacts in 20 metres x 20 metres blow-out; occasional shells on adjoining rise up to 10 metres west from blow-out; south of haul road, most shells in 10 metres x 3 metres on rise	Site area and surrounding surface disturbed by clearing of native vegetation, shallow ploughing, wind erosion and construction of haul road	Highest (<95 percent) across blow-out, reducing to 40 to 70 percent on surrounding surface due to disturbance and litter
M4	Shell midden (dispersed)	Gently undulating sandy terrain beside wetlands	Open eucalypt woodland; sparse bracken understorey; intermittent vegetative litter	Shells scatters in low to moderate density over 40 metres x 30 metres	Site area and surrounding surface disturbed by clearing of native vegetation and shallow ploughing	Low to moderate (20 to 40 percent) across site location due to disturbed sandy surface and litter
M5	Shell midden (dispersed)	Gently undulating sandy terrain beside wetlands	Open eucalypt woodland; sparse bracken understorey; intermittent vegetative litter	Shells scattered in variable density for over 150 metres east-west along fenceline at edge of wetlands and up to 50 metres inland from the fence; slightly higher density of shells in area of 80 metres x 30 metres	Site area and surrounding surface disturbed by clearing of native vegetation and shallow ploughing	Low to moderate (20 to 40 percent) across site location
M6	Shell midden (dispersed), flaked stone artefacts	Both banks of western creek, 300 metres from Kore Kore Creek	On north bank, west of track cleared and covered by short grass; east of track is forest with dense understorey of lantana/long grass; on south bank, track runs through forest with dense understorey	On north bank, shells and artefacts in 4 metres x 3 metres in track cutting; occasional shells spread for 30 metres north along track; on south bank, sparse scatter of shells on 5 metres x 5 metres sand spoil heap	Disturbed by track cutting through creek banks, traffic on track, clearing of vegetation and bulldozing activity	On both sides of creek, visibility along track moderate to hight (30 to 70 percent) for over 100 metres; visibility low (<20 percent) west of track, very low (<5 percent) east of track
M7	Shell midden (dispersed)	Gently undulating sandy terrace bordering western creek	Cleared pine plantation; open eucalypt woodland with dense bracken understorey; variable carpet of vegetative litter	Sparse shell scatter over 120 metres x 50 metres	Site area and surrounding terrace disturbed by clearing of pine plantation and understorey vegetation, plus shallow ploughing	Low to moderate (10 to 40 percent) across site area and on adjoining terrace; visibility nil in adjoining forest

Site	Site Type	Topographic Location	Site Environment	Site Area	Site Condition	Visibility
M8	Shell midden (dispersed), flaked stone artefacts	Edge of sandy terrace overlooking Kore Kore Creek	Cleared pine plantation; open regrowth eucalypt/pine woodland; bracken understorey with various regenerating plants (*Acacia, Kennedia* spp)	Sparse shells and occasional artefacts scattered over 50 metres x 30 metres along fenceline at edge of terrace	Site area and surroundings terrace disturbed by clearing of pine plantation and understorey vegetation, and shallow ploughing	Moderate to high (30 to 70 percent) across site area and on surrounding terrace
M9	Shell midden (intact)	Edge of sandy terrace overlooking Kore Kore Creek	Cleared pine plantation; open regrowth eucalypt/pine woodland; bracken and grass understorey; dense carpet of pine needles and slashed lantana and bracken stems	Low rise of 10 metres x 10 metres; shells visible in roots and small fallen trees	Site appeared undisturbed; adjacent terrace disturbed by clearing of pine plantation and shallow ploughing	Very low (<5 percent) on site location and on adjacent terrace
M10	Shell midden (dispersed)	On low gradient slope to Kore Kore Creek	Cleared pine plantation; open regrowth eucalypt/pine woodland; bracken and grass understorey; carpet of pine needles	Sparse shell scatter over 20 metres x 10 metres	Site area and surrounding slope disturbed by clearing of pine plantation and understorey vegetation, and shallow ploughing	Low to moderate across site (20 to 40 percent), reducing to 10 percent on adjacent slope



Project No: 2116143A Cadfile No: L118F3_12 View: MSview1 Rev: D Date: 29/08/2003

Study Area Boundary
Low Sensitivity
Medium Sensitivity
High Sensitivity
(M) Midden Site

200 0 200 400 600 800 1000
Metres

301 Lot 301, DP881950 excluded from study area of LES

Archaeological Sensitivity
Figure 3.12

3.6.3 Archaeological Site Significance

The ten midden sites found during the survey consisted of sparse scatters of whole shells and shell fragments occurring on sandy surfaces with moderate to high surface visibility but low archaeological visibility due to the highly disturbed condition of the site locations. The amount of information available for an assessment of the site's significance (for example the integrity of the site location, the nature and extent of the site's contents, the potential for subsurface deposits) was generally limited, due to the amount of disturbance and displacement of the site material.

It is likely that occupation was almost continuous along the wetlands margins, resulting in a series of 'base' camps at specific locations, where settlement and discard of shells was concentrated, separated by stretches of landscape with a lower occupation intensity and a lower shell discard rate. Intensive occupation would probably have taken place around the junctions of the creeks and the wetlands, where several resource zones were readily available.

All sites occurred in a variably disturbed contexts resulting from recent clearing of vegetation. M6 occurred at a creek crossing, on an unsurfaced road cutting through both banks. At several sites (M5, M6, M7, M8 and M9), there was some potential for the visible shell scatter to extend beyond the existing site area into adjacent, more heavily vegetated ground where visibility was much less.

The range of shells at each site was limited to three species, all commonly found on estuarine mudflats and typical of estuarine middens. The limitations of the surface examination, combined with the amount of disturbance, prevented a complete assessment of the range of subsistence activities that may have taken place. Although the survey found no other forms of evidence (for example of other subsistence activities such as fishing) or evidence of the exploitation of any of the range of other prey species available, the highly disturbed and dispersed nature of the site locations may have destroyed or obscured small amounts of more delicate evidence for example fish bones. It is possible that only the more resistant shells have survived, or that other evidence is still present but remains buried in older deposit.

If the original shell deposit was shallow, that is less than 30 centimetres, the visible shell scatter may represent the entire site deposit now completely dispersed on the surface. However, if the original shell deposit was deeper than the zone of disturbance, then the visible shell scatter may represent only the upper layers of the deposit and there may be intact deposit with research potential surviving below the disturbed zone.

A small number of artefacts were recorded from several of the sites, although it is possible that more artefacts were present at those sites then were seen during the survey. All artefacts were made of similar material, fine grained volcanic tuff. The majority of the artefacts were unmodified flakes, broken flakes and flaked pieces, all smaller than three centimetres maximum dimension, several retouched artefacts were also found in terms of artefact types and raw materials, the artefacts were all consistent with the assemblages found at other sites in similar environmental contexts in the vicinity of Tea Gardens, all dated to a mid-late Holocene age.

The sites as recorded were therefore of limited scientific significance, due to the limited range of evidence and their highly disturbed context. However, the shell scatters may be the surface indicators of subsurface shell deposit which has survived in an undisturbed context. A more detailed investigation of the sites would require some degree of excavation which would also enable comparison of these sites with other excavated midden sites in the area, for example the sites north of Tea Gardens. It may also be possible to examine the geomorphological processes involved in the formation of the site locations, as well as investigate the relationship of these processes to the cultural processes involved in the formation of the site.

Although surface visibility was limited over most of the study area, due to the disturbed state of the surface and/or the leaf/bark litter, the level of disturbance and visibility was similar across most of the landscape. The differential discovery of evidence, that is almost all evidence was restricted to the wetlands margin, demonstrated a widespread Aboriginal presence in this landscape. The concentration of archaeological evidence was not a function of the degree of visibility but a real reflection of the prehistoric settlement pattern. The available evidence suggests that the sites were probably smaller 'base' camps associated with the exploitation of a limited range of estuarine wetlands resources.

The almost complete absence of evidence on the terrain away from the wetlands suggests that the plain was not occupied to any significant extent. While Aboriginals probably traversed the area during hunting trips to the hilly hinterland, no part of the study area is more than 2.5 kilometres (probably half to three-quarters of an hour walk) from the 'base' camps adjoining the wetlands. Most of the travel between the study area and the rugged country to the north was probably via the ridge in the north-west corner and along Kore Kore Creek. There was probably little incentive for long term camping on the sandy plain, although some short term camping may have taken place along the central creek as suggested by the isolated artefact IF1 found next to this creek.

3.6.4 Heritage Constraints and Management Issues

The study area can be divided into three zones of varying levels of archaeological significance and research potential, with specific management strategies. The zones were designated as follows:

- highest archaeological sensitivity: on the basis of its research potential this zone should be excluded from development;
- medium archaeological sensitivity: exclusion from development preferred, however, if development is to proceed a program of subsurface investigation is required; and
- lowest archaeological sensitivity: no archaeological constraints to development.

The demarcation of these zones was somewhat arbitrary and the zones tend to grade into each other. Identification of the zones was based on the highest density of surface archaeological material and the greatest potential for the survival of intact deposit with potential for further research.

The extent of the three zones is indicated in *Figure 3.12*.

It is emphasised that the surviving material evidence of Aboriginal occupation along the east coast of NSW is increasingly under threat from a range of developments and it is necessary that appropriate measures should be undertaken to ensure that archaeological relics are not disturbed or destroyed by construction activities before they can be adequately assessed. Under the terms of the *National Parks and Wildlife Act (NSW) 1974 (Section 90[1])*, it is illegal to knowingly destroy, deface of damage any Aboriginal relic or place without the written consent of the National Parks and Wildlife Service Director.

3.7 Visual and Scenic Quality

3.7.1 Methodology

An assessment of the visual assessment and landscape characteristics of the study area was undertaken together with an analysis of any likely subsequent change in these characteristics as a result of future development. Consideration was given to cumulative visual and landscape impacts arising from other developments surrounding the study area. The assessment undertaken in this study is based on the methodology outlined below:

- landscape description and assessment, comprising topography, vegetation types, waterways;
- viewer characteristics, comprising viewpoint analysis, distance and sensitivity zones; and
- impacting activities, comprising a description of impacting activities, adjacent activities and the cumulative impact.

This methodology is used to identify landscape management zones and determine visual quality objectives. The existing character of the study area was then assessed for its level of sensitivity to land use and development.

Assessment Criteria - Visual Quality

The study area has been broken into five broad landscape units taking into account slope, vegetation type and landscape cover. The landscape units are:

- flat low lying land (vegetated and cleared);
- hills;
- water bodies;
- urban elements; and
- areas of land use disturbance.

The basic premise of visual quality assessment is that all landscapes have some value, but those with the highest diversity have the greatest potential for high scenic quality.

Scenic quality is an assessment of the combination of elements used to identify the importance of the proposed development to potential viewers. The assessment of scenic quality ranks the landscape units in scenic quality classes, for example, high, medium and low. These classes are

Appendix D

Heritage Report

Appendix D – Heritage Report

D.1 Methodology

D.1.1 Method and Scope

Parsons Brinckerhoff, formerly PPK Environment & Infrastructure Pty Ltd, commissioned consultant archaeologist Rex Silcox to undertake an assessment of the Aboriginal and European archaeological values of the land. The study had the following objectives:

- determine whether any sites, relics or locations of indigenous or European historic significance occurred in the study area;
- assess their potential scientific and cultural significance; and
- formulate appropriate strategies for their future management in relation to their likely significance, statutory requirements and the nature of the proposed development of the area.

An inspection of the study area was carried out over several days in late November 1999, by Rex Silcox accompanied by Carl Simms, a representative of the Karuah Local Aboriginal Land Council.

D.1.2 Archaeological Survey Methodology

The archaeological survey was carried out by the archaeologist and the Land Council representative walking systematically across approximately 80 percent of the study area outside the SEPP 14 wetlands. Most of the area had been cleared of its original understorey vegetation, leaving open woodland. In places, a variably sparse understorey dominated by bracken had regenerated, but most of the ground was covered only by a thin carpet of vegetative debris remaining from the clearing process.

The survey closely examined the margins of the study area nearest the wetlands of Pindimar Bay and Kore Kore Creek, where midden sites would be most likely to occur. The survey also examined the margins of the three natural creeklines but visibility was often limited due to dense vegetation or the disturbed ground surface covered by vegetative litter. A number of transects were followed across the central portion of the study area, to examine the more elevated surfaces of the central beach ridge and the knolls on either side of the central creek. However, due to the generally disturbed ground surface and/or the carpet of vegetative litter remaining from the clearing operations, overall archaeological visibility was reduced.

Although the SEPP 14 wetlands occupy a substantial portion of the study area, it was considered that, due to the dense vegetation covering the zone and low visibility, and its existing protected status, survey of this zone was not warranted.

D.1.3 Information Sources

The primary source of background information on indigenous heritage was the National Parks and Wildlife Service Head Office Sites Register which contains reports on systematic surveys in the Tea Gardens area as well as site forms containing information on each site found and recorded.

Preliminary background information on the non-indigenous heritage in the area was obtained by reference to the heritage/planning officer of the Great Lakes Council, the Council's Local Environmental Plan, including the Hunter Regional Environmental Plan and the NSW Heritage Council register.

Information on the Australian Agricultural Company which has long been active in the Tea Gardens area was derived from research carried out by Dr P. Pemberton in records contained in the Noel Butlin Archives Centre, ANU, Canberra.

D.2 Non-Indigenous Heritage

D.2.1 European History

The first Europeans to enter the Great Lakes District were assigned convicts engaged in cedar cutting in 1816. In 1824, the Australian Agricultural Company selected an area of 500,000 acres which extended north of Port Stephens as far as the Manning River and west to Stroud.

The Company engaged in a variety of agricultural and pastoral ventures, but few of these were commercially successful. Eventually, in 1832, the coastal strip was surrendered to the crown in exchange for land on the Peel River at Tamworth.

A number of small settlements arose in this area, associated with various industries such as timber getting, boat building, farming, fishing and mining. The Tea Gardens area remained part of the Company territory until 1856, when the Company began to dispose of its holdings. Around Tea Gardens, land was often let in the form of extended leases, for cattle runs. However, soon after 1906, when legislation was introduced to make rates payable on unimproved land, most of the remaining Company land in the Tea Gardens area was also sold.

The village of 'Myallton' (that is Tea Gardens) was laid out as a Company settlement in 1866, while the settlement of Hawks Nest was set out by the NSW Government about the same period. The first land grants in the Tea Gardens/Hawks Nest area were made in 1865. The urban area for Tea Gardens/Hawks Nest was officially gazetted in 1921.

The allotments for the settlement of 'Limestone' on the margins of Wobbegong Bay at the southern edge of the study area, were set out in the 1890s. A Company map from 1854 shows a 'shell bank' at the location of the later settlement. At that time the Company was leasing the area to