NEW ZEALAND ARCHAEOLOGICAL ASSOCIATION

ARCHAEOLOGY IN NEW ZEALAND

OMAHA BEACH, STAGE 1: PRELIMINARY ARCHAEOLOGICAL REPORT

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Introduction

The Omaha Beach development is a residential subdivision on the southern half of the Omaha sandspit, 12 km north east of Warkworth, about an hour's drive north of Auckland. The sandspit encloses the Whangateau Harbour, which is fed by the Omaha River and the Waikokopu Creek. The sandspit is composed of a series old beach ridges and eroding dunes and prior to development was largely in dairy pasture.

The area is divided into 5 Neighbourhood Units, and development is phased to occur over several years. This paper reports on the archaeological investigation of sites uncovered during Stage 1 earthworks between July and December 2000 (Campbell *et al.* 2001). This involved development of Neighbourhood Units (NU) 4 and 5 at the southern end of the sandspit and preparation of an access road.

Eight archaeological sites had previously been recorded in the development area. A 1997 survey (Clough 1997) located and recorded 45 more sites, only one of which was confidently identified as one of those previously recorded (R09/208). All sites recorded were shell middens of varying size and condition, many typically deflated by wind erosion. Although midden is the predominant site type on the sandspit, the spit and harbour are surrounded by six headland pa and numerous other settlement sites.

Owing to the shifting nature of the dune environment it was accepted that many more sites would be exposed during earthworks, and an application to modify unrecorded archaeological sites was lodged with the Historic Places Trust. An authority (No. 1998/141) was granted under Sections 14 and 15 of the Historic Places Act (1993).

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Traditional History and Land Use

The coastal area and offshore islands of the outer Hauraki Gulf were valued for their rich marine life, particularly shark, which was preserved by drying, as well as fish and shellfish. The large expanse of estuarine mud flats in the Whangateau Harbour would have been a particularly rich source of shellfish. A wide range of natural resources could be procured from the swamps and forests near Omaha, and Great Barrier Island provided a source of obsidian. Good quality agricultural soils were available locally, and cleared land would have provided a source of edible bracken fern.

The traditional history of Omaha is part of the larger history of the coastal area between Mahurangi and Te Arai Point, and indeed of Northland, Auckland and Hauraki. Originally the Omaha sandspit and surrounding area was occupied by Ngai Tahuhu who traced their descent from Tahuhunui, commander of the Moekakara or Te Whakatuwhenua canoe that landed near Goat Island. Around the 1620s a group of Ngati Awa migrated north from Kawhia led by Maki and his brother Mataahu. A battle was fought between Ngai Tahuhu and Maki's people at Pukenihinihi Pa to the southeast of the Omaha sandspit, and Ngai Tahuhu were defeated. It was around this time that the descendants of Maki and Mataahu became known as Kawerau and came to occupy the land from Takapuna to Te Arai Point and the Gulf Islands as far north as Hauturu (Little Barrier Island). The descendants of Maki's son Manuhiri became Ngati Manuhiri, and settled the area between Whangateau and Pakiri (Auckland Regional Council Parks [ARC] 1992).

In the 1820s Kawerau found themselves under threat from the musket armed Ngapuhi. Ngapuhi were defeated in battle at Mahurangi in 1820, where their leader Koriwhai was killed. Two years later they sought to avenge this death, attacking Kawerau at Te Kohuroa (Mathesons Bay). After the initial attack Ngapuhi retired to the Omaha sandspit where fires were lit. The next day there was another brief engagement from which Ngapuhi emerged victorious (ARC 1992).

In 1825 Kawerau aided Ngati Whatua in battle against Ngapuhi at Mangawhai and then at Te Ika a Ranganui near Kaiwaka. Despite heavy losses Ngapuhi emerged victorious. Kawreau lost many warriors and fear of further attack caused them to to leave their homes. Ngati Manuhiri sought refuge north ofWhangarei with their Ngati Wai relataives (Pritchard 1983). In 1839 a 10,000 acre block, which included the Omaha Sandspit, was sold to William Webster, an American trader, who purchased the land from Hauraki tribes rather than the

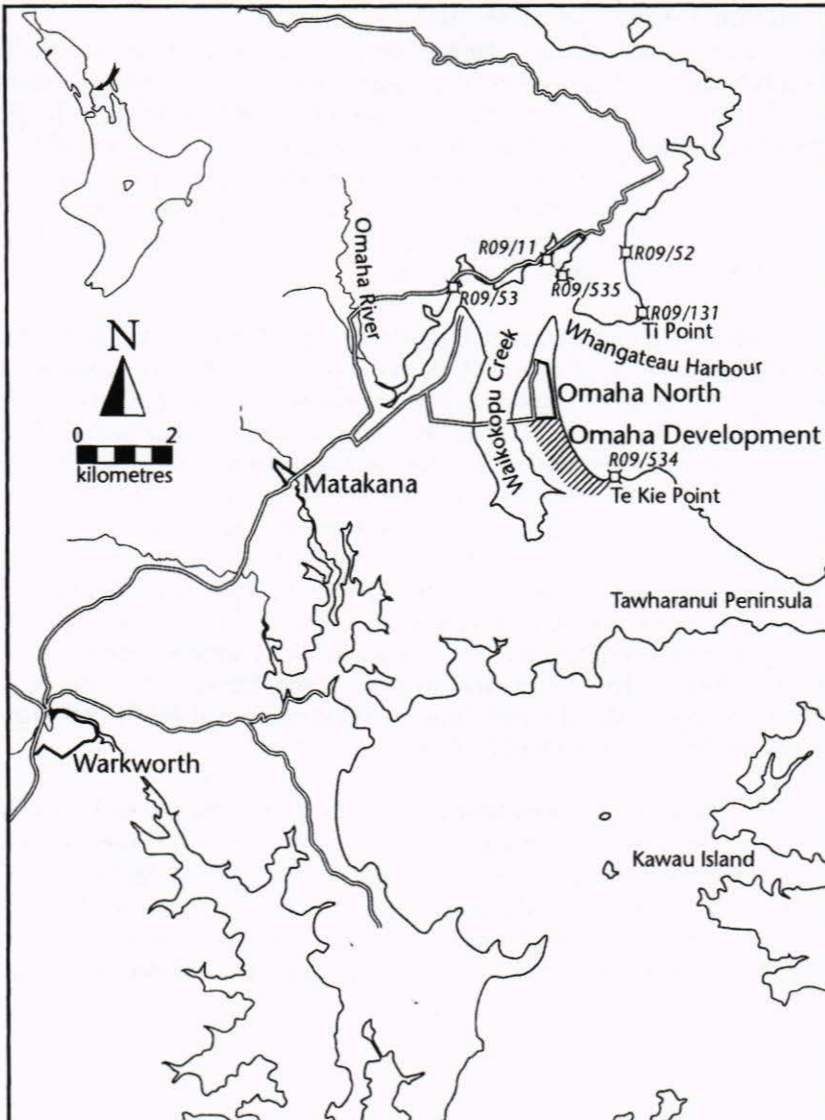

Figure 1. Location of Omaha Sandspit, including a number of recorded pa in the vicinity.

traditional occupants. In 1844 Webster's claim was found to be excessive, though he was granted a smaller holding on the northern side of the Whangateau harbour. Meanwhile a large tract of land known as the Mahurangi Purchase stretching from Takapuna to Te Arai Point was purchased by the crown from Ngati Paoa and Ngapuhi (ARC 1992).

Hearing of the land sales the Kawerau people began returning to their land unimpeded by the Crown. Chief Tawhiti lived on the Omaha sandspit prior to 1865 when he moved to the flats nearby. Land sales continued in the area and in the 1870s the Maori Land Court heard claims to the Mangatawhiri block. This particular block had many claimants and it was agreed that it should be divided into three. Mangatawhiri No 1, essentially Omaha sandspit, was granted to Kawerau for sale (ARC 1992).

Mangatawhiri No 1 was sold to John Atkinson of Dunedin, and subsequently passed through a number of hands. Its various owners exploited their holdings for timber and firewood, and subsequently mined sand and shell for the cement industry – two activities that have impacted directly on Omaha sandspit.

The Geomorphology of Omaha Sandspit

The sandspit encloses the Whangateau Harbour, with alluvial and estuarine sediments forming tidal mudflats to the west, and dune sands to the east (Tonkin & Taylor 2000). Basement rocks consist of indurated sandstones (greywacke) and mudstones of the Waipapa group (of Jurassic origin, 150–120 million years ago), and more recent sandstones of the Waitemata group (Miocene, 12–16 million years ago) (Harrison Grierson 1999: 1). The sandstones outcrop at Te Kie Point, while the greywacke to the south of the site was quarried in historic times.

The dune system is relatively stable, with a tendency to accretion balanced by major episodes of storm induced erosion (Tonkin & Taylor 1998: 2). This stability cannot necessarily be projected back into prehistoric times, but it seems likely that the dunes have been fairly stable for some time. This would indicate that middens and the spit in general will be well preserved, although individual dunes have been subject to wind deflation.

An 1874 survey plan shows remnant forest on the west and north east of the sandspit, with fern and manuka covering the rest. A 1934 plan indicates that the forest had been cleared and light manuka covered about half the spit. These cycles of forest and bush clearance would have exacerbated dune deflation.

The Dune System

The dune system falls into three distinct areas. NU 5 along with the southern half of NU 4 comprises flat ground that rises gently to the west, from a natural drainage path behind the beach dunes, about 2 m to a low ridge approximately 600 m long. Although this area is relatively flat, a series of poorly differentiated beach ridges relating to coastal accretion could be observed. The land then drops away to kahikatea swamp and the Waikokopu Creek. This low lying area is generally damp, especially in winter, though drier to the west. In the northern half of NU 4 and the southern half of NU 3 the dunes are less stable, and probably younger than elsewhere. Very few middens were observed in this area. In NU 1 and 2 and the northern half of NU 3 a series of well defined dunes run parallel to the beach. These dunes are older and more stable, and generally correspond to the prehistoric dunes. Some newer dunes probably originate with historic period land clearance.

The Archaeology of Omaha

Earthworks involved levelling of dunes to the north and infilling of low lying areas to the south. Most of this work was carried out by 15 m^3 motor scrapers, with limited use of backhoes. Middens were investigated as they were exposed. Smaller middens and isolated oven scoops tended to be fully exposed, though usually damaged, by the first pass of the machine. Large middens not fully exposed were carefully stripped with a 10 or 20 tonne backhoe and weed bucket, to remove any remaining sand overburden and expose the surface of the midden.

157 middens were recorded, and since it was impractical to thoroughly investigate them all, sampling was carried out based on an assessment of significance. Criteria for assessing significance included size, depth, density and homogeneity of the deposit, presence or absence of features or stratigraphy, and relationship to other sites or landforms. Less significant middens, usually fairly homogenous with few features, were described and sketch mapped. More significant middens containing numerous features, usually evidence of cooking in the form of oven scoops, were accurately planned and extensively sampled. Some were trenched or sectioned with the backhoe in order to examine the profile more closely, others were test pitted by spade. After this investigation was complete the midden was removed with the backhoe, and any remaining features in the base were then planned.

All recorded middens were located by hand held GPS receiver at an accuracy of 2–5 m. This allowed accurate maps to be made using a GIS (MapInfo). As the project progressed a standard data recording sheet was developed to allow consistent comparison between middens, and this data was also entered into the GIS.

Sites were numbered using an internal numbering system (i.e., OMH120), since it is hardly productive to assign an NZAA site number to every midden, particularly when most have been destroyed. We view this complex of middens as a unitary landscape, and at the conclusion of the project all middens will be incorporated into a single site record. Estimates of the volume of each midden deposit were made. These are only rough calculations, based on the dimensions of each midden, estimated average depth and estimated density of shell. The resulting figure is useful for making comparisons, but should not be regarded as accurate.

General Stratigraphy

Middens were generally located over a substrate of yellow sand, which underlies most of the spit. The colour of this sand comes from the presence of organic material, clay and/or staining from limonite (iron salts) (Harrison Grierson 1999). Closer to the water table the yellow sand becomes a gleyed beige colour, and would seem to have been waterlogged for the greater part of the year. At the southern end of the subdivision, especially in NU 5, this gleyed sand formed the substrate for some of the larger middens.

Old dark topsoil horizons were located at varying depths beneath and within more recent wind deposited sand. These are usually only about 50–100 mm thick, and are often incorporated into the upper midden layers. Much of their colour comes from a general scatter of fine charcoal across much of the subdivision, especially at the northern end, in addition to humic material. This charcoal may originate with the middens and food preparation, but may also be associated with historic vegetation clearance of the spit for agriculture.

Some of these old horizons are quite compact, and extend around many of the larger middens at the northern end of the subdivision. These would appear to be living or activity surfaces, but no features or artefacts were observed in association with any of them. Compacted horizons were not so commonly observed in the southern half of the subdivision. This would seem to be related to the size of the middens and intensity of occupation.

Associated with many of the larger middens was a disturbed soil of lenses and inclusions of topsoil, white and yellow sand, charcoal and shell. This often underlay the main midden deposit and extended around it for up to 20 m or more. This soil is certainly associated with human activity, but it does not appear to be a garden soil. It is not strongly mixed, as it would be if it had been deliberately dug over. One possibility is that it was associated with site preparation by a small group of people ahead of a larger gathering, and results from vegetation clearance, site levelling and the preparation of small amounts of food.

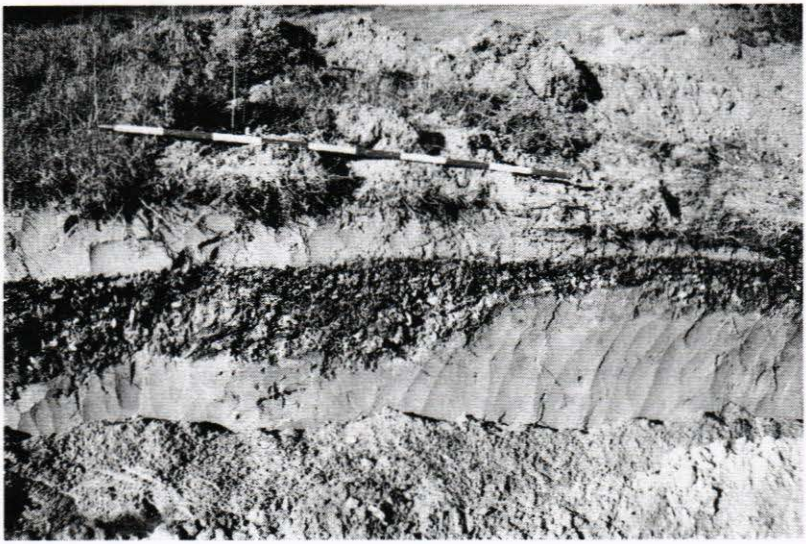

Figure 2. Typical midden stratigraphy, with yellow sand below and white sand above the shell deposit.

Above the yellow sand more recent wind deposited white sand was observed at varying depths, sometimes as quite high dunes of 3 or 4 m. Most middens were preserved by being sealed beneath white sand and topsoil, but many have subsequently been exposed and are actively eroding.

Most middens consisted entirely of shell, and tended to be discrete deposits. Along the flat areas of NU 4 and 5 middens tended to be more dispersed, with a thin scatter of shell over the whole area between concentrations. This probably relates to ploughing in historic times or quarrying of shell and sand deposits. Oven scoops were often visible at various levels. These contained charcoal, some heat cracked stones, shell and very occasionally fish bone. No other faunal material has been observed to date. Most middens are fairly dense and homogenous. Often patches or lenses of particular shellfish species were observed.

The midden sand matrix often incorporated the old topsoil horizon, and in NU 4 and 5, where sites were close to the surface, modern topsoil. In many places scrub clearance in recent times appears to have removed or dispersed the topsoil, if it ever existed in any quantity in the first place. Most often the matrix was a dense black, and in the larger middens to the north this often appeared rather greasy, indicating the preparation of fat rich foods, but also related to intensity of occupation and dune stability. Towards the southern end of the spit this greasiness was not observed. Since the northern end was recorded during winter the greasiness may also relate to the dampness of the soil at the time. In many sites shell was very dense with very little sand matrix. This shell tended to be whole and very clean.

Figure 3. Oven scoop cut into the base of midden deposit.

Three types of hangi stone were observed, none of which are native to the dune system. The most common of these was the Waipapa greywacke, a rock of rather poor quality that seems to have shattered quite readily when heated. Another rock type used was water rolled river or beach cobbles. These were not common, though some of the larger middens contained them in some numbers, and some were quite large (>300 mm). Many were often whole, though some had fractured. These rocks were not observed on the beach, and must have been imported — given the size of some presumably by canoe. The final type of stone was the Waitemata sandstone, which seems inevitably to have heat fractured and subsequently degraded. The nearest source is seen eroding out of the rock shelf below Te Kie Point, and is found along the beach at the southern end of the spit. It was most commonly found in middens towards the south of the subdivision, but occurred throughout. Often hangi stones were observed in clear association with oven scoops or rake out, but were also spread throughout the deposit.

All sites located were either shell middens or isolated ovens scoops. The middens range dramatically in size, with the smallest representing the remains of a meal cooked and consumed by one or two people, through to very large deposits. For example, site OMH072 contained an estimated 100 m^3 of shell. Middens were generally fairly homogenous with pipi (*Paphies australis*) dominating the species composition. A few middens contained significant proportions of cockle (*Austrovenus stutchburyi*) or scallop (*Pecten novaezelandiae*) up to 5 or 10% in many deposits, rarely more than 50% but mostly these, and others, were minor species.

Many middens, particularly the larger ones, contained some limited stratigraphy in the form of various lenses of shell, differentiated by species composition, condition (burnt, fragmented, whole and clean, etc.), and type and consistency of matrix, along with lenses of oven rake out. In addition, oven scoops were cut into the midden at levels ranging from the base to the surface. These were often clustered into general cooking areas. Lenses and layers of disturbance associated with occupation and site use were also visible in places. However, what is notably lacking is any evidence of reoccupation of sites, with clear delineation of stratigraphy. Each midden seems to represent a single episode of occupation and deposition, though some of these episodes might represent an occupation of some weeks or even months.

Site Distribution

Site distribution falls neatly into three separate areas reflecting the division of the dune system noted above. The largest sites are predominantly in the northern half of the subdivision in NU 1 and 2 and the northern half of NU 3. The dunes here were drier and offered more shelter than the flat area to the south, particularly in winter. Low stable dunes were capped with dense shell, though often beneath a buildup of white windblown sand, up to 1 m, and occasionally 3 or 4 m, deep. Numerous small and medium sized middens and oven scoops were located on the top and on the slopes of dunes and in the hollows between

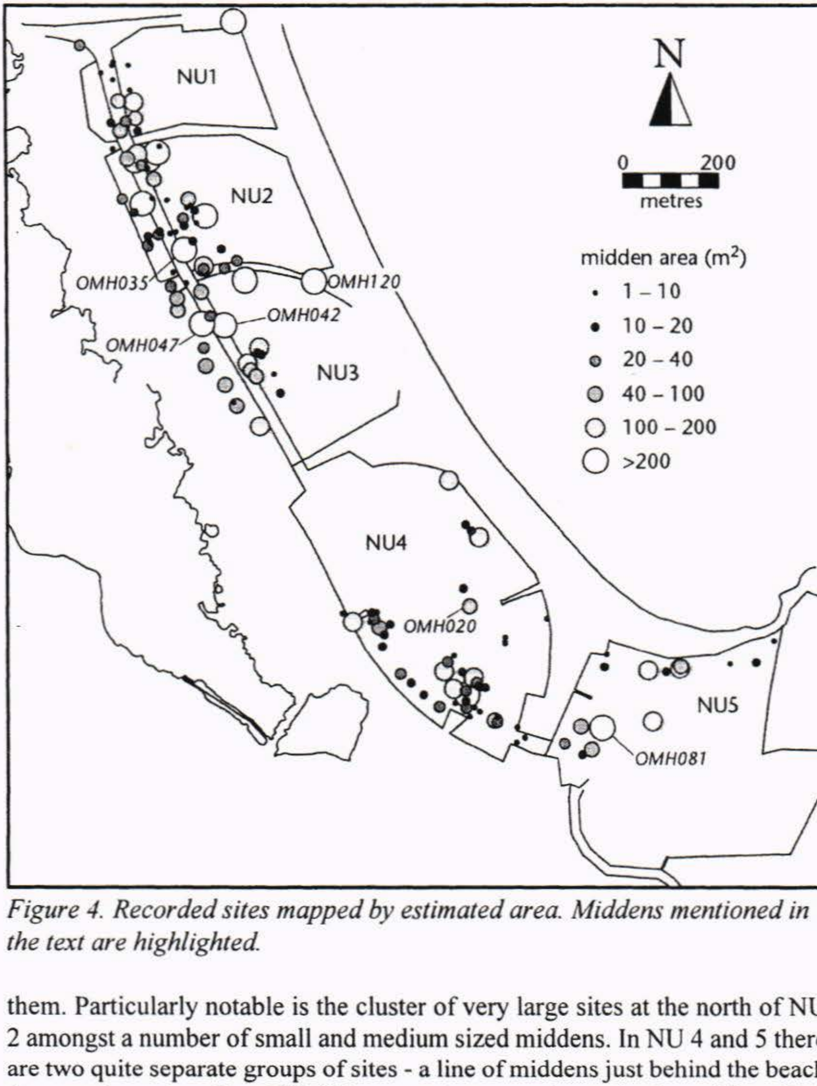

Figure 4. Recorded sites mapped by estimated area. Middens mentioned in the text are highlighted.

them. Particularly notable is the cluster of very large sites at the north of NU 2 amongst a number of small and medium sized middens. In NU 4 and 5 there are two quite separate groups of sites - a line of middens just behind the beach dune and another line 200-300 m to the west along the low ridge. This distribution may be explained by taking the seasonal occupation of the spit into account. Closer to the beach dune the spit is quite damp in winter, and middens located here indicate a summer occupation. On the other hand the low western ridge is drier, and middens here may indicate a winter occupation, with food carried further from the beach in order to find a dry spot for cooking and consumption. Most of the middens in both these areas are of small to medium size. The largest site here is OMH081, which at 30 x 30 m is as extensive as many sites in NU 1 and 2. This site lies directly above the gleyed beige sand, and could only have been occupied during a dry season.

In the southern half of NU 3 and the northern half of NU 4 very few sites were located. The four middens along the eastern edge of this area were all located beneath white sand. It is likely that many middens remain at a lower level, covered by white sand, in a distribution similar to that in NU 4 and 5. Alternatively, sites here may have deflated and been destroyed in the past as the dune system moved, but it seems unlikely that such a process could have destroyed all midden evidence in this area. Another explanation is that middens in this area were quarried for the cement industry, as suggested in the historic records.

Examples

Some sites were examined more closely than others because they were larger and more complex, containing numerous features, evidence of cooking or evidence of stratigraphy. Three examples are given here, and OMH047 is described in the midden analysis section, but it should be noted that these are not necessarily typical middens. These middens demonstrate the range of activities going on at Omaha, but also demonstrate that this range was quite restricted.

OMH035

This midden is a typical example of a large midden, with a cooking area consisting of a number of oven scoops, rakeout and burnt and fragmented shell contained within a greater mass of shell (Figure 5). An oven scoop was sectioned, revealing lenses of burnt sand within the midden fill, indicating episodes of rake out and reuse.

Adjacent to the oven was shell that had clearly been exposed to exceptionally high temperatures, since it had converted to lime. This lime was clean and white, the sand beneath was heat stained for some depth, and the midden next to it was very burnt and fragmented. It is not clear precisely what process caused this lime to form, but the absence of any roots in the lime or root stains above it indicates that it may not be connected with historic scrub clearance. This is the only such instance of limed shell observed.

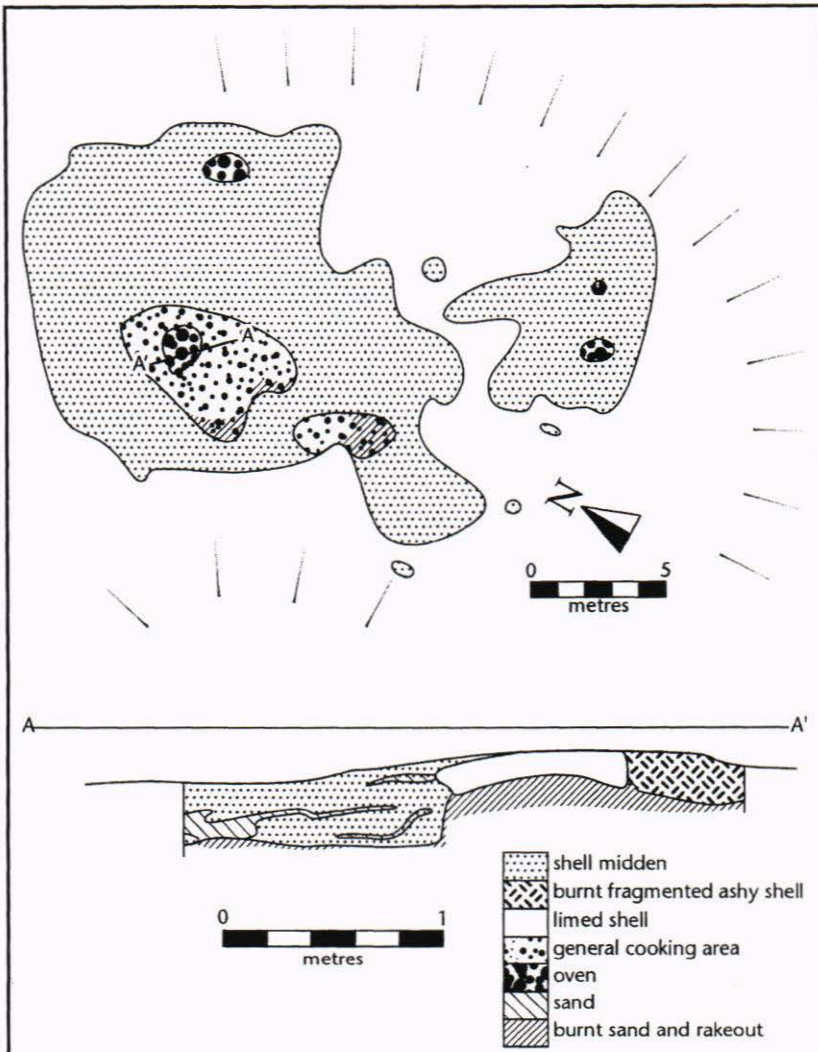

Figure 5. OMH035 in plan and excavated profile.

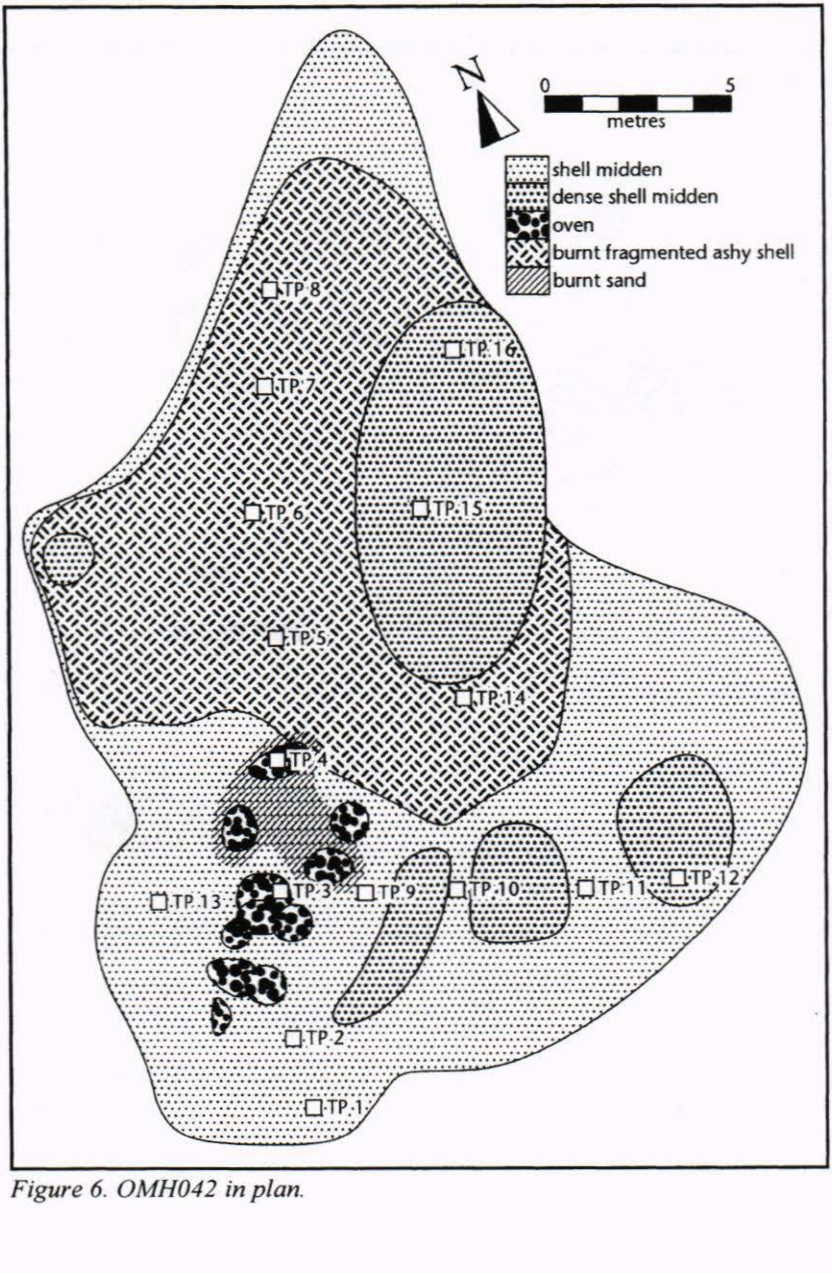

Figure 6. OMH042 in plan.

midden of varying density. Test pitting in this midden revealed that the midden round test pits 3, 4, 5, 9 and 10 was underlain by the disturbed anthropogenic soil already described.

OMH120

This very large midden is located in the phase 2 area of the subdivision, but was examined because it was, and continues to be, actively deflating (Figure. 8). A small adze (Figure 7)and a number of obsidian flakes, from both Great Barrier and Mayor Islands, and pieces of worked bone were located on the deflated midden surface. The adze is a reworked type 2B adze of Tahanga basalt. This is the only midden on the sandspit so far that contains any such material, all of which were found on the deflated surface where shell was no longer present. The bone artefacts are made from the bone of a small sea mammal (either a seal or a small whale). It seems likely that this animal was either captured or became beached and was subsequently butchered at the site using obsidian for flensing, and perhaps the adze for jointing. Some of the bone was subsequently worked, but the artefact or artefacts made have broken and the remnants are insufficient to indicate what type of artefact was manufactured. This is the largest midden yet located (80 x 50 m). Even at the most conservative estimate of average depth (100 mm), it is still more than three times as large as any other midden. It is possible that it is made up of several middens together, but given that it is largely destroyed by deflation there is no way of knowing this for sure. Subsurface charcoal was obtained for dating, but it remains to be seen whether this unusual site relates to a different time period to the other middens on the spit.

Figure 7. OMH120. The adze is in front of the trowel in the right foreground.

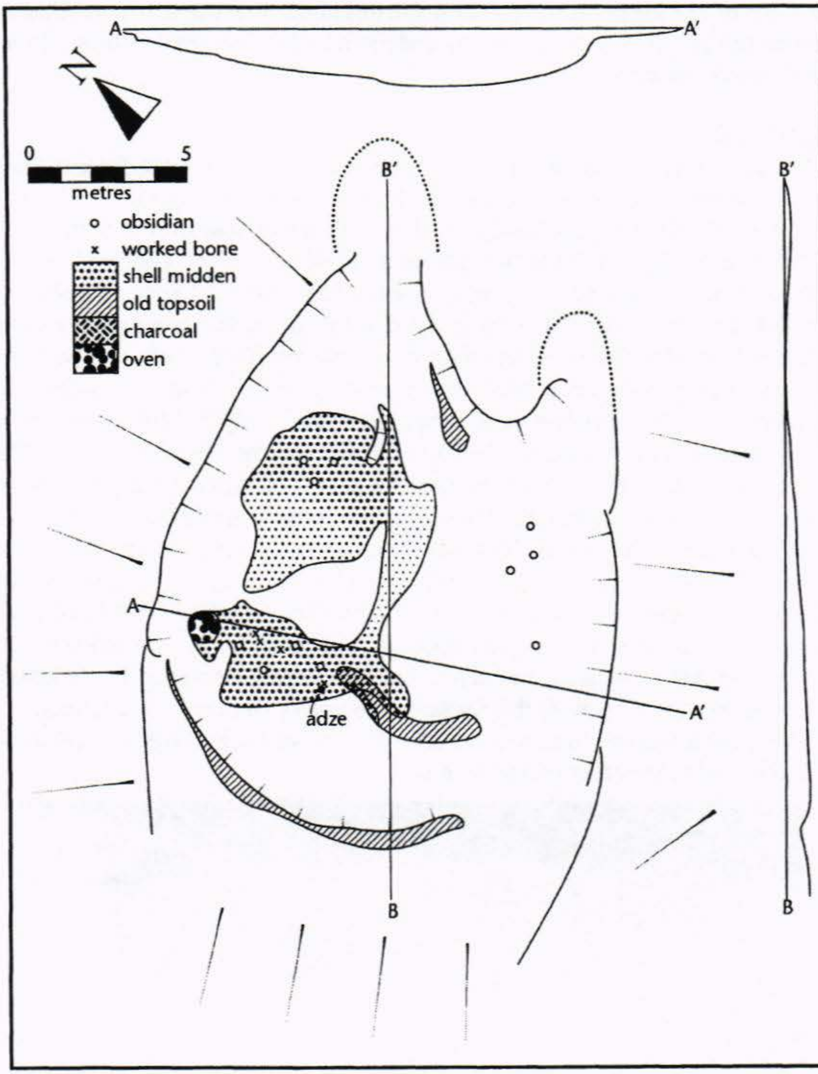

Figure 8. Part of OMH120 in plan and surface profile. The midden is exposed by deflation and the sand is blowing out at either end.

Faunal Remains and Midden Analysis

In the field the species composition for each midden was estimated and recorded. In addition a number of middens, and features and test pits within them, were systematically sampled. Most samples filled a 5 litre ziplock plastic bag, although on occasion, where a specific feature or lens was sampled, these could be smaller.

Prior to sieving the samples were examined to determine the composition and basic characteristics of each, recording features such as the colour, texture, size, and composition of the midden material and matrix The samples were then wet sieved through 5 mm and 2.5 mm screens, dried and sorted, with shellfish, fish bone and charcoal being separated out.

Shellfish

Shellfish were identified and counted to species level (Table 1). Counts were based on complete hinges of bivalves and terminal whorls of gastropods. Identification based on the left and right hinges was considered impractical and minimum numbers for bivalves were calculated simply by division of the total number of whole hinges by two for each species. Species identification was based on Parkinson (1999).

In the majority of middens pipi predominated, and cockle was the next most common species, reflecting field observations. Other less common species included ostrich foot (*Struthiolaria papulosa*), mud whelks (*Cominella* sp.), tuatua (*Paphies subtriangulata*), mudsnail (*Turbo smaragdus*) and scallop. Scallop, owing to its large size, would have had a greater relative meat weight than count alone would indicate, but the analysis considers numbers only. Many of the less common species, as well as those that occur only rarely, would have constituted a bycatch.

Pipi, the predominant species, can be found in both sandy beach and estuarine habitats, so on its own it cannot tell us which habitats were being exploited. If pipi is discounted the picture becomes more varied. The estuarine habitat, represented by cockle, predominates in a narrow majority of middens, with the beach habitat, represented primarily by scallop and tuatua, dominant in the remainder, but nearly all middens indicate exploitation of both habitats, as well as occasionally the rocky shore habitat.

The exception to this general rule is OMH020, which was a unique scallop midden. It is possible that the scallop were specifically targeted for a feast for a specific occasion. They may have been gathered from the beach after a storm had washed them ashore, or have been collected during low tides.

Fish

Fish bone analysis followed a method adapted from that outlined by Leach (1997). Fish bone was sorted according to anatomical element, with dentaries, articulars, quadrates, maxillas and premaxillas retained for species identification and counting, and vertebrae retained for counting only. Identifications of elements were carried out using the comparative collection at the Anthropology Department, University of Auckland. Species identifications follow Paulin *et al.* (1989).

Fish bone was not commonly observed in the middens. Of a total number of 80 samples from 28 middens analysed, only 41 samples from 17 middens contained fish bone. A number of samples deliberately targeted fish bone, so that even this small quantity over-represents fishing at Omaha. Table 2 contains a summary of identified fish bone from these samples. The most numerous identified species is mackerel (*Trachurus* sp.), for which a total MNI of 17 was obtained. Five barracouta (*Thyrsites atun*), five snapper (*Pagrus auratus*), one kahawai (*Arripis trutta*), one red gurnard (*Chelidonicthys kumu*) and one unidentified species of Carangidae (trevallies) were also identified. All these species may be caught on a trolling lure, or in the case of snapper, gurnard and trevally, with a baited hook. Mackerel may also be netted, particularly at creek mouths as they run with the tide (Best 1977: 53). In general, however, there are too few fish to say anything meaningful about fishing methods.

It is surprising that there are so few fish given the very large amounts of shellfish observed and the obvious marine focus of subsistence. Fish may be caught quite easily at Omaha today, and no doubt more easily in the past, indicating a subsistence strategy that either did not target bony fish, or preparation or preservation techniques that resulted in few bones being left on site. Netting fish is often a community activity with large quantities of fish being caught, so it seems unlikely that large scale netting was carried out at Omaha. Mackerel are the most common species, and it seems likely that they were targeted by netting on a small scale. Fishing overall seems only to have been a sporadic activity, and not central to the main use of the spit.

Generally there are fairly high quantities of vertebrae discarded alongside the identifiable mouth bones, indicating that whole fish were consumed on site. If fish were processed for preservation and later consumption elsewhere, then unusual ratios of vertebrae to mouthparts might be expected, reflecting different body parts being treated and transported differently. However, Best (1977: 54) notes that often fish were preserved with their heads still on. The small quantities of fish found at the site therefore do not argue conclusively against preservation. Shark and ray species were targeted for preservation along this general area of the east coast, but their cartilaginous skeletons tend not to preserve well. Shark teeth have not been identified to date. The analysis is so far unable to answer questions about shark preservation at Omaha.

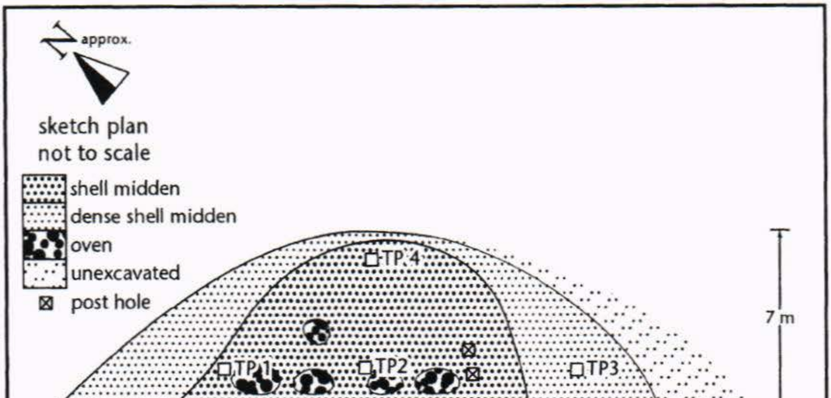

Figure 9. OMH047 in plan.

The exception to this general pattern is the fish bone from OMH047 (Figure 9), which contained a small, dense deposit of very fine fish bone. Half the deposit was sampled, and only a small proportion was analysed, perhaps 10% of the entire deposit. This revealed only one species of unidentified fish and a single mackerel scute. The fish bone here is very small and represents either an unknown juvenile or small species of fish, almost certainly netted. An MNI of 17 was obtained for this species, indicating somewhere between 150 and 200 in the whole deposit. One explanation for the deposit is that it is the stomach contents of a large fish, but no bones from such a species were recovered. Also body parts are differently represented. A total of 83 mouthparts were identified, but only 33 vertebrae. These were neither particularly fragile nor difficult to identify, so the most likely explanation is differential treatment and transportation of body parts. The sample was taken from the base of an oven scoop, and two postholes were observed close by. The postholes were straight sided in profile, but in plan oval or subrectangular. They were evidently not cut with an iron tool, and were probably driven into the soft sand. These may be evidence of smoking or drying racks, and in combination with differential treatment of body parts are the only indication that some sort of fish processing was being carried out at Omaha, with heads being discarded and bodies processed and preserved, but the evidence is circumstantial, and may as easily indicate a specialised method of food preparation.

Discussion

Most of the middens from which fish bone was recovered were relatively large and complex. In almost all cases fish bone was recovered in middens that contained evidence of cooking, often in direct association with oven scoops and rakeout. The small numbers indicate that fishing was a peripheral, opportunistic activity within the wider context of shellfish exploitation. Shell is so much more numerous than fish that it is clear that shellfish exploitation was the main subsistence activity carried out at Omaha. However, the traditional history relating to shark fishing along this coast cannot be overlooked. The analysis indicates that both beach and estuary were targeted, and that pipi and cockle from the estuary were exploited more regularly. The estuarine environment would have more extensive shellfish beds than the beach, and is a more sheltered environment, facilitating easier collection. Occasional other species, such as scallop or oyster, could also be specifically targeted, but exploitation of minor shellfish species seems to be an activity in the same class as fishing – a peripheral activity carried out when the opportunity presented itself, within the context of pipi and cockle gathering.

Charcoal and Environment

25 charcoal samples from six middens were identified to species level. Over half of the total charcoal comes from only two species, pohutukawa and puriri. Pohutukawa occurs on most shorelines irrespective of the wider vegetation types so this tells us little of the local vegetation pattern. Puriri is a tree that survives vegetation clearance and persists on landscapes where other forest species have long been removed. Given that other broadleaf tree species are notably rare in this assemblage this represents scattered trees rather than part of an intact coastal forest.

The third most common species is kanuka, which forms almost pure stands when regenerating after vegetation clearance. At 21% of the total assemblage it suggests that regenerating scrub was relatively abundant locally. Smaller shrub species form only 10% of the samples. A final 10% of the assemblage consists of conifers – matai, kauri and kahikatea. Apart from kahikatea, stands of which occur on the inland margin of this sandspit today, these species would appear anomalous, if the assemblage were taken to relate to a living community. Conifers probably entered the assemblage as relict wood burnt as firewood, since trunks and stumps can survive on land surfaces or buried in dunes for hundreds of years after the death of the trees.

In brief, this charcoal assemblage suggests that the original matai dominated coastal broadleaf podocarp forest had been cleared by the time these sites were occupied. The living vegetation appears to have consisted of pohutukawa, probably concentrated on the shoreline, along with abundant puriri in the form of scattered trees rather than coastal forest. Patches of fairly pure kanuka scrub were also present among stumps of former forest trees.

One sample from each of the six middens was subsequently selected for radiocarbon dating, but these have yet to be processed.

Summary

From the number of archaeological sites dispersed around the Whangateau Harbour it is clear that Omaha was a significant area of Maori settlement. Six pa sites occupy the headlands surrounding the harbour including three on Ti Point overlooking and defending the entrance to the harbour (see Figure 1). The intensity of archaeological activity reflects the rich resources of the harbour, associated wetlands and creeks.

Preliminary earthworks for the Omaha Beach subdivision have exposed 157 previously unrecorded archaeological features. With the exception of isolated oven scoops these features have all been middens of varying size and complexity. The contents of the middens indicate that both the harbour/estuarine and beach environments were being exploited and that while some fish bone was present, shellfish appear to be the primary target. There is a clear bias towards exploitation of the harbour and some indication of netting, which would work well in the estuarine environment. There are some indications of fish preservation, but fishing, if an important activity at Omaha, is not represented in the archaeology. Additionally, the likelihood of shark and ray fishing occurring and playing a significant role in the local economy cannot be overlooked, particularly since evidence of such activity does not preserve well in the archaeological record. Many areas along the east coast were breeding grounds for shark and ray and traditionally these resources were highly regarded and often the focus of intertribal conflict.

Analysis of the middens provides several lines of evidence, which allows tentative interpretation of social group size and patterns of behaviour on the sandspit. For the most part the middens are all simple in structure and contain little evidence of stratigraphy. They can therefore be interpreted as short term events representing activities ranging from a few hours to weeks if not months, rather than permanent occupation or cycles of reoccupation of the same site. The size range suggests that some relate to the activities of one or two people while others are the result of large groups congregating perhaps for a hui or hakari over several weeks. Some of the larger middens have remnants of numerous hangi, which in themselves also have evidence of reuse. There is limited evidence for seasonal occupation provided by the location of some of these middens on beach ridges raised above areas prone to winter flooding and others in areas too damp for winter occupation. This evidence suggests occupation of the sandspit intermittently throughout the year, though it is likely that spring and summer would be the most favourable time for larger groups to gather.

Features associated with more permanent occupation, such as storage pits and complex series of postholes representing substantial structures, are not present. Nor does the ground surrounding or under the middens provide evidence of more ephemeral structures such as temporary shelters or drying racks for the preserving of seafood. However, the adjacent mainland surrounding the sandspit and harbour does provide plentiful evidence of more permanent settlements in the area.

Preliminary GIS analysis of midden distribution (taking into account variables such as size and composition) does reveal some interesting patterns, but some of these patterns may reflect historic activities such as quarrying for sand and shell known to have occurred for approximately 25 years at the beginning of the 20th century. Samples for dating have been submitted for analysis and these results should be able to provide further insights into the history and activities of pre-European use of the Omaha sandspit.

While economic explanations for the archaeology turn out to be unsatisfactory, social explanations hold greater promise. The large size and relatively short occupation of some of the middens could well reflect large hui or hakari on the dunes. Ngati Manuhiri have a tradition of such events, with a large hui resulting in representatives meeting in the neighbouring pa sites, though whether on Te Kie Point or the larger settlement on Ti Point is unknown.

Another possible explanation for some of the deposits be found in the traditional history, which records Nga Puhi withdrawing to the sandspit before recommencing the battle with Kawerau on the following day. This would involve hundreds of warriors needing food, and shellfish would be the most accessible sourçe of food in such circumstances.

Development at Omaha is about to enter Stage 2, and further monitoring and excavation will be carried out then. A full reporting of the archaeology and analysis of Omaha, including radiocarbon dates and finer grained midden analysis, will be presented in due course.

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References

Auckland Regional Council Parks, 1992. Tawharanui Regional Park: Management plan. Auckland Regional Council, Regional Parks Services.

Best, Elsdon. 1977 [1929]. *Fishing Devices and Methods of the Maori.* Dominion Museum Bulletin 12. V. R. Ward, Government Printer, Wellington.

Campbell, Matthew, Rod Clough, Mica Plowman, Don Prince, Kim Tatton, Marianne Turner and Tania Mace. 2001. Omaha Beach: archaeological investigations – preliminary report (July – December 2000). Report prepared for Omaha Beach Ltd.

Clough, Rod. 1997. Mangatawhiri Farm Development: Archaeological assessment. Report prepared for Boffa Miskell Ltd.

Harrison Grierson. 1999. Residential Subdivision, Omaha Beach Neighbourhood Units 4 & 5: Geotechnical investigation report. Report prepared for Manapouri Developments Ltd.

Leach, B. Foss. 1997. *Guide to the Identification of Fish Remains from New Zealand Archaeological Sites*. New Zealand Journal of Archaeology Special Publication, Wellington.

Parkinson, Brian. 1999. *Common Seashells of New Zealand.* Mobil New Zealand Nature Series. Reed Books, Auckland.

Paulin, Chris, Andrew Stewart, Clive Roberts and Peter McMillan. 1989. *New Zealand Fish: A Complete Guide*. National Museum of New Zealand Miscellaneous Series, 19. GP Books, Wellington.

Pritchard, Kim. 1983. *Prehistoric Maori Settlement Patterns in East Rodney*. Unpublished Thesis, University of Auckland.

Tonkin & Taylor. 1998. Omaha Development: Revised coastal hazard assessment. Report prepared for Boffa Miskell.

Tonkin & Taylor. 2000. Omaha South Development, Neighbourhood Units 4 and 5: Geotechnical investigation report. Report prepared for Omaha Beach Ltd.

Table 1. Shellfish MNIs for all analysed middens.

Site number	Number of samples	Pipi (*Paphies australis*)	Other mixed habitat species	Sandy shore species	Cockle (*Austrovenus stutchburyi*)	Other estuarine species	Rocky shore species	Unidentified
OMH005	3	749	4	20	23	4	4	
OMH009	1	338	2	4	12		1	
OMH010	1	314	1	10	2	1	1	
OMH011	15	1888	41	354	291	14	10	10
OMH013	9	684	48	104	1274	8		2
OMH014	1	6	1		3			
OMH017	1	145			9			
OMH020	2	24	4	54	1		1	
OMH024	2	342		4	25			
OMH025	1	315		4	3	2	1	
OMH026	1	281	3	9	26			

OMH029	2	253	1	2				
OMH035	6	820	15	40	233		5	6
OMH041	1	90						
OMH042	5	700	29	114	112	34	3	42
OMH047	2	455	5	21	15			2
OMH053	4	396	2	7	14	1	1	
OMH054	1	200	1	37			1	
OMH056	2	490	4	55	80	1	1	2
OMH065	2	325	2	4				1
OMH081	2	187	84		9		1	3
OMH083	1	245	4	12			4	2
OMH095	1	210	6	43	36	8	10	4
OMH106	2	383	2	5	9			
OMH114	2	179	14	16	46	118	80	11
OMH120	9	1345	25	190	28		2	5

Table 2. Fish bone counts for all analysed middens..

Site	Species	MNI	NISP [a]	Vertebrae
OMH005	*Thyrsites atun*	1	2	
OMH011	*Pagrus auratus*	1	2	
	Trachurus sp.	1	2	
	Fish sp.			53
OMH013	*Thyrsites atun*	1	2	
	Trachurus sp.	2	6	
	Fish sp.			11
OMH014	*Trachurus* sp.	1	1	
	Fish sp.			1
OMH017	Fish sp.			2
OMH032	*Trachurus* sp.	1	5	
	Fish sp.			12
OMH035	*Trachurus* sp.	1	2	
	Fish sp.			1
OMH042	*Arripis trutta*	1	2	
	Carangidae sp.?	1	1	
	Pagrus auratus	1	3	
	Thyrsites atun	1	2	
	Trachurus sp.	3	33	
	Fish sp.			174
OMH047	*Trachurus sp.*	1	1	
	Small fish sp.	17	83	
	Small fish sp.			33

Site	Species	MNI	NISP [a]	Vertebrae
OMH053	*Chelidonichthys kumu*	1	1	
	Fish sp.			3
OMH054	*Trachurus sp.*	1	2	
	Fish sp.			6
OMH056	*Thyrsites atun*	1	1	
	Fish sp.			2
OMH081	Fish sp.			2
OMH095	*Trachurus* sp.	1	1	
	Fish sp.			43
OMH106	Fish sp.			1
OMH114	*Pagrus auratus*	1	4	
	Trachurus sp.	4	11	
	Fish sp.			148
OMH120 [b]	*Pagrus auratus*	2	4	
	Thyrsites atun	1	2	
	Trachurus sp.	1	1	
	Fish sp.			12

Notes:

[a] NISP for Trachurus includes scutes (25 out of total NISP of 65)

[b] Not including isolated finds on the surface of the deflated midden