

ARCHAEOLOGICAL INVESTIGATION OF SITE T12/1084, WHANGAMATA, FINAL REPORT



REPORT TO
THE NEW ZEALAND HISTORIC PLACES TRUST,
AND
RICHARD AND JAN MYERS

JADEN HARRIS AND BEATRICE HUDSON

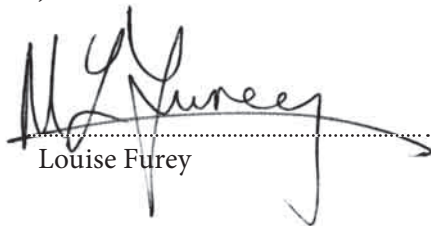
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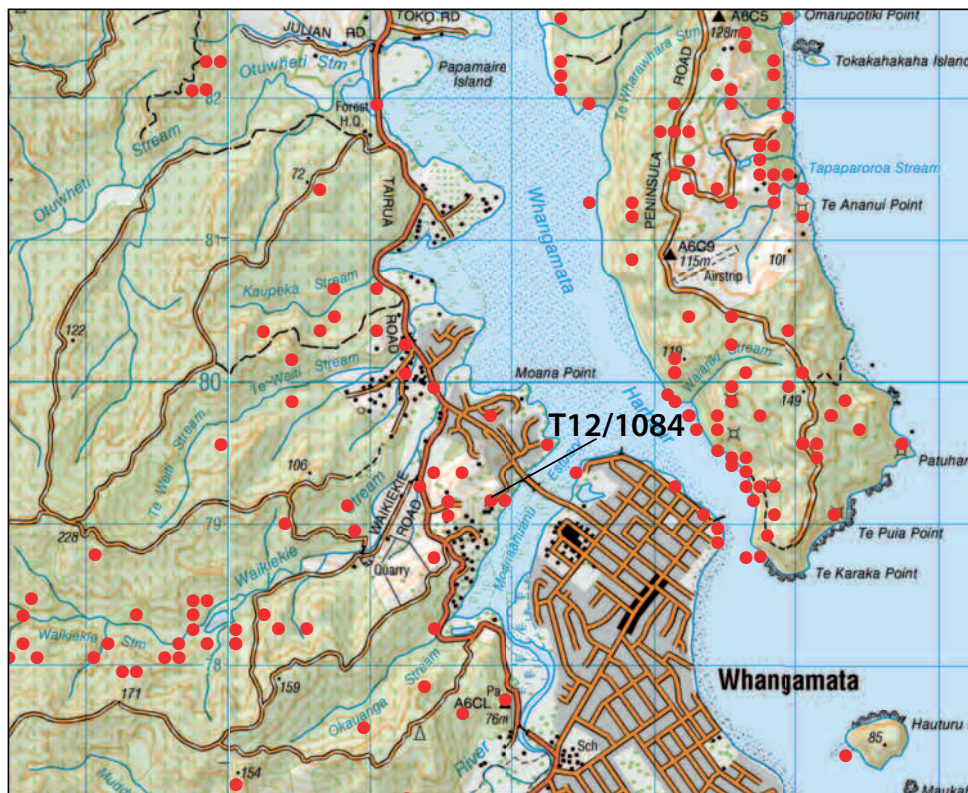
ARCHAEOLOGICAL INVESTIGATION OF SITE T12/1084, WHANGAMATA, FINAL REPORT

JADEN HARRIS AND BEATRICE HUDSON

Site T12/1084 is a midden and terrace site overlooking Whangamata Harbour and the Moanaanuanu Estuary (Figure 1). The site, accessed from Manuka Place (Lot 4, pt Lot 29 DPS 29407 and Lot 1 DPS 36558), was investigated from 1–6 March 2010 under authority 2009/40 issued by the New Zealand Historic Places Trust under Section 14 of the Historic Places Act 1993. Archaeological excavations took place on the proposed driveway access and on the flat plateau where a house is to be sited.

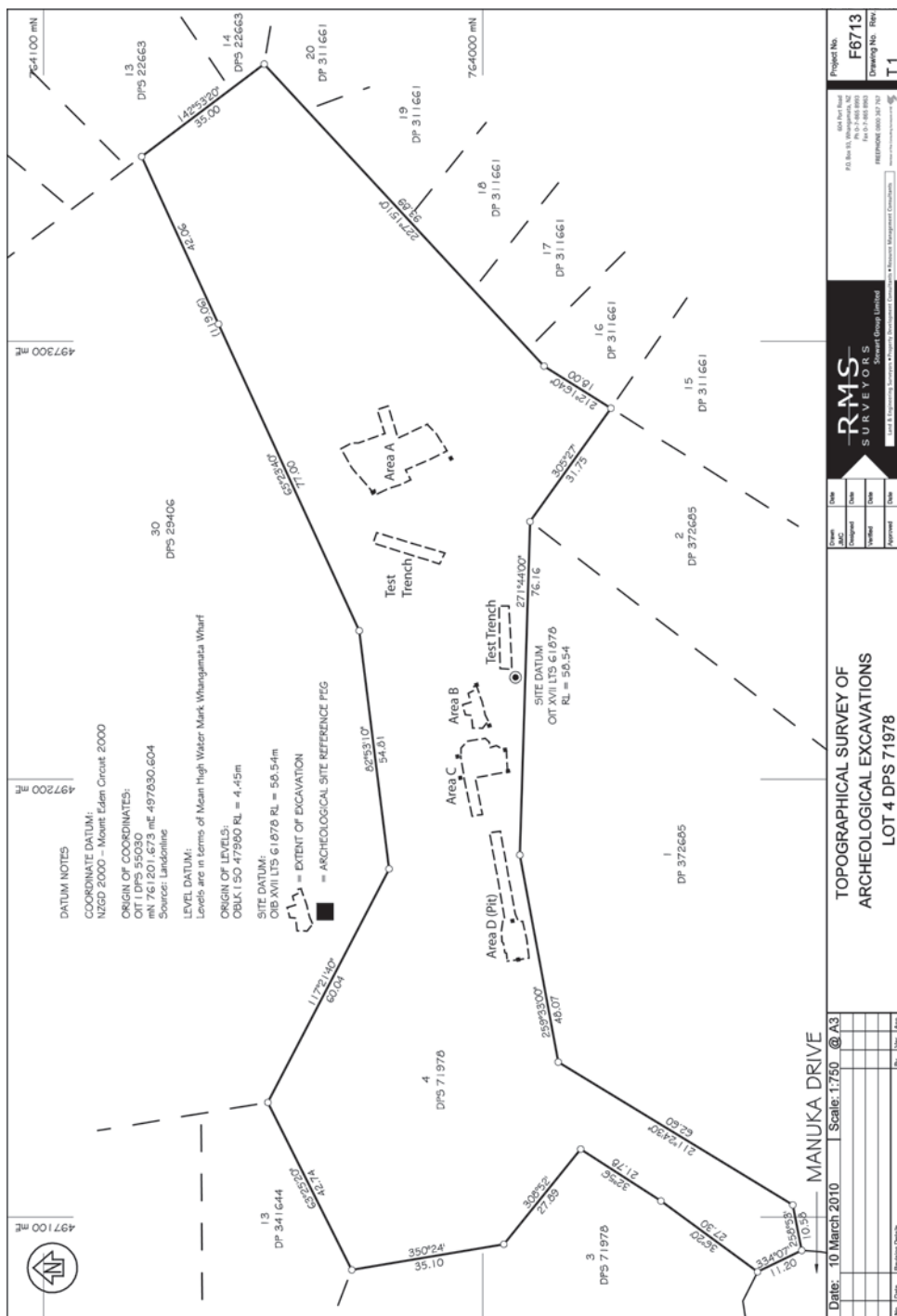
Landscape

The property consists of an east–west facing spur with a steep slope on the northern side, which broadens out to relatively wide and level plateau before dropping off sharply to the eastern boundary (Figure 2). Visible archaeological features identified prior to the investigation were confined largely to the crest of the spur and around the edges of the wide level area (Furey 2008). Two shallow terraces on the spur and one terrace lower down, also on the spur, suggested that there may be other terraces obscured by erosion. A large square depression on the crest of the spur was recorded as a kumara storage pit. On the level plateau shell midden was noted around the edges but there was no indication of features on the plateau itself.



1. Location map showing T12/1084 and other recorded archaeological sites in the vicinity.

2. Survey plan of the property showing areas excavated.



Archaeological Landscape

The area around Whangamata has a high density of archaeological sites (Figure 1) and T12/1084 should be viewed as part of this wider landscape. Most of the recorded sites are concentrated on the peninsula on the north side of Whangamata Harbour and on the hills and along the waterways on the inland side of Moananuanu Estuary and Whangamata Harbour. This uneven site distribution is due to archaeological survey being mainly carried out in the plantation forests and does not

indicate that sites are not present elsewhere. Anecdotally numerous shell middens were uncovered during the Moana Point subdivision earthworks (between the hill and the harbour) in the 1970s but few of these sites remain.

The area has occupation evidence from 7–800 years ago through to the historic period.

Previous archaeological work in Whangamata

Relatively few pit and terrace sites have been excavated in the Whangamata area, with investigations mainly having been in response to development around the coastal margins of the harbour. One of the more important sites that have been investigated is T12/2–3 located just inside the mouth of the harbour. While there are two separate numbers allocated, these two sites (Whangamata Wharf and Cabana Lodge) are probably part of the same occupation and date to 6–700 years ago. The Whangamata Wharf site excavated in 1970 has not been dated but the material culture confirms that it is an early site (Allo 1972). The Cabana Lodge site was excavated in 2007 by Warren Gumbley but the report is not yet available. A small midden site, T12/1035, adjacent to the Moanaanuanu Estuary was investigated as part of the Whangamata Marina development (Hoffmann 2009). This diffuse shell deposit without any associated features was probably a shellfish processing site occupied during the summer. The ridge to the west of T12/1084, known as Elsinore Heights, T12/1044, was investigated prior to housing subdivision: storage pits, postholes, shell midden and possible garden soils were uncovered (Gumbley 2005). Excavation of two sites (T12/617 and T12/654) in forestry areas to the north of the harbour revealed shell midden, cooking areas and postholes (Furey 1987; Short 1988).

Soils

The soils in the vicinity of Whangamata are derived largely from volcanic tephra erupted from Mayor Island and the Central Volcanic Region over the past 40,000 years. In Whangamata the most conspicuous tephra is a coarse pumaceous lapilli, classified as Tuhua Tephra, which can be up to 600 mm thick and derives from volcanic activity on Mayor Island approximately 6200 years ago (Hogg and McCraw 1983: 163). In Whangamata the lapilli is composed of dark reddish-brown particles up to 30 mm in diameter and has a weakly bonded structure. More recent tephra such as Kaharoa are not present as a distinct layer but have been mixed into the upper horizon through root and worm action. Other older tephras consist mainly of fine yellow–brown ash, which have developed into silty loam soil.

On this site distinct layers of lapilli could be observed, while in other areas the lapilli had been mixed with finer ash and soil through either cultural or natural processes. On the steeper parts of the hill and along the crest of the spur lapilli was sometimes absent and the subsoil consisted of older, more consolidated volcanic loams.

Archaeological investigation

The main objective of the investigation was to identify and record any archaeological features likely to be affected by the formation of an access driveway and house site. Prior to the investigation the house site had been marked out with pegs in each corner and the route for the driveway was marked on a scale topographic site plan. Other archaeological features on the property outside of the area to be affected by the development were not investigated.

Methodology

Initially trenches were opened up in the areas where archaeological evidence was visible on the surface. This included the large pit on the top of the spur and the two possible terraces running down the crest of the spur. No features were visible on the surface in the vicinity of the house site, but shell midden on the upper part of the slope to the west of the house area suggested further investigation was warranted. A four tonne hydraulic excavator was used to remove topsoil and expose shell midden and other features.

Exposed surfaces were cleaned down by spade and trowel to define any features. Shell middens were sampled and planned before being removed either by spade or excavator to expose any features below. No material was sieved on site and any flakes of obsidian were bagged by area and context as they were exposed. Bulk samples of midden and shell fill from selected oven scoops were retained for analysis. Smaller samples of shell and fill were taken from other contexts for radiocarbon dating. Details of all features were recorded on feature sheets and a scale plan of the features in each area drawn. A basic description of all features found during the excavation is given in Appendix A.

Results

Area A

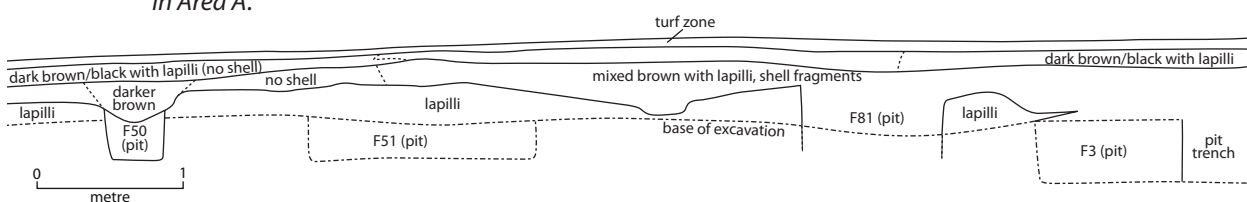
Approximately two-thirds of the designated house platform area was investigated. An initial trench dug through the centre of the area revealed that the greatest concentration of archaeological features was likely to be at the western (uphill) side of the area and a larger area was then opened up to the extent of the defined house footprint. Two distinct cultural layers were identified.

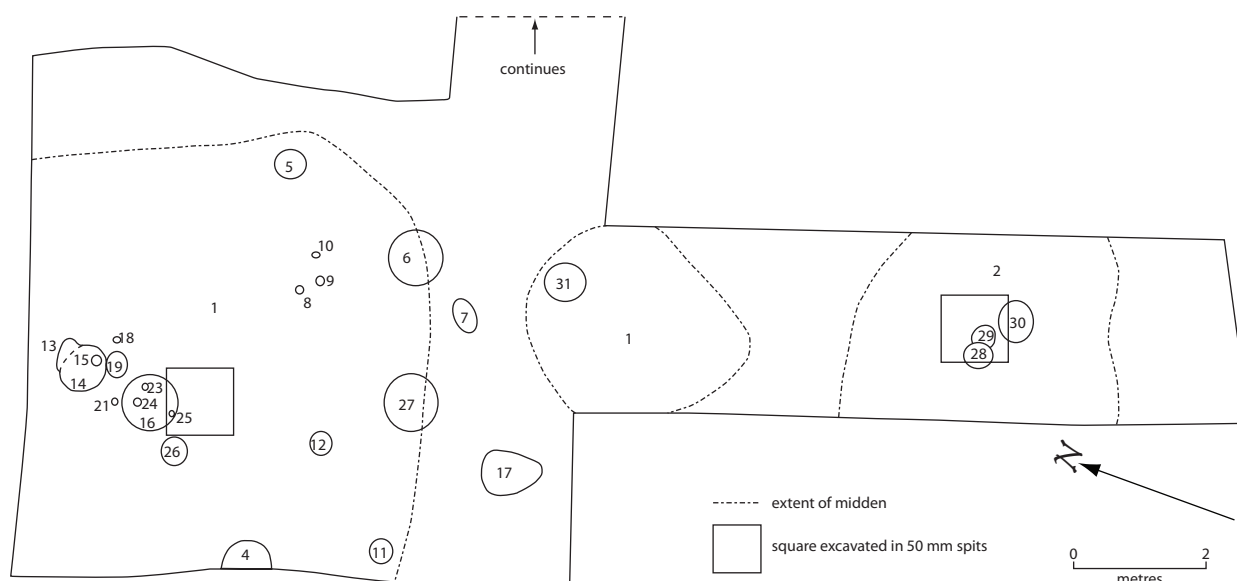
The relationship between the two cultural layers is clearly illustrated in the section drawing of the north-west baulk (Figure 3). Directly underneath the turf zone was the upper cultural layer consisting of shell midden and scoop features. This layer was a dark brown/black soil with lapilli and crushed shell, although the shell was not continuous across the section. Beneath this was the brown mixed fill layer which was much cleaner and contained only occasional shell. The storage pits were dug into the lower cultural layer.

Upper cultural layer. Immediately below the turf layer were two discrete patches of shell midden (Features 1 and 2) shown in Figure 4. No features were apparent on the surface of the midden. The midden deposit was sampled by excavating a one metre square in spits and retaining 10 litre bulk samples taken at 50 mm intervals. Feature 1 midden was 100 mm deep, while Feature 2 was shallower. Two oven scoops were present in the base of the layer of the sample square in Feature 2, and as the Feature 1 midden was progressively cut down by spade similar oven features were cut into the midden and into the mixed fill below it (Figures 5 and 6). As the midden was not continuous, the relationship between Features 1 and 2 and other smaller patches of midden is less clear.

Beneath the midden was a layer consisting of brown/grey mixed tephra containing sparse shell, charcoal and occasional oven stones overlying the storage pits described below.

3. Section drawing of the north-west baulk in Area A.





4. Plan of Area A showing extent of the midden and features excavated in the upper cultural layer.

Lower cultural layer. Once all of the Layer 1 features had been excavated and planned the hydraulic excavator was brought back in to clear the area down to the level of the pits. Once this was achieved rectangular pits were clearly defined along with patches of brown fill suggestive of further pits. To maximise information recovery in the time available only part of the larger pits were excavated to define their form, provide a depth, and investigate any possible internal features.

The most notable component of the lower cultural layer was the storage pits, with five on the same west-east alignment. The largest of these was Feature 3 and measured >4800 x 1550 mm x 500 mm deep. The pit continued into the northwest baulk of the excavation area, but the base of what appeared to be a buttress was exposed in the trench through the pit at this point suggesting that the end of the pit was not much further beyond. The pit was cut into the loose, unstable lapilli so the edges at this upper level were irregular and not well defined. Once the pit wall was traced down into the much firmer yellow-brown tephra the edges became straight and regular. The larger rectangular pits are all on the same alignment and would appear to belong to the same phase of occupation but the loose, unstable nature of the lapilli and the narrow spacing between some of the pits suggest that they are more likely to have been dug successively rather than having been in use at the same time (Figure 7).

Despite only portions of the pits being excavated several internal features were recorded. Pit 81 was a relatively shallow rectangular storage pit which ran into the baulk (Figure 8). Along the northern side were two small stakeholes dug into the floor, and dug into its base at the eastern end was a small bell-shaped bin, with an opening measuring 450 x 400 mm with the back and sides dropping down vertically to a depth of 550 mm below the pit floor. At the front the side sloped inwards to create a slightly overhanging roof, with the floor space at the base of the pit measuring approximately 450 x 650 mm. For what purpose such confined

5. Feature 2 midden, Area A, showing excavated square with oven scoop features in the base (scales 1 m).



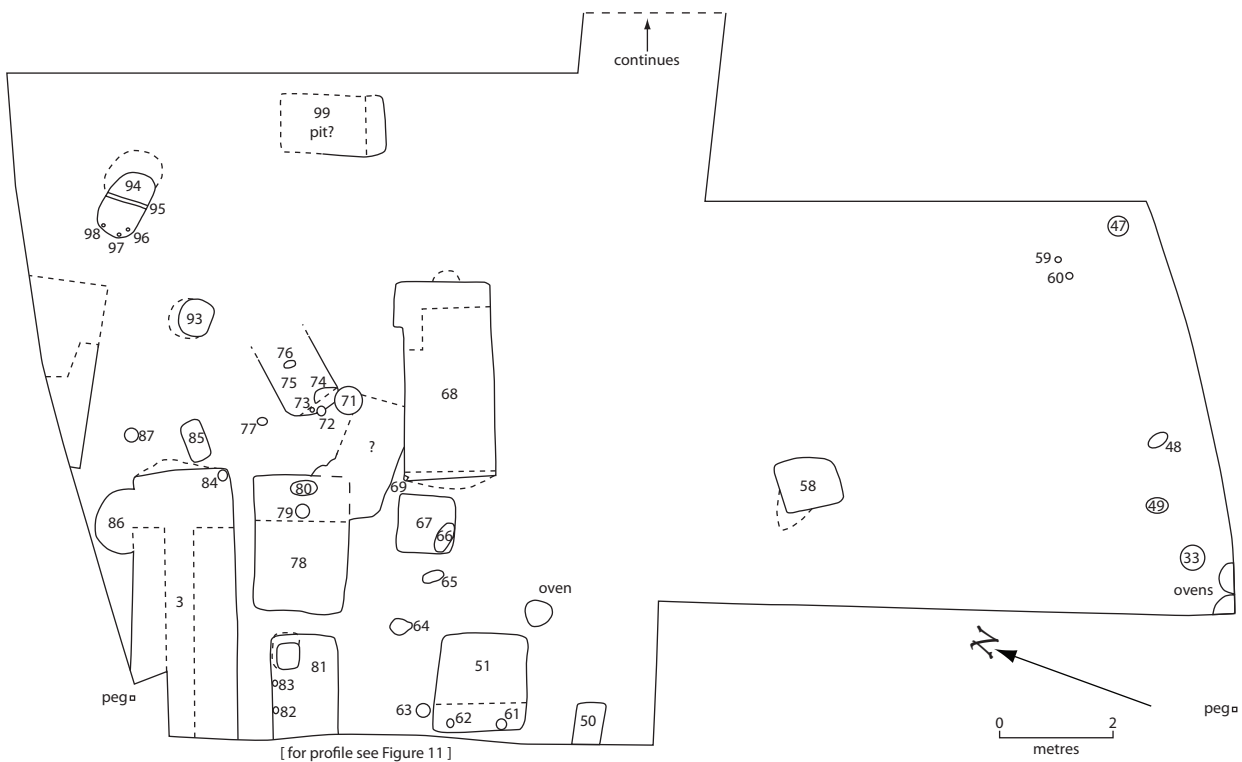


6. Feature 16, Area A, an oven scoop cut into fill at the base of the Feature 1 midden (scale 1 m).

storage spaces were used is not known, but it is not uncommon for pits to have smaller spaces dug into the floor and lower walls. Pit 51 had two postholes dug into the floor at the excavated northern end. Pit 68 was defined by a roughly rectangular patch of brown fill on the surface and once the end was excavated the sides became straight and regular, dug into the harder yellow-brown loam below the lapilli. In the northwest corner of the pit was a triangular board slot hard in the corner running from the top of the pit down into a small posthole 90 mm diameter by 200 mm deep in the base of the pit.

Apart from the large rectangular pits, other pits of varying size and form were excavated (Figure 9). One of the more interesting was Feature 94, a small bin pit (Figure 10) The entrance had three small stakeholes around the top and the floor of the entrance sloped down towards the storage chamber. Near the bottom of the sloping section of floor was a slot approximately 70 mm wide and 80 mm deep, presumably for a door or covering to the chamber. The floor of the chamber measured 900 x 900 mm and was undercut towards the back and on its northern side to form a subterranean storage space. The roof of the chamber has since partly collapsed or been truncated and probably would have extended back further towards the board slot. Such a small space would have been impractical for kumara storage and the design hints at a more specialised use which is not indicated in the archaeological record. A round pit (Feature 86) cut by Feature 3 may also originally have been a

7. Plan of Area A showing storage pits and other features excavated in Layer 2.



small bell-shaped structure as the floor continued under that of Feature 3 and the sides were also curved suggesting that it may have had a domed roof.

Small bin pits such as Feature 50 were clearly defined. Other smaller rectangular pits were present and identified by the fill, but their form was indistinct in the loose lapilli and they did not cut deep enough into the harder yellow/brown loam. Despite the lack of definite form in some of these pits, postholes in their bases confirm that they are actual features.

In the southern and eastern half of the excavation area few features were found below the level of the midden. In the southern baulk however it could clearly be seen that some of the lenses of shell midden and associated oven scoops derived from different layers. In the southwest corner of the excavation area two oven scoops 600 mm below the turf are clearly separate from the features associated with the Feature 2 midden. Other scoops were identified cut into the soft lapilli and were mainly distinguished by the dark fill containing shell, rather than from any regular form. Few features could be identified in the area between the scoops and the storage pits; upon investigation most of the brown splodges in this area turned out to be shallow and irregular non-archaeological features following the natural surface of the lapilli. One of the few definite features was a small rectangular pit (Feature 58) measuring 1100 x 1000 mm x 360 mm deep. In one corner the pit had a low undercut space extending back 300 mm.



8 (left). Feature 81, Area A, showing the cut for the pit exposed in section.



9 (bottom left). The area of the pits in the north-west corner of Area A after excavation.

10 (below). Feature 94, Area A, after excavation.



Area B

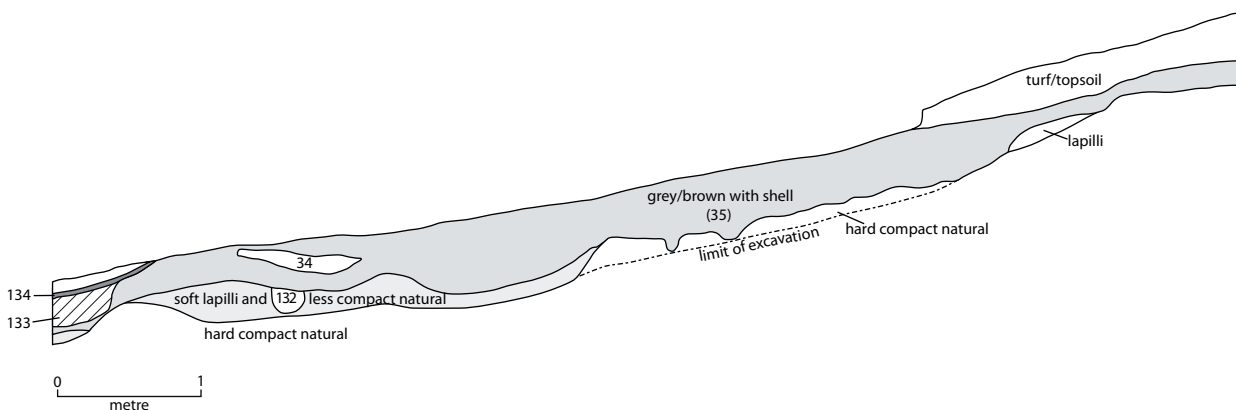
This area was the lower of two possible occupation terraces in the path of the driveway. During the assessment the two terraces had the appearance of wide undulations rather than definite level terraces. However, given that they were on a steep slope, their lack of clear form was put down to soil creep; back and front scarps suggested they were cultural features. Turf was removed from the most clearly defined part of the possible feature to expose any possible surface and front or back scarps of a constructed terrace. A 500 mm wide trench was then dug through the centre of the area to expose the stratigraphy in section.

Excavation revealed no evidence of a constructed terrace, that is, a definite vertical or near vertical cut at the rear into the slope, but shell midden deposited over the surface, and features cut into the midden and below it, suggested that the natural slope was utilised for some form of occupation. At the back of the slope the natural subsoil was a fine, compact pale yellow tephra-based soil that was found at a depth of 500 mm below the turf. Towards the middle or flatter part of the area, this subsoil was overlain with up to 200 mm of in situ coarse lapilli while the more compact fine subsoil beneath it became increasingly undulating (Figure 11). These natural subsoil layers were overlain by a thick cultural layer of mixed grey-brown soil containing fragmented shell (Feature 35), directly under the topsoil. The grey-brown layer varied in thickness from 200 mm to 780 mm in the northwest corner. This is a substantial amount of build up of culturally derived material and must have been generated by activity on the terrace immediately above (Area C). The mixing of shell into this layer was curious however, since no shell was found anywhere in Area C.

Two postholes (Features 45 and 46) found in the trench were dug into the compact tephra-based subsoil. The trench was widened and the northern half of the area excavated to identify the extent of the occupation area. An alignment of postholes (Features 39–44; Figures 12 and 13) was found to descend down the slope at the back of the area. This may represent a windbreak constructed on the slope, but the alignment did not continue so it is difficult to comprehend how it would have been an efficient windbreak. Another two postholes (Features 38 and 132) and two scooped features (36 and 37) were found across the exposed lapilli surface. Towards the front of the area a small scooped feature (133) and two burnt shell lenses (Features 34 and 134) found respectively within and on top of the grey-brown layer of cultural fill (Feature 35) are evidence of a small amount of later activity.

No cut back scarp was found and the possible terrace surface proved not to be flat, so it appeared to be a natural sloping terrace with an undulating compact sub-

11. Section drawing showing the stratigraphy of Area B (note the absence of any indication of a cut terrace surface, or backscarp, in the profile).



soil base overlain in part by a natural layer of very loose, coarse lapilli. There was some limited human activity here at two different times – it seems that the area was used both before and after activity took place in Area C to generate the cultural layer that covered the terrace. The area was a notable contrast to Areas A and C in that not a single piece of obsidian, or other artefact, was found here.

Area C

A trench was opened in Area C through what had also been identified as a likely occupation terrace above Area B. A trench was dug so as to intercept the backscarp of the terrace, the occupation surface of the terrace itself, and any midden or other material which may have been deposited down the frontscarp of the terrace (Figure 14).

A low irregular backscarp was identified but the surface of the terrace itself was found to be gently sloping, and appeared to be a modified natural feature rather than a cut terrace (Figure 15). In contrast to Area B there was very little fill over the terrace surface, and no shell midden. Two rectangular pits and an irregularly-shaped pit were present, deliberately infilled with yellow-brown tephra of a slightly darker colour to the natural subsoil into which they were cut. One other small pit, or cavity, was dug into the backscarp and the hillslope. Only one posthole was identified and there was no other evidence of there having been any structures, such as a house or shelter, on the terrace.

At the front of the area a trench was dug by hand down the slope to define the forward edge of the terrace area. The trench also helped to define the edges of the two rectangular pits. At the front of the terrace an area of fill had possibly been dumped deliberately to extend the area of the terrace. Again the fill contained no shell but a fishing weight and flakes of obsidian and other stone were found. The fill was overlying lapilli, with harder yellow-brown loam beneath.

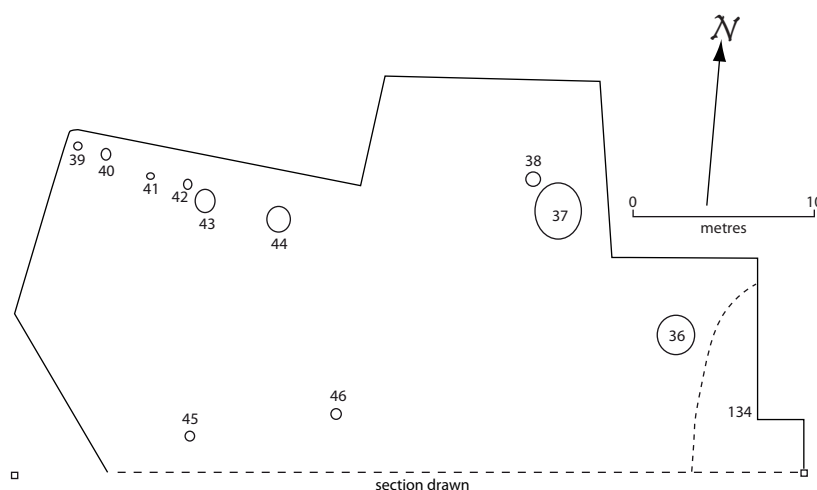
Area D

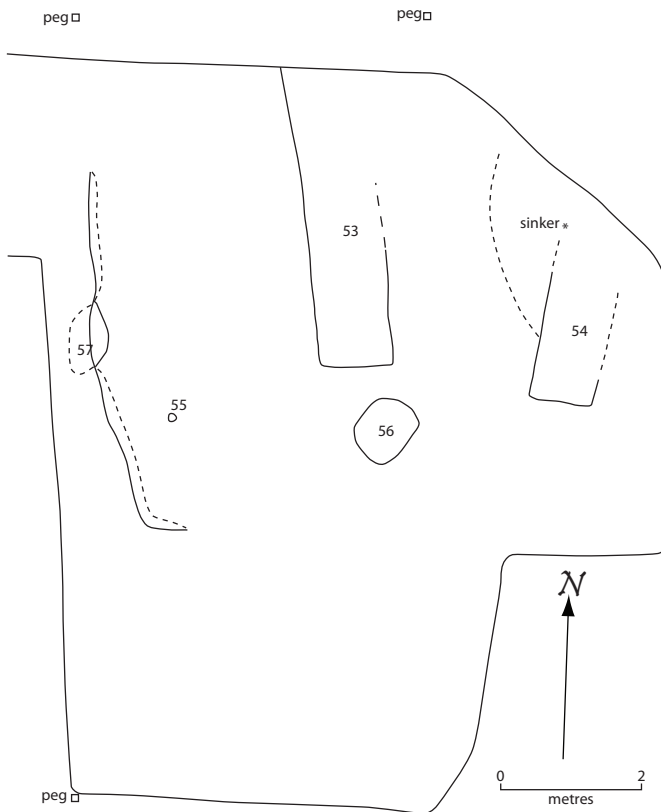
During the initial assessment of the property a large, shallow depression had been noted on the crest of the spur by the southern boundary of the property. When the turf and thin topsoil (50–100 mm) was stripped off this area, the edges of the feature remained unclear but a large pit became apparent after another 100 mm had been removed. The fill of the pit was removed with the digger, leaving a buffer of fill covering the edges and base. The western half of the pit was then excavated in full by hand to



12. The alignment of postholes (Features 39–44) dug into the slope at the back of Area B. Facing west, scale is 1 m.

13. Plan of Area B showing features excavated, extent of area investigated and location of section drawn.





14 (top). Plan of Area C showing features excavated and extent of area investigated.

15 (bottom). Photo looking north of Area C showing sloping surface of terrace and low backscarp, and testpits dug in pit features (scale 1 m).

observe the pattern of any postholes in the pit floor (Figures 16 and 17)

The pit, Feature 100, was rectangular with straight sides that showed little evidence of collapse. It was cut through the pale yellow subsoil and into the natural substratum of andesite rock, only 200 mm from the surface. The rock is hard but weathered, so excavating a pit would be difficult but akin to digging in very hard, compacted clay. The pit fill was a homogenous, loose, medium brown soil. This became more compact at the base of the pit, particularly in the western end around what was interpreted as a step, or raised plinth, against the pit wall. There were occasional small lumps of andesite within the fill, which was otherwise very clean and contained no shell, artefacts or other cultural material. The coarse lapilli was not present on the ridgetop — this was to be expected as the lapilli is very loose and mobile and unlikely to build up or remain at the crest of the ridge.

The pit measured 7500 x 4000 mm and was at least 800 mm deep. In the excavated half there were 27 postholes dug into the base of the pit (Features 102–128; Figure 18). Since they were dug into the hard andesite they had very hard edges that were very clearly defined. Twelve of the postholes conformed to a layout of four rows of postholes, of similar size and depth (generally 100–160 mm diameter and up to 320 mm deep), running lengthwise in the pit. These would have supported the roof structure. There was also one posthole on each side of the step in the western end of the pit, postholes that extended horizontally into the western and southern walls of the pit at floor level (Features 130 and 131), and 11 postholes and stakeholes that did not fit the grid layout. A square cut modern fencepost

was also encountered. Some postholes had compacted soil inside them towards the base that was a similar to the rest of the pit fill, but that had probably been deposited there before the wooden posts were put in and so become compacted beneath them.

In the centre of the western wall was a rounded feature with curved sides and a flat base that was cut into the upper half of the wall (Figure 19). Its base was continuous with a raised lump of the grey andesite material that had been left proud when the pit was dug. Together these created a step into the pit. The fill of the rounded feature was the same soft soil that filled the rest of the pit.

In the northwestern corner was a round bin pit (Feature 129) that predated and had been cut by the rectangular pit. It had curved sides and a slightly curved base on the same level as the pit base and was filled with a loose brown soil was very similar to that of the pit.

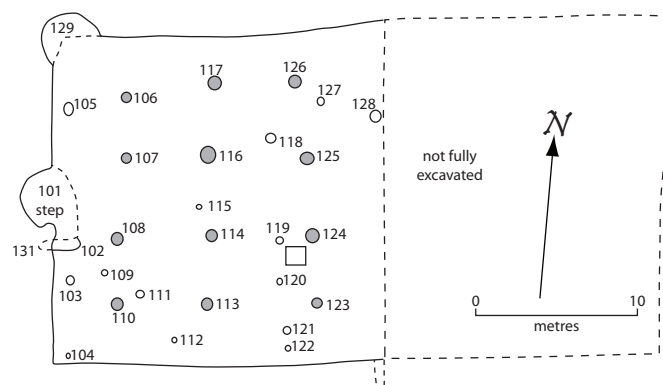
Other Trenches

Two other trenches were put in between the main areas investigated along the line of the driveway. In Trench 1 (Figure 20) the topsoil was relatively shallow and sat directly on sterile subsoil. There was no terracing or other evidence of occupation on this part of the spur. Trench 2 was placed across the slope and cut through what appeared to be two natural slump features rather than formed terraces. The soil profile was much deeper (up to 600 mm) and consisted of dark topsoil with a deep mixed layer of volcanic soil below containing charcoal and shell. This soil profile was similar to that overlying the pits in Area A. None of the shell was in situ and most of this mixed material appears to have migrated down the steep slope from occupation further up the hill. The trench was cut down to sterile subsoil and there were no features visible in the base.

Midden Analysis

Methodology

Bulk ten litre midden samples were processed and analysed using a methodology developed by CFG Heritage. The samples were air dried, weighed, wet sieved through a 6 mm screen and redried. Samples were then sorted following standard archaeo-



16. West-facing view of Feature 100. A modern square posthole can be seen in the base of the pit. Scales are 1 m (horizontal) and .5 m (vertical).
17. East-facing view of Feature 100. Scales are 1 m (horizontal) and .5 m (vertical).
18. Plan of Feature 100 and excavated internal features, alignments of postholes are shaded grey.
19. North-facing view of the excavated half of the pit showing the step on the left. Scales are 1 m (horizontal) and .5 m (vertical).



20. Trench 1 running down a steep section of the spur, with the Moanaanuanu Estuary and Whangamata Marina in the background.

logical procedure. The diagnostic portions of each shell type present were separated out and counted to give a MNI (minimum number of specimens) for each species. For bivalves this was achieved by counting the number of hinges and whole valves and dividing the total by two. For gastropods the greater number of shells and columellas, or operculae was taken as the MNI. All diagnostic shell for each species was weighed. Charcoal, stone and any faunal bone was separated out and weighed but not counted. Finally the residue (which consisted mainly of non-diagnostic shell fragments) from each sample was weighed.

Three basic statistics can be calculated from the resulting measures: dry weight/volume (g/l), dry sieved weight/volume (g/l) and weight loss through sieving (as a percentage). These statistics are intended to quantify the density of the midden, that is, how much material there is in the sample and how much of it is shell.

Context	Dry wt (g)	Sieved wt (g)	Dry wt/vol (g/l)	Sieved wt/vol (g/l)	% loss	Stone (g)
1 spit 1	7590	2315	759	231.5	69.5	4
1 spit 2	5800	842	580	84.2	85.5	65
2	9540	5302	954	530.2	44.5	161
4	7660	2657	766	265.7	65.5	112
16	9830	3905	983	390.5	60	28
71	6750	2729	675	272.9	59.5	931

Table 1. Weight data for midden samples (all samples 10 litres).

Context	Pipi (<i>Paphies Australis</i>)	Cockle (<i>Austrovenus stutchburyi</i>)	Tuatua (<i>Paphies subtriangulata</i>)	Cats Eye (<i>Turbo smaragdus</i>)	Whelk (<i>Cominella</i> sp.)	Paua (<i>Haliotis iris</i>)	Miscellaneous gastropod	Total
1 spit 1	39	356	3	21	5		21	445
1 spit 2	16	110		8	5		8	147
2	73	805	2	15	4		12	911
4	12	464		6		1	11	494
16	39	502	1	13	3		56	614
71	21	400		4		3	5	433

Table 2. Species data for midden samples, MNI.

Results

For the samples from the midden features in Area A it can be seen that Feature 2, while not as thick as Feature 1, actually contained more shell. This is reflected in both the percentage loss in weight after sieving and the total MNI of shellfish. Cockle (*Austrovenus stutchburyi*) and pipi (*Paphies australis*) are the most common species and would have been readily collected from the sheltered environments of the Moanaanuanu Estuary or Whangamata Harbour. The species composition is roughly the same for the two oven scoop from the base of the midden.

The only midden sample analysed from Layer 2 in Area A was from an oven scoop, Feature 71. Again cockle is the dominant species and the only noticeable difference is the inclusion of three paua shells.

Faunal Analysis

Small pieces of fishbone were separated out from the bulk midden samples during analysis. Seven pieces came from the sample from Feature 16, two from Feature 71 and one piece from Feature 1 and Feature 4. The fishbone was examined by Matthew Campbell and the only bones that could be identified were mackerel (*Trachurus* sp.) scutes.

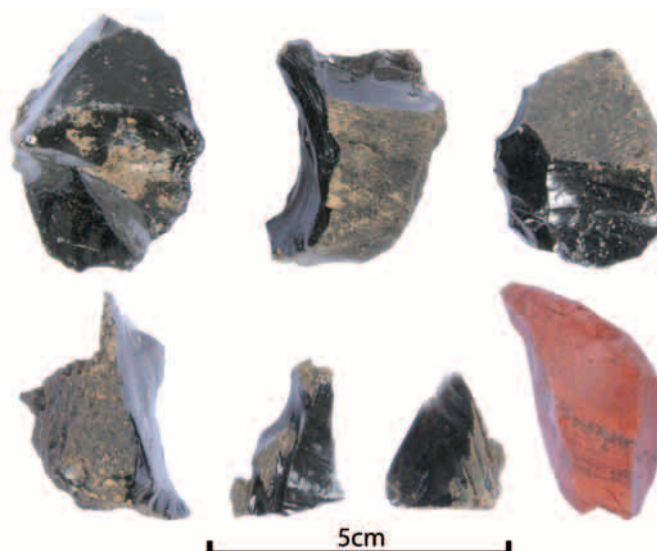
Material Culture

The only formal artefact recovered was a fishing weight from Area C. From Area A 26 pieces of obsidian and one piece of chert were collected, and from Area C one piece of sedimentary stone and one piece of obsidian. No artefactual material was collected or observed from Areas B and D, or the excavated trenches.

Obsidian

Of the obsidian collected from Area A twenty of the flakes were in the upper layer of midden overlying the storage pits (Layer 1, Figure 21). Just six flakes were found at the same level that the pits were cut into (Layer 2, Figure 22). All 26 flakes are grey in transmitted light and with only a few exceptions all have part of the original cortical surface. The flakes are small in size, with just two having a maximum length of more than 40 mm and the largest flake measuring 60 mm. The presence of a weathered cortical surface, and small size, indicates the flakes were struck from small cobbles and the material is more like shatter than formal flakes struck off a prepared

21 (top). Obsidian flakes from Area A, Layer 1.
22 (bottom). Obsidian and chert flakes from Area A, Layer 2.



platform. The most likely source for this obsidian is local, and small nodules or cobbles occur near the mouths of streams on the eastern side of the Whangamata Harbour (Moore 1999: 289). While all of the obsidian flakes were likely struck from similar sized cobbles, it is possible that two sources are represented as some flakes have noticeable spherulite inclusions, while others have no spherulites and exhibit weak flow banding.

Obsidian abrader

- 23 (top). Perlitic
obsidian abrader from
Area C.
24 (centre). Stone
abrader from Area C.
25 (bottom). Stone
fishing weight from
Area C.

A more unusual artefact from Area C is a large cobble of poor quality perlitic obsidian from Mayor Island. The chunk has maximum dimensions of 80 x 60 x 56 mm and is so flawed that it would be impossible to extract any useable flakes from it (Figure 23). The material however is well suited for use as an abrader and close examination of the surfaces revealed bruising and a flattened surface consistent with it having been used for such a purpose. Two fragments of a large cobble with similar characteristics have been previously recovered from the U14/2402 site in Tauriko, Tauranga. The source of that material was identified by Marianne Turner as Mayor Island, but in this case no other usewear was noted (Harris 2009: 6).



Chert

Just one piece of chert was found in Area A near the eastern edge of the excavation area. The flake, which has no usewear on the edges, is 42 mm long and is red in colour and has a small area of cortical surface that suggests it has been struck from a small cobble.

Other Stone

One piece of what appears to be sedimentary stone was recovered from a trench near the front scarp of the terrace in Area C. The piece has a maximum length of 92 mm. A closer examination of the broad surface on one side, and the edges, revealed usewear suggestive of it having been used as an abrader or rubber. Some wear on the surface of the stone can be seen in Figure 24. The material is a grey fine-grained sedimentary stone, but the source of the stone is not known.

Fishing weight

A large stone fishing weight or sinker was recovered from fill against the back scarp of the terrace in Area C (Figure 25). The artefact has maximum dimensions of 110 x

64 x 49 mm and weighs 428 g. The artefact has been reduced around the top for the attachment of a line. The artefact was most likely used as a fishing net weight. Again it is made from local poor quality, and relatively soft, stone.

Chronology

Cockle shell from the upper and lower occupation layers in Area A was submitted to the University of Waikato Radiocarbon Dating Laboratory. Wk-27921 was from Feature 16, an oven scoop in Layer 1, and Wk-27922 from Feature 71, also an oven scoop, in Layer 2.

Lab No	CRA BP	$\delta^{13}C$	cal AD, 68%	cal AD, 95%
Wk-27921	654 ± 35	1.3 ± 0.2	1560–1690	1500–1810
Wk-27922	658 ± 35	1.4 ± 0.2	1560–1700	1500–1770 (93.7%) 1780–1810 (1.7%)

Table 3. Radiocarbon age estimates.

The estimate of age of occupation on the site is broader than desirable. This is a factor of the calibration curve and not the material dated. The range indicates occupation took place sometime within the defined period, i.e., it did not take place prior to AD 1500 or after AD 1810, but the occupation was not of several hundred years duration.

The results were indistinguishable suggesting that the layers were all part of the same occupation or within a few years of each other. No suitable material for dating could be found from Areas B, C and D. Because these areas were not linked stratigraphically with Area A, it cannot be said with any certainty that the entire site was occupied at the same time.

Discussion

Kumara storage pits were initially placed at the rear of the plateau area, deliberately infilled with clean fill, and then the surface used for unspecified occupation which involved small areas of cooking and the discard of shell midden. Any structures or houses are likely to be within the area not excavated, and it is possible that further infilled storage pits will also be present towards the front of the plateau.

The occupation evidence was more ephemeral than expected. The location of the site, overlooking the flat land at Moana Point, the Moanaanuanu Estuary and all of the dune system of Whangamata, should have made it highly desirable from a residential point of view. The quantity of features on the adjacent ridge (Gumbley 2005) certainly reinforced that expectation. The storage pits would have been dug in autumn to store the kumara tubers over the winter months. Occupation may not necessarily have been continuous during that time, but the site is unlikely to have been lived on for years at a time.

The occupation evidence on Areas B and C was difficult to interpret. Natural erosion terraces were used with little modification, although fill had been added to the front of Area C to expand the useable area. The surfaces were not level, but this was not a deterrent to use. Two small rectangular pits and one oval bin pit were dug into the surface of Area C and then infilled when no longer required. Small pieces of andesite appeared near the irregularly defined backscarp of Area C suggesting

that the natural rock was not far under the surface. The terraces are likely to have been formed by slope instability and downhill movement of the tephra deposits overlying the andesite.

The large pit on the crest of the spur was on a knoll which dropped away steeply to north and south. The andesitic rock was very close to the surface here and the looser lapilli layer had been washed away, or removed. The pit was dug into the rock and would have been poorly drained unless it had a sump (not present in the excavated half). The arrangement of postholes in the excavated half suggested the roof was held up by four rows of postholes but there was no central ridgepole. The entrance was at the western end between the roof support posts. Smaller postholes or stakeholes suggest internal divisions or bins to keep different kumara varieties, or tubers for different uses, separate. The slots which extended into the southern and western walls were possibly for boards which also formed internal divisions of the space. The remnant round bin pit in the northwest corner hints at an earlier occupation on the knoll which was largely removed by the construction of, by any standards, quite a large storage pit. Very few pits have been excavated on the Coromandel Peninsula so it is difficult to say whether all the pits uncovered here are typical.

Site T12/1044, on the ridge to the west in Elsinore Heights, also had small bin pits and rua. Although there were rectangular storage pits and postholes uncovered, occupation evidence was not concentrated on either the ridgetop, or on the terraces. There were two distinct occupations at this site: the first involved terrace occupation and storage, while the second was associated with gardening and lineal structures such as fences. No evidence of gardening was found on this site, T12/1084, but in other respects the sites have similar occupation evidence.

Evidence from similar sites dates to post AD 1500 in the Whangamata area suggests this site may be typical of the occupation evidence. Gardening was obviously carried out and the tephra soils would have been ideal for kumara horticulture; they are well drained and friable and would have warmed up rapidly in the spring. Modern experimental growing of Maori kumara varieties indicates they are not affected by dry soil and drought conditions (Burtenshaw et al. 2003), so while the soils might not be ideal for modern pasture grass they were well suited to successful kumara growing. Each site investigated has had kumara pits indicating gardening and crop storage was important, as was collecting and eating shellfish. Evidence of fishing was slight but in no other later sites in the area have fish remains been found.

Acknowledgements

The excavation team consisted for the duration of the dig of Beatrice Hudson, Jaden Harris and Ben Thorne, with help for part of the time from Ella Usher and Louise Furey. Tangata whenua involvements were facilitated by Louise Furey through Ngati Pu representative Ted Shaw. Thanks also to landowner Richard Myers for his participation and interest in the project.

References

- Allo, J. 1972. The Whanga wharf site (N49/2): excavations on a Coromandel coastal midden. *Records of the Auckland Institute and Museum* 9: 61-79.
- Burtenshaw, M., G. Harris, J. Davidson and F. Leach 2003 Experimental growing of pre-European cultivars of Kumara (Sweet Potato, *Ipomoea batatas* [L.] Lam.) at the southern margins of Maori horticulture. *New Zealand Journal of Archaeology* 23 (2001): 161-188.
- Furey, L. 1987. Excavation of an open settlement site near Whangamata. *NZ Archaeological Assn Newsletter* 30: 215-226.
- Furey, L. 2008 Archaeological assessment of Myers property, Whangamata. Unpublished report to Richard and Jan Myers.
- Gumbley, W. 2005. T12/1044: Report on Archaeological Investigations, 2003. Unpublished report.
- Harris, J. 2009 Archaeological investigations at U14/2402, Tauriko: Final report. Unpublished report to New Zealand Historic Places Trust and Comanche Holdings Limited.
- Hoffmann, A. 2009 Archaeological investigation and monitoring of vegetation clearance and sand capping of T12/1035, Moanaanuanu Estuary, Beach Road, Whangamata. Unpublished report to New Zealand Historic Places Trust and the Whangamata Marina Society.
- Hogg, A. G. and J. D. McCraw 1983 Late Quaternary tephras of Coromandel Peninsula, North Island, New Zealand: a mixed peralkaline and calcalkaline tephra sequence. *New Zealand Journal of Geology and Geophysics*, 26: 163-187.
- Moore, P. R. 1999 Whangamata obsidian, Coromandel Peninsula. *Archaeology in New Zealand*, 42: 4, pp. 289-294.
- Short, S. 1988. Excavation of T12/654, Whangamata. Unpublished report.

APPENDIX A FEATURES

Feature	Area	Type	Description	Length (mm)	Width (mm)	Depth (mm)	Relationships
1	A	Midden	Dispersed crushed shell not thick deposit. Predominantly cockle and pipi. Inclusions: fire cracked rocks, obsidian flakes. Few features cut into it.			140 thick maximum	Overlies 32, cut by 4
2	A	Midden	Dense midden 100 mm below turf. Mostly whole and broken cockle with some pipi. Soil is dark brown with some scattered hangi stones.			80-120	Overlies 32
3	A	Pit	Large rectangular pit. Orange/brown loose volcanic soil fill with sparse shell, charcoal and stone inclusions throughout.				Overlain by 1, 32
4	A	Oven Scoop	Circular, sloping sides, scooped base. Fill largely whole cockles, some unopened. Also large pipis and some gastropod. One piece of paua shell on base. Both burnt and unburnt. Charcoal and oven stones.	600	(in baulk)	150	Cut into 1
5	A	Oven Scoop	Oval, scooped. Dark grey soil and mainly cockle shell fill. Oven stones and charcoal inclusions. Total sample to float for charcoal.	480	400	70	Cut into base of 1
6	A	Oven Scoop	Shallow oval scoop. Dark grey/black burnt shell (mainly cockle) and charcoal. One piece of obsidian				Cuts F1
7	A	Oven Scoop	Small scoop filled with dark grey ashy burnt shell and lots of charcoal. Oven stone inclusions.	500	350	80	Cuts base of F1
8	A	Post hole	Circular, mixed soil and shell midden fill.	90	70	120	Cuts base of F1
9	A	Post hole	Circular, filled with mixed soil and shell midden	50	40	60	Cuts base of F1
10	A	Post hole	Oval, bit irregular - post probably removed. Mixed soil and shell midden fill	110	60	60	Cuts base of F1
11	A	Oven Scoop	Circular, scooped sides and base. Fine, burnt and crushed cockle shell.	360	400	50	
12	A	Post hole	Circular, straight sides, hard edges base unclear – disturbed by roots. Dark soil fill with cockles and pipis.	300	270	260	Overlain by 1
13	A	Oven Scoop	Oval scoop. Grey ashy soil with burnt shell, charcoal. No obvious burning in base or oven stones.	530	300 (truncated)	110	Cuts into base of F1 and into fill of F3

Feature	Area	Type	Description	Length (mm)	Width (mm)	Depth (mm)	Relationships
14	A	Oven Scoop	Large oval scoop. Grey/brown ashy soil with burnt shell and charcoal	680	600	180	Cuts F13? Cuts 3
15	A	Post hole	Round. Filled with dark grey soil and fragments of shell.	130	150	200	Cuts F 14 and fill of F3
16	A	Oven Scoop	Circular scoop. Grey burnt ashy shell. Lots of charcoal, crushed shell and whole valves	850	750	150	Cuts base of midden cuts fill of F3
17	A	Oven Scoop	Large circular with clear cut, scooped sides and base. Whole cockle and pipi - some very dense shell fill, small amount of dark soil. No burning.	940	750	200	Cuts 32. Beyond the extent of f1
18	A	Post hole	Small, round stakehole. Grey fill with crushed shell.	50	40	80	Cut into base of 1
19	A	Oven Scoop	Small round scoop. Grey ashy fill with crushed shell and whole valves, charcoal	350	40	80	Cut into base of 1
20	A	Post hole	Small stakehole filled with grey crushed shell.	70	70	130	
21	A	Post hole	Small stakehole filled with grey crushed shell.	60	60	100	
22	A	Post hole	Small stakehole on 45 degree angle at edge of fire scoop (F16). Brown and white cockle valves.	90	70	170	Cut by F16
23	A	Post hole	Small stakehole	50	50	60	Cut by F16
24	A	Post hole	Small stakehole	60	50	160	Cut by F16
25	A	Post hole	Small stakehole	50	50	60	Cut by F16
26	A	Oven Scoop	Small round scoop. Brown, loose clean whole pipi, cockle valves	430	430	90	Cuts fill of 3
27	A	Oven Scoop	Circular, scooped sides and base. Cockle and pipi, dark soil. Disturbed by roots.	700	750	100	Overlain by 1, cuts 32
28	A	Oven Scoop	(Not excavated) Circular in plan. Loose brown soil with mainly broken pipi fill.	500	500	n/a	Possibly cuts 29. Cut into 32. Overlain by 1.
29	A	Oven Scoop	(Not excavated) Circular in plan. Light loose brown soil with mainly broken pipi fill.	400	400	n/a	Cut by 28, 30. Overlain by 2, cuts into 32

Feature	Area	Type	Description	Length (mm)	Width (mm)	Depth (mm)	Relationships
30	A	Oven Scoop	(Not excavated) Oval in plan. Loose brown fill with whole and broken pipi valves	650	500	n/a	Overlain by 1, cut into 32, cuts 29
31	A	Oven Scoop	(Not excavated) Crushed shell with dark brown soil.	700	700	n/a	Overlain by 1, cut into 32
32	A	Fill	Mixed brown fill with occasional shell. Some obsidian collected during digger monitoring.				
33	A	Oven Scoop	Circular base of a scoop. Dark soil with shell fill.	330	324	50	Overlain by 32
34	B	lens	Oval in plan but a lens with no cut. Dense burnt crushed shell.	1100	1380	150	Lens within 35
35	B	Fill	Mixed grey-brown soil with moderate shell fragments throughout.			200-580 mm thick	
36	B	Oven Scoop	Circular with straight sides. Filled with f35 material. Cut into loose lapilli.	360	370	240	
37	B	Oven Scoop	Oval, straight sides, scooped base. Dark black/grey fill with crushed shell - darker material than f35	510	410	50	
38	B	Post hole	Straight sides, circular. Dark black/grey fill, tiny amount of shell. Cut into soft lapilli.	150	160	100	Overlain by 35
39	B	Post hole	Circular, straight sides, tapered base. Cut into hard subsoil on slope above natural terrace. In alignment of 39-44	80	80	80	Overlain by 35
40	B	Post hole	Circular, straight sides, tapered base. Cut into hard subsoil on slope above natural terrace. In alignment of 39-45	120	120	180	Overlain by 35
41	B	Post hole	Circular, straight sides, scooped base. Cut into hard subsoil on slope above natural terrace. In alignment of 39-46. Small but clear.	60	60	40	Overlain by 35
42	B	Post hole	Circular, straight sides, tapered base. Cut into hard subsoil on slope above natural terrace. In alignment of 39-45	100	100	90	Overlain by 35
43	B	Post hole	Circular, straight sides, tapered base. Cut into hard subsoil on slope above natural terrace. In alignment of 39-45	200	200	240	Overlain by 35
44	B	Post hole	Circular, straight sides, tapered base. Cut into hard subsoil on slope above natural terrace. In alignment of 39-45	260	260	240	Overlain by 35
45	B	Post hole	Oval, straight sides, scooped base cuts into compact natural base. Fill is F35 material.	230	170	190	Overlain by 35

Feature	Area	Type	Description	Length (mm)	Width (mm)	Depth (mm)	Relationships
46	B	Post hole	Oval, tapering sides, scooped base cuts into compact natural base. Fill is F 35 material.	170	170	150	Overlain by 35
47	A	Oven Scoop	Shallow, roughly circular. Shell and yellow brown soil. Dug into lapilli. 600 mm below ground surface	200	280	50	
48	A	Oven Scoop	Shallow, no real definition, obviously several oven scoop events which merge into one and other. Shell and charcoal in dark yellow brown matrix. Dug into lapilli which appears burnt in places. 520 mm below ground surface.	1100	90	50-100	
49	A	Oven Scoop	Shallow scoop, roughly circular. Shell, land mixed grey-brown soil and lapilli. 490 mm below ground surface	220	280	50	
50	A	Bin Pit	Dug into lapilli slightly sloping inwards. Base is hard yellow-brown ash, sloping with hard surface. Fill is mixed yellow-brown lapilli, ash and brown loam. Dug from surface of lapilli, doesn't go into baulk.	600	530	250	
51	A	Pit	Vertical sides of lapilli. Base is hard ash with postholes dug into the surface. Doesn't go into baulk, so level at which it cut from unknown but adjacent pit, same fill, cut from underneath upper shell layer. Mixed lapilli and ash, brown with shell throughout fill.	1600	1540	220	
52	C	Scarp	Low scarp cut into compact yellow natural subsoil.			400	
53	C	Pit	Rectangular, cut into natural. Sides are fragile and collapsed. Fill is mostly mottled yellow/brown with a patch of very dark layer in top of fill. Some clean yellow fill from collapse of edges.	4200 (truncated - in baulk)	1250	450	
54	C	Pit	Rectangular pit cut into natural. Has irregular base when floor reaches lapilli layer. Goes into layer of fill. Fill is mottled yellow-brown with some lapilli inclusions.	2300	900	400	
55	C	Stake hole	Cut into natural. Light grey soil fill.	70	70	60	
56	C	Pit	Irregular pit, slightly oval with no flat base. (possibly tree root action?) Cut into natural. Filled with mottled yellow-brown soil.	800	700	200	
57	C	Pit	Void cut into base of face of scarp. Slight lip at entrance. Filled with loose mix of lapilli and yellow-brown soil.	580	500	300	Cuts 52

Feature	Area	Type	Description	Length (mm)	Width (mm)	Depth (mm)	Relationships
58	A	Pit	Rectangular pit, undercut in one corner. Goes back 300. Fill is brown mixed ash with shell	1100	1000	360	
59	A	Post hole	(not excavated) Circular, grey fill with shell.	130	130	n/a	
60	A	Post hole	(not excavated) Circular, grey fill with shell.	130	130	n/a	
61	A	Post hole	In base of pit 51	180	120	280	
62	A	Post hole	In base of pit 51	140	120	200	
63	A	Post hole	Oval, cut into coarse ash. Brown soil with shell fill.	340	300	120	
64	A	Post hole	Oval, cut into coarse ash. Brown soil with shell fill.	360	260	160	
65	A	Post hole	Oval, cut into coarse ash. Brown soil with shell fill.	360	260	180	
66	A	Post hole	Oval. Brown soil with shell fill.	430	280	200	Cuts into or cut by 67
67	A	Pit	Shallow rectangular pit. Filled with brown soil with shell mixed in	1150	900	100	
68	A	Pit	Large, rectangular pit filled with brown soil with shell mixed in.	3400	1750	700	
69	A	Board slot	Slot in corner of 68, posthole in base. Fill is brown soil with shell.	90	90	200	
70	A	Pit	Small rectangular pit, intercutting with features 68 and 78. Fill : brown with shell and mixed ash	n/a	970	280	
71	A	Oven Scoop	Round scoop cut into mottled surface below midden. On same level as pits.				
72	A	Post hole	Round, grey fill with shell				Cut into fill of 75
73	A	Post hole	Stakehole, grey fill with shell.	80	60	90	Cut into fill of 75
74	A	Post hole	(partially excavated) Grey fill with shell.				Cut into or truncated by 75
75	A	Pit	Small, roughly rectangular pit filled with brown soil with shell.	1300	400	250	
76	A	Post hole	Fill: dark brown with shell.	200	180	330	In base of 75
77	A	Post hole	Round. Dark brown soil with shell fill	140	130	110	

Feature	Area	Type	Description	Length (mm)	Width (mm)	Depth (mm)	Relationships
78	A	Pit	(partially excavated) Large shallow rectangular pit. Brown fill with shell	2400	1600	300	
79	A	Post hole	Posthole in base of 75. Dark brown fill with shell	250	250	500	
80	A	Post hole	Oval posthole, dark brown fill with shell	460	300	180	
81	A	Pit	Shallow rectangular pit with small rua cut into one end, running into baulk. Brown fill with shell. Rua opening 450 wide, 400 long, 550 deep, undercut only 200-250	460	300	180	
82	A	Post hole	Stakehole at side of pit in base. Fill: brown with shell	140	110	150	
83	A	Post hole	Stakehole at side of pit in base. Fill: brown with shell	110	100	140	
84	A	Post hole	In corner of F3. Brown fill with shell	130	130	n/a	
85	A	Pit	(not excavated) Small rectangular pit, shallow, cut by F3. Brown fill with shell	130	130	n/a	
86	A	Pit	(not excavated) Small rectangular pit, shallow, cut by F3. Brown fill with shell	1000	880	500	
87	A	Oven Scoop	(not excavated) Small patch of burnt soil - burnt red with white ash. Possibly the base of a scoop.	350	300	n/a	
88	A	Pit	(partially excavated) Rectangular pit, runs into baulk, one clear edge. Fill is brown with shell	n/a	n/a	250	
89	A	Post hole	(partially excavated) In base of F88. Dark brown with shell fill.	n/a	300	170	
90	A	Post hole	In base of 88. Dark brown fill with shell.	110	90	100	
91	A	Post hole	Just below base of midden. Cut into fill of F88. Grey soil fill with whole cockle valves	80	60	80	Overlain by 1
92	A	Post hole	Possible posthole cut into fill of 88, edges not very clear. Grey fill with whole cockle shells.	100	80	100	
93	A	Pit	Oval, slightly undercut along one side. Brown fill with shell.	700	630	500	
94	A	Pit - rua	Small rua with board slot at entrance, probably truncated. Chamber is 900 x 900 with roof sloping down to floor. Fill is brown with the occasional shell fragment.	1300	700	680	
95	A	Board slot	Slot for board or door at entrance to rua	700	70	70	

Feature	Area	Type	Description	Length (mm)	Width (mm)	Depth (mm)	Relationships
96	A	Post hole	Small stakehole at front of entrance to rua	70	70	100	
97	A	Post hole	Small stakehole at front of entrance to rua	70	70	60	
98	A	Post hole	Small stakehole at front of entrance to rua	70	70	80	
99	A	Pit?	Rectangular brown patch - end taken out but no clear walls or cut.			160	
100	D	Pit	Rectangular in shape with vertical sides - little sign of collapse, flat base cut into Andesite. Fairly loose medium brown sandy soil, more compact at base, some andesitic gravel inclusions	7500	4000	800	
101	D	Pit step	Ovoid in shape with curved sides. Same fill as pit - medium brown soft sandy soil.	800	500	170	Cut into base of 100
102	D		(Deleted)				
103	D	Post hole	Small posthole with straight sides cut into base of pit near edge. Fill as for pit.	100	100	160	Cut into base of 100
104	D	Post hole	Very small posthole cut into base of pit - crumbly sides, near corner of pit. Fill as for pit fill.	70	70	120	Cut into base of 100
105	D	Post hole	Round posthole cut into base and side of pit. Shallow. Fill as for pit.	150	120	50	Cut into base of 100
106	D	Post hole	Round posthole cut into base of pit. Tapering. Fill as for pit.	100	100	270	Cut into base of 100
107	D	Post hole	Round, straight sides, flat base.	150	150	320	Cut into base of 100
108	D	Post hole	Round, straight sides flat base.	160	140	270	Cut into base of 100
109	D	Post hole	Very small and shallow stake hole	30	30	50	Cut into base of 100
110	D	Post hole	Round, crumbled sides, flat base. Fill as for pit	250	200	300	Cut into base of 100
111	D	Post hole	Shallow scooped	160	140	80	Cut into base of 100
112	D	Post hole	Small with straight sides	80	60	100	Cut into base of 100
113	D	Post hole	Round with very straight sides. Not fully excavated	160	160	min. 180, not to base	Cut into base of 100
114	D	Post hole	Round with very straight sides. Not fully excavated	140	140	min. 150, not to base	Cut into base of 100

Feature	Area	Type	Description	Length (mm)	Width (mm)	Depth (mm)	Relationships
115	D	Post hole	Very small stake hole with tapering sides.	50	50	30	Cut into base of 100
116	D	Post hole	Round posthole with straight sides and flat base	200	170	300	Cut into base of 100
117	D	Post hole	Round with very straight sides. Not fully excavated	140	140	min. 150 not to base	Cut into base of 100
118	D	Post hole	Round posthole cut into Andesite base	100	100	140	Cut into base of 100
119	D	Post hole	Stake hole. Fill is pit fill	50	50	70	Cut into base of 100
120	D	Post hole	Stake hole. Fill is pit fill	50	50	60	Cut into base of 100
121	D	Post hole	Round posthole. Fill is pit fill	80	80	80	Cut into base of 100
122	D	Post hole	Stake hole. Fill is pit fill	50	50	60	Cut into base of 100
123	D	Post hole	Round posthole. Fill is pit fill	150	150	min. 150 not to base	Cut into base of 100
124	D	Post hole	Round posthole. Fill is pit fill	120	120	min. 120, not to base	Cut into base of 100
125	D	Post hole	Round posthole. Fill is pit fill	180	180	320	Cut into base of 100
126	D	Post hole	Round posthole. Fill is pit fill	140	140	min. 150 not to base	Cut into base of 100
127	D	Post hole	Shallow round posthole. Fill is pit fill	110	110	60	Cut into base of 100
128	D	Post hole	Round posthole. Fill is pit fill	150	150	60	Cut into base of 100
129	D	Bin Pit	Round pit cut by side of feature 100 straight sides, curved base. Fill is similar to pit fill - it has loose brown sandy soil with darker material in the top from root trace.	650	450	330	Cut by 100
130	D	Post hole	Horizontal posthole/beam slot in south wall of pit. Cut is oval, has hard, clear edges. Base is at level of pit base. Tapers to end. Fill is soft, loose and the same as the pit fill.	150	100	400 (horizontal)	Cut into side of 100

Feature	Area	Type	Description	Length (mm)	Width (mm)	Depth (mm)	Relationships
131	D	Post hole	Ovoid horizontal posthole/beam slot. Cut into side of pit in se side near step. Above level of the base of the pit - about middle of wall height, at same level as base of step. Fill - hard layer of compacted pit fill covered its opening but inside was soft material the same as the rest of the pit fill.	200	150	500 (horizontal)	Cut into side of 100
132	B	Post hole	Visible in trench profile of Area B. Has curved sides and base. Cut into the loose lapilli layer. Doesn't continue into hard subsoil.	n/a	n/a	230	
133	B	Oven Scoop	Visible in trench profile of Area B. Scooped sides and base, Fill is dark mottled soil that is darker than F35. Has charcoal-stained appearance but is mottled with brown soil.	n/a	n/a	200	
134	B	Shell lens	Thin lens of finely crushed shell and dark, charcoal- stained soil over small portion of the front scarp of the terrace visible in Area B trench profile.	n/a	n/a	40	

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Report on Radiocarbon Age Determination for Wk- 27921

Submitter L. Furey
Submitter's Code T12-1084_10
Site & Location Whangamata, Coromandel Peninsula, New Zealand
Sample Material Cockle Shell
Physical Pretreatment Surfaces cleaned. Washed in an ultrasonic bath. Tested for recrystallization: aragonite.
Chemical Pretreatment Sample acid washed using 2 M dil. HCl for 200 seconds, rinsed and dried.

$\delta^{13}\text{C}$	1.3 ±	0.2 ‰
D ¹⁴ C	-78.2 ±	4.0 ‰
F ¹⁴ C%	92.2 ±	0.4 %
Result	654 ±	35 BP

Comments

Alan Hogg

26/5/10

- Result is *Conventional Age or Percent Modern Carbon (pMC)* following Stuiver and Polach, 1977, Radiocarbon 19, 355-363. This is based on the Libby half-life of 5568 yr with correction for isotopic fractionation applied. This age is normally quoted in publications and must include the appropriate error term and Wk number.
- Quoted errors are 1 standard deviation due to counting statistics multiplied by an experimentally determined Laboratory Error Multiplier.
- The isotopic fractionation, $\delta^{13}\text{C}$, is expressed as ‰ wrt PDB.
- F¹⁴C% is also known as *Percent Modern Carbon (pMC)*.

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Report on Radiocarbon Age Determination for Wk- 27922

Submitter	L. Furey
Submitter's Code	T12-1084_19
Site & Location	Whangamata, Coromandel Peninsula, New Zealand
Sample Material	Cockle shell
Physical Pretreatment	Surfaces cleaned. Washed in an ultrasonic bath. Tested for recrystallization: aragonite.
Chemical Pretreatment	Sample acid washed using 2 M dil. HCl for 100 seconds, rinsed and dried.

$\delta^{13}\text{C}$	1.4 \pm	0.2 ‰
D ¹⁴ C	-78.7 \pm	4.0 ‰
F ¹⁴ C%	92.1 \pm	0.4 %
Result	658 \pm 35 BP	

Comments

Alan Hogg

26/5/10

- Result is *Conventional Age or Percent Modern Carbon (pMC)* following Stuiver and Polach, 1977, Radiocarbon 19, 355-363. This is based on the Libby half-life of 5568 yr with correction for isotopic fractionation applied. This age is normally quoted in publications and must include the appropriate error term and Wk number.
- Quoted errors are 1 standard deviation due to counting statistics multiplied by an experimentally determined Laboratory Error Multiplier.
- The isotopic fractionation, $\delta^{13}\text{C}$, is expressed as ‰ wrt PDB.
- F¹⁴C% is also known as *Percent Modern Carbon (pMC)*.

