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EXCAVATION OF UNDEFENDED SITE R10/494 ON MOTUTAPU ISLAND, NEW ZEALAND

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Site R10/494 is located in the north-east of Motutapu Island, Hauraki Gulf (Figure 1), and was excavated during a University of Auckland Department of Anthropology archaeological field school from 19 January to 3 February, 1998. The excavation was directed by Thegn Ladefoged and Rod Wallace, with assistance from Blaze O'Connor and 15 undergraduate students, and was part of a larger project initiated by Geoff Irwin. The site consisted of an undefended kāinga situated on a north facing ridgeline immediately above a small flat bottomed valley whose stream drains into Sandy Bay some 300 m to the west. The primary objective of the fieldwork was to investigate the intra-site spatial patterning of features and artefacts within an undefended Maori ridgeline site.

The site included several pits and terraces (Figure 2), although the boundary between these features and a number of adjacent pits and terraces recorded as other sites is somewhat ambiguous. Three features within R10/494 were excavated. Feature 1 was a ca. 10.8 by 7.4 m terrace on which was found the remains of a house. Feature 2 was a larger terrace that contained a ca. 5.4 by 3 m kūmara storage pit. Feature 3 was a ca. 20 by 4.3 m terrace that probably functioned as a cooking area. These features were excavated according to natural and cultural stratigraphic layers, with 10 cm levels subdividing layers when necessary. The provenience of artefacts was recorded in situ when possible, with excavated sediment sieved through 7 mm to 3.7 mm mesh screens to recover additional artefactual and ecofactual material. The details of the excavation are reported in Ladefoged and Wallace (2009), and the main findings are presented below.

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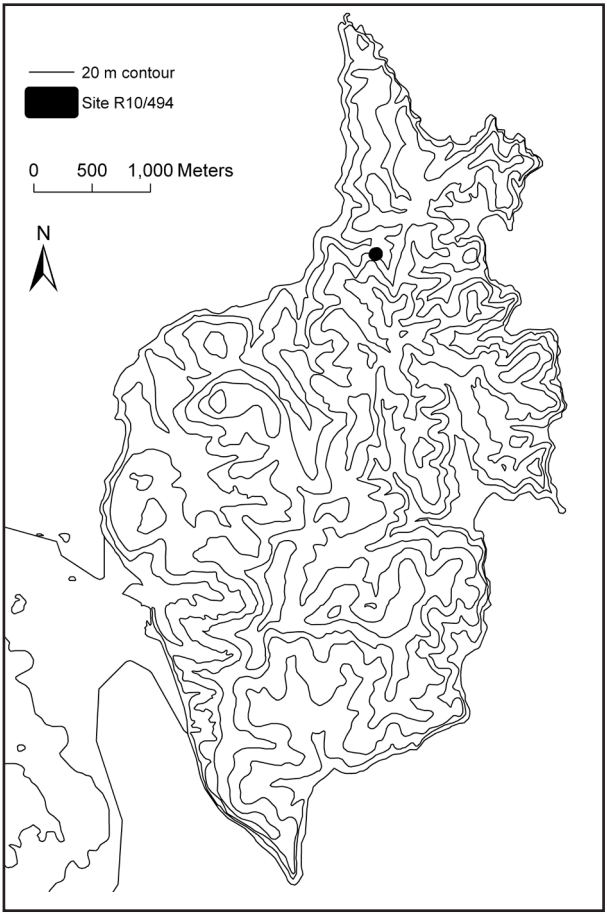

Figure 1. Location of R10/494 on Motutapu Island.

Feature 1

Forty-eight square metres were excavated on Feature 1 (see Figure 3 and Singh (1998)). The stratigraphic profile from unit (10, 7) to unit (10, 14) shows the construction of the residential terrace and subsequent depositional episodes (Figure 4). The lowest layer is a culturally sterile clay deposit (Layer 10) cut into on the southern upslope side during the construction of the terrace. Charcoal samples from landscape fires associated with the initial eruptive phase of the Rangitoto volcano were found at the top of this layer just east of the feature, and consisted entirely of hard beech (*Nothofagus truncata*). The Rangitoto ash

deposits (Layers 8 and 9) were removed during the construction of the feature and were redeposited as fill to form the front of the terrace. Figure 3 shows the outline of the house built on this terrace and some of the larger cultural items associated with this occupation.

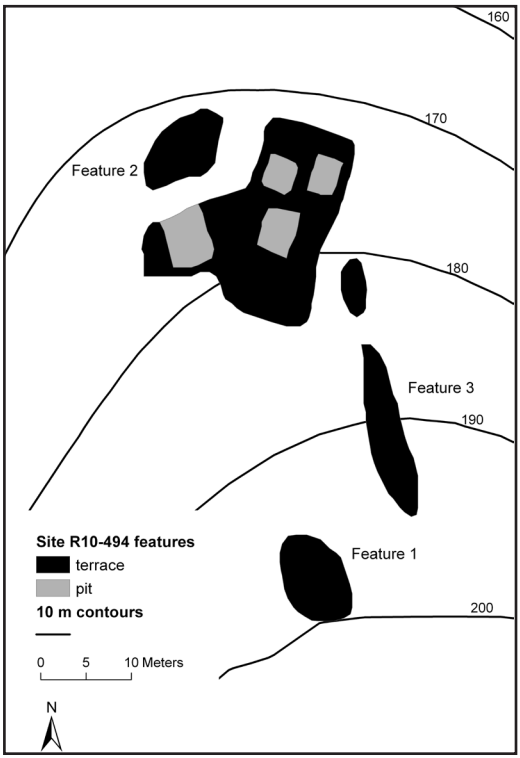

Figure 2. Surface features of R10/494.

The main cultural deposit (Layer 5) of the feature had a maximum thickness of only ca. 20 cm. Despite the absence of combustion components in direct association with the cultural layer, the presence of abundant charcoal from the layer suggested the structure or vegetation on this surface had been destroyed by fire at some point. Over 40% of the charcoal was from the large forest canopy forming species tōtara (*Podocarpus totara*), rimu (*Dacrydium cupressinum*), mataī (*Prumnopitys taxifolia*) and kauri (*Agathis australis*). These species were most abundant in post holes but occurred nowhere else in the site and are interpreted as remains of burnt house timbers. In sharp contrast, the

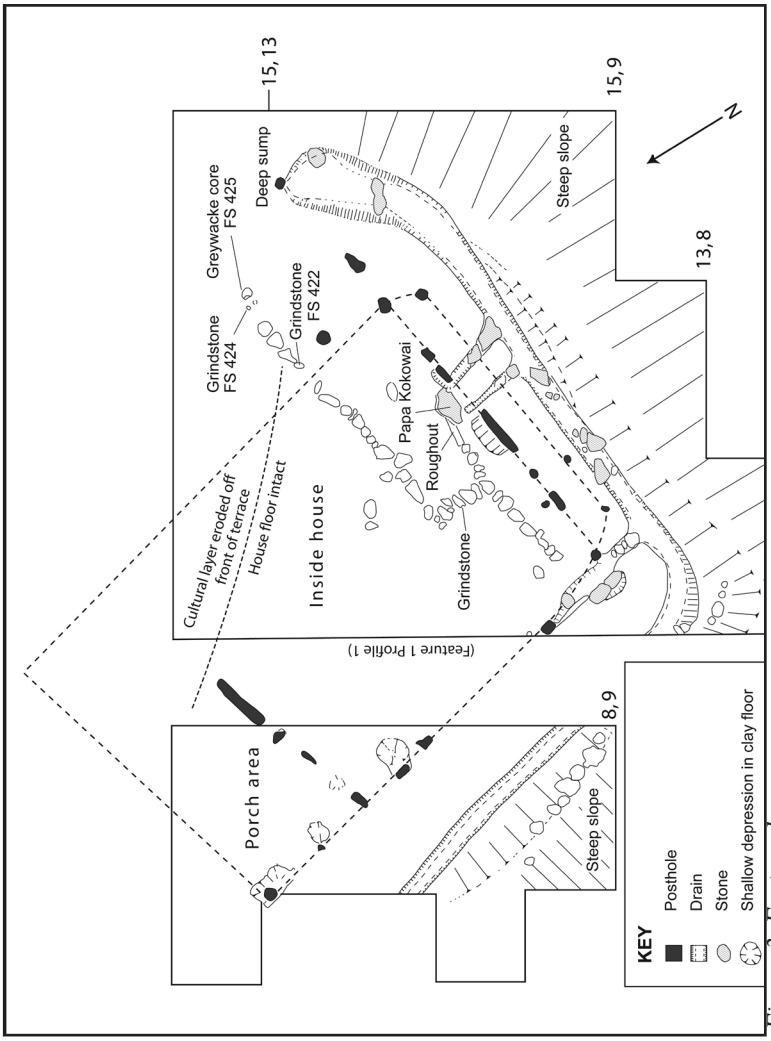

Figure 3. Feature 1.

remainder of the charcoal is dominated by bracken (*Pteridium esculentum*), tutu (*Coraria arborea*), hebes (*Hebe* spp.), coprosmas (*Coprosma* spp.) and mānuka (*Leptospermum scoparium*), all small shrub species typical of vegetation that colonises disturbed ground. This mixture of house timber species with regrowth shrub species suggests the charcoal was from fires that occurred a reasonably short time after the site was abandoned.

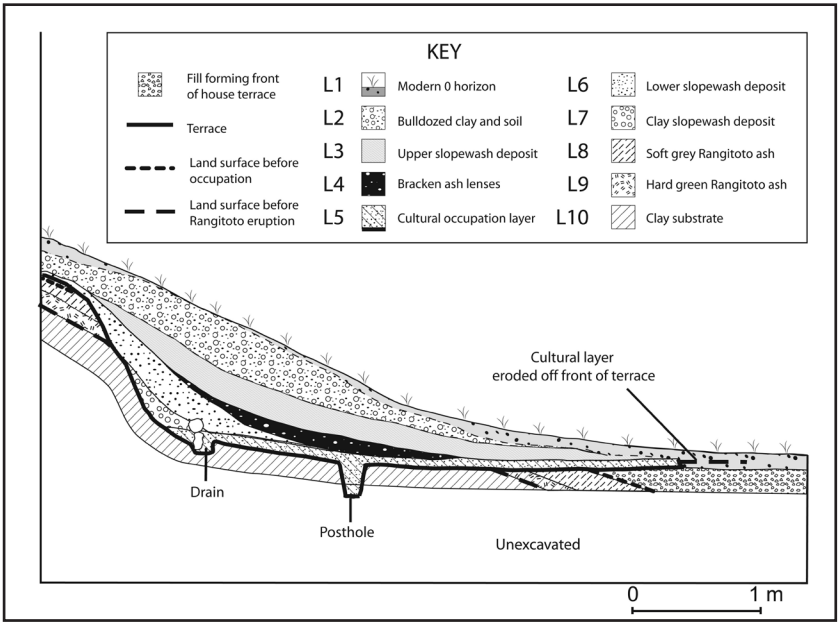

Figure 4. Feature 1, west profile.

The occupation layer was overlain by a series of naturally deposited layers. The first was slumped clay and soil eroded from the steep scarp at the back of the terrace that filled in and covered the drain at the back of the house (Layer 7). This contained abundant hard beech charcoal clearly eroded from an eruption era burn layer exposed in the scarp immediately above. This in turn was covered by multiple layers of mixed slope-wash sediment (Layer 6), the upper part of which contained a series of ash lenses (collectively shown as Layer 4 in Figure 4) that represent a minimum of four burning events that occurred in reasonably quick succession. These contained only bracken fern (*Pterdium esculentum*) charcoal, presumably from fires of vegetation that had grown on the feature some time after the abandonment of the site. These ash

layers were capped by a buried soil horizon (Layer 3) that developed on the slope-wash deposits. This was in turn buried by the mixed clay and ash (Layer 2) associated with World War II era military activities with a O horizon modern topsoil (Layer 1).

The plan of Feature 1 (Figure 3) depicts a series of drains, rock alignments and post holes that clearly define the outline of a house. A main drain extended along the back of the house with a long arm down the western side and a shorter eastern extension ending in a sump. Three smaller drain branches led from the back wall of the house to the main drain. The house floor had several shallow slots filled with unmodified stones, water-rolled cobbles with ground facets and a greywacke core. Their function is unknown, although they might have defined activity areas or were part of a drainage system. An alignment of larger rocks to the west of the west drain appears to have functioned as a retaining wall to stop sediment slope-wash accumulation in the drain.

A series of post holes define the walls of the house. The back wall had a double row, a close set inner row of major posts and an outer row of light poles that probably held the back wall insulation in place, a construction style well documented elsewhere in New Zealand (Davidson 1984: 156; Prickett 1990: 144; Wallace and Irwin 1999: 122-148). The western wall of the house is clearly defined by a series of post holes cut into the Layer 7 clay substrate. The eastern wall was on the section of terrace formed from loose redeposited Rangitoto ash fill in which only a single post hole was able to be located. The front wall of the house was formed from squared timbers, the central one of which was evidenced by a large (ca. 65 x 14 cm) rectangular post hole. This post hole corresponds to a second large (ca. 58 x 12 cm) rectangular post hole in the back wall of the house, and the pair probably held timber slabs that supported the ridgepole. The internal dimensions of the house were ca. 4 m long by 3.1 m wide, with a porch extending the length by another 1.6 m. This creates an overall length to width ratio of ca. 1.8:1, which as noted by Singh (1998: 10), fits within the ratios of 1.5:1 to 2:1 described by Prickett (1982: 119) as typical of Maori whare. The porch contained a dense concentration of artefacts that indicated an important activity area.

Artefactual material from Feature 1

A considerable amount of artefactual material was recovered from Feature 1. Billot (1998) provides an analysis and summary of these and Cronquist (1998) and Moore (1998) provide a detailed analysis of the obsidian.

Pendants and comb

A burnt hair comb (heru) made from mānuka wood was recovered from beside the centre post of the back wall of the house. It had seven teeth, five broken or burnt off at the base. As it is approximately 2.25 cm in length and 2.0 cm in width, Billot (1998: 3) notes it is small in relation to the combs from Kauri Point (Shawcross 1964), Oruarangi (Furey 1996), the Waitakere Ranges rock shelters (Lawrence 1990) and Kohika (Wallace and Irwin 2004). The comb has a curved end top that Billot (1998) suggests matches the later style at Kauri Point (Shawcross 1964). Two pendants were also recovered from Feature 1, one a drilled scallop shell (*Pecten novaezelandiae*) and the other a drilled fossil shark's tooth.

Lithics

A total of 802 lithic artefacts were recovered from Feature 1. The largest was a papa kōkōwai or ochre grinding stone found in situ close to the rear wall centre post hole. It was a 49.5 cm long by 22-28.1 cm wide by 0.39-2.81 cm thick slab of andesite similar to material found in the Hunua Ranges and the Thames area (Furey pers. comm. cited in Billot 1998: 5) with distinct red staining on its upper surface. In addition, 19 broken pieces of another papa kōkōwai were recovered from the house floor. Also recovered were six water-worn greywacke cobbles with grinding facets, five with ochre staining, that were presumably associated with use of the papa kōkōwai.

Three sandstone grinders (hōanga) with grooves, all thought to be of local Motutapu rock, were recovered from outside the house. Two (FS 145 and FS 156) are quite small and were probably handheld tools, perhaps used to smooth fish hooks or bird spears (Billot 1998: 7; and see Hamilton 1972 and Furey 1996). The third sandstone grinder is much larger, and might have been used in the construction and maintenance of various items such as needles, adzes, chisels and fishhooks (Billot 1998: 11). In addition, Feature 1 yielded a small greywacke adze fragment along with a greywacke core and seven greywacke flakes. Three hammerstones were also found, two made from greywacke cobbles and a third from red chert.

A total of 758 pieces of obsidian were recovered from Feature 1, with 692 found on the house floor itself with the others in the slopewash deposits. 238 were classified as "shatter", 374 as "flakes", and 80 defined as "cores" (Cronquist 1998; Moore 1998). The obsidian was assigned on visual criteria to two general sources with Great Barrier Island (n=608, or 87.9%) dominating over Mayor Island (n=84, or 12.1%). In addition, two pieces of grey-black obsidian tentatively sourced to Huruiki were recovered from the Layer 3 (which overlay the main cultural layer of Feature 1). The spatial distribution of the

obsidian from the cultural layer shows a distinct pattern, with 313 of the 692 pieces being associated with the porch of the house.

Faunal material from Feature 1

The faunal material recovered from Feature 1 was analysed by Carpenter (1998), and Walter (1998). The remains were divided into three broad taxonomic groupings (mammal, bird and fish), with further classification occurring where possible. The faunal material is reported as the Number of Identified Specimens (NISP) and the Minimum Number of Individuals (MNI). The main cultural layer (Layer 5) contained dog, rat, bird and a range of fish (shark, gurnard, trevally, kingfish and snapper). The 26 pieces of dog faunal material from the cultural layer indicate an MNI of 4, with the recovery of 5 mandibles (two of which were matching), 12 teeth, and eight metacarpals/tarsals. The recovered dog elements are not representative of a full skeletal complement, as there are no remains of any long bones, vertebrae or crania. Carpenter (1998: 14) suggests this is at odds with the dog assemblage from nearby Pig Bay, where all elements were represented in all levels (Smith 1981: 98). As such, it is possible that the dog remains from Feature 1 do not reflect food processing activities, but rather were the result of manufacturing ornaments or fishhooks (Carpenter 1998; and see Davidson 1984; Allo 1970). Thirty-four rat bones representing most of the major skeletal elements were recovered from the fill of a post hole and indicate a single individual. The remaining rat bones were from the fill of the back drain, and could represent a second individual. Nine pieces of bird bone were recovered from the cultural layer. These included a femur, two fragments of tarsometatarsus, and a fragment of tibiotarsus, all of which have been tentatively identified as shags (Pelicaniformes). The remaining five pieces of bird bone include a vertebra, two different sized femurs, one from a smallish bird and the other from a medium-sized bird, a tibiotarsus from a larger bird and an unidentified long bone. It is notable that, with the exception of the vertebra, all of the bird bone remains are from the legs of birds, perhaps suggesting artefact manufacturing rather than diet (Carpenter 1998:15). The fish remains from the feature include gurnard (Cheolodonicthys kumu; NISP=2), trevally (Pseudocaranx dentex; NISP=1), kingfish (Seriola lalandi; NISP=2) and snapper (Pagrus auratus; NISP=5).

Shellfish material from Feature 1

The shellfish remains from Feature 1 were analysed by Low (1998), Phear (1998) and Szabo (1998, 1999, 2001). Most of the shell recovered from Feature 1 was associated with the northeast end of the drain and sump (units 14, 11; 14, 12; 15, 11; 15, 12) and it is entirely possible it was redeposited there

by downslope movement. The minimum number of individuals was established for each species (see Szabo1998, 1999, 2001 for details). Sixteen shell species were identified, with the soft shore species tuatua (Paphies subtriangulata) and scallop (Pecten novaezelandiae) dominating the assemblage.

Feature 2

The surface of the Feature 2 terrace was relatively flat, with no depressions or pits (Figures 2 and 5).

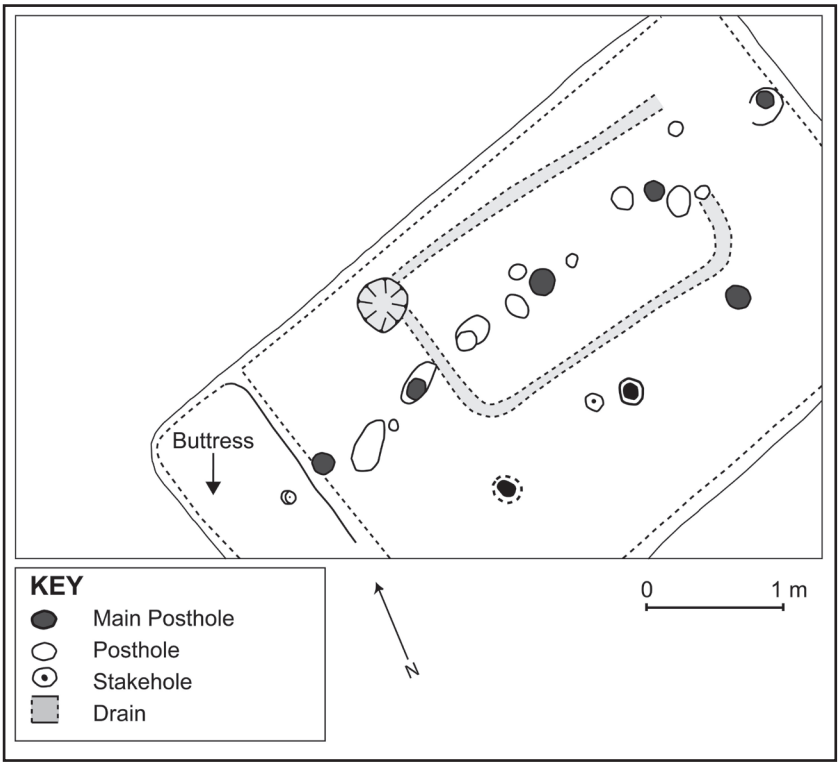

Figure 5. Feature 2.

Test excavations revealed the northern part of the area had a topsoil layer directly on a flat clay substrate with no volcanic ash at all, strongly suggesting the surface had been truncated, possibly during World War II era bulldozing. Excavation of the southern portion revealed a ca. 5.4 by 3 m infilled kūmara pit dug into the culturally sterile Layer 7 clay (see Figure 5 and Jamieson 1998

for details). The profile (Figure 6) shows the base of the pit had a thin ca. 3 cm compact grey-black deposit (Layer 6) on which was a burn layer (Layer 5) containing patches of bracken charcoal. This suggests the abandoned pit had been left open long enough for bracken cover to develop and be burnt before infilling occurred. The pit had been back filled with clay chunks (Layer 4), clearly the result of a single episode. As this fill layer settled a hollow formed in the top on which a ca. 10 - 15 cm palaeosol (Layer 3) developed on which were multiple ash lenses containing bracken and hebe charcoal (Layer 2). Layer 2 was buried by more recent slope-wash (Layer 1) on which had developed a modern top soil. Excavations revealed 21 post holes in the base of the pit, eight of which probably held substantial posts in two parallel rows. Drains had been cut into the floor and led to a sump, with a step at the eastern end indicating the entrance.

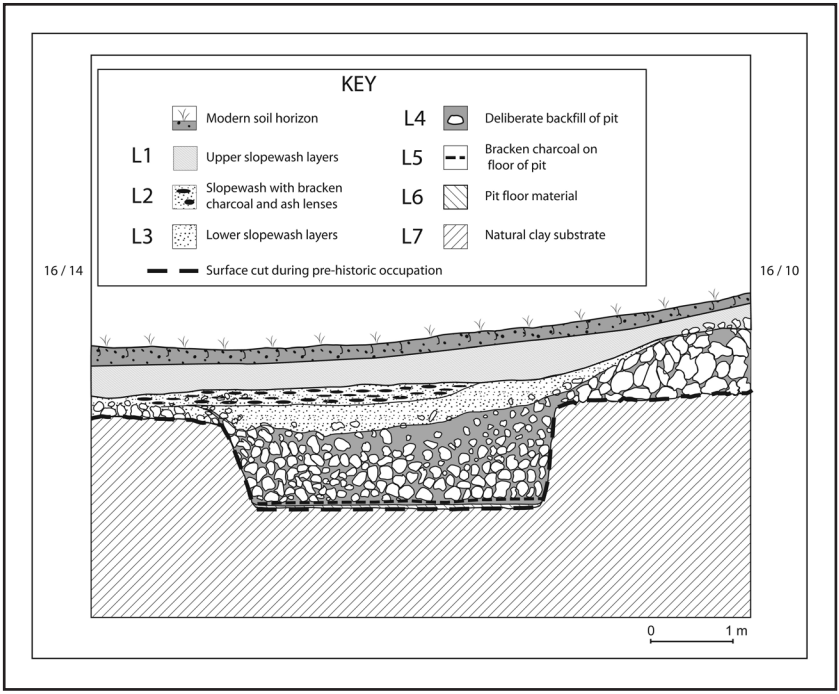

Figure 6. Feature 2, profile.

Material from Feature 2

The deeper fill of the pit (Layer 4) and the palaeosol (Layer 3) contained two black chert fragments, two greywacke cores, 18 greywacke flakes, several small pieces of greywacke shatter and a piece of unworked chert. The fill also contained shell fragments of pipi (*Paphies australis*; MNI=64) and tuatua (*Paphies subtriangulata*; MNI=43). As all of this material came from the Layer 3 and 4 fill of the feature, it is associated with activities in adjacent areas rather than the use of the pit for kūmara storage.

Feature 3

Feature 3 is a ca. 20 by 4.3 m terrace located downslope and to the northeast of Feature 1 (Figure 2). It had surface evidence of concentrated shell midden and oven stones suggesting food preparation and cooking activities. A 50 cm by 8 m trench was dug at the north end of the feature to expose the stratigraphy across the terrace and to collect midden samples. The profile shown in Figure 7 shows the standard natural stratigraphy of a clay base (Layer 7) overlaid by the two ash layers from the Rangitoto eruption (Layer 6). The same cut-and-fill method of terrace construction as in Feature 1 was employed with material removed from the upslope western end and deposited to form the front of the terrace (Layer 4). On the terrace surface the main cultural layer (Layer 3) consisted of mixed fire-cracked rock, charcoal and shell midden overlaid by a thinner layer (Layer 2) containing lower densities of shell. This was, in turn, overlaid by more recent sheet-wash sediments containing sparse shell and oven stones (Layer 1).

Material from Feature 3

The faunal material from Feature 3 consists of small amounts of fish bone (gurnard (NISP=14), jack mackerel (NISP=1) and snapper (NISP=69)), and rat (NISP=1) (Carpenter 1998 and Walter 1998). In contrast to the paucity of fish remains, Phear (1998), Low (1998) and Szabo (1998, 1999, 2001) note that the Feature 3 midden contains a considerable amount of shellfish (total NISP=2966). Their analysis suggests that 47 different species were present, although it is dominated by cat's eye (*Turbo smaragdus*), pip (*Paphies australis*), tuatua (*Paphies subtriangulata*), and cockle (*Austrovenus stutchburyi*).

The charcoal assemblage from Feature 3 is likely to have come primarily from firewood collected from local vegetation during occupation. It is dominated (60% of the total) by three small woody shrubs, tutu, hebe and coprosma along with some larger shrub and scrub species. There was a single occurrence of beech charcoal but this was from Layer 4 under the midden where the eruption era palaeosol had been exposed during terrace construction.

The only trees species in the assemblage are pōhutukawa and pūriri which are also the only native trees still common on the modern landscape, currently growing on the coastal cliffs only 300 m west of the site. At the time the site was occupied the local woody vegetation consisted of shrub species surviving in an open landscape probably dominated by bracken and maintained in this state by intermittent burning.

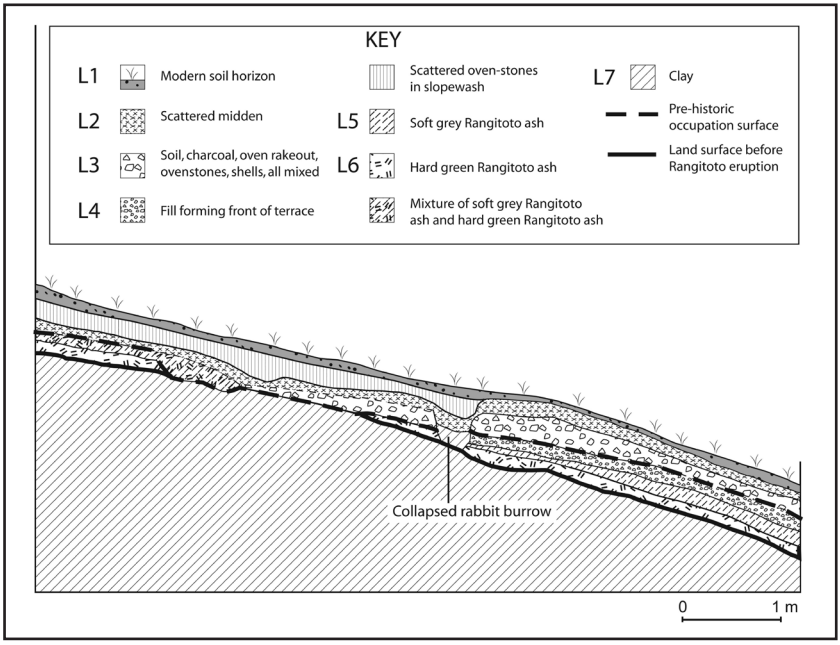

Figure 7. Feature 3, profile.

Comparison of shellfish remains from the three features

In total, 49 species of shellfish are represented in the assemblages from Features 1, 2, and 3. Szabo (2001: 81) notes that 22 of these species would have derived from the soft shore, with 27 from the rocky shore. She suggests that "the large number of species...points to an indiscriminate method of shellfish gathering, and as such can be seen as fine-grained – that is, a reflection of the species available in the proportions that they are available" (Szabo 2001: 81). Szabo (2001) notes that no black nerite (*Nerita atramentosa*) were recovered from the site, although it is abundant throughout the rocky shores of Auckland and Northland, and today present on Motutapu Island. Szabo (2001) attributes

this absence to climatic changes that have occurred over the past few centuries. *Nerita* thrives in warmer waters and a drop in mean water temperature would have significantly affected its feeding and respiratory functions. By comparing the R10/494 assemblages to assemblages from other archaeological sites on Motutapu, Szabo (2001:83) concludes that *Nerita atramentosa* was present when the Sunde site was occupied in the mid-14th century, disappears from the record during the occupation of R10/494, and then has recolonised the island sometime after ca. A.D. 1630 when N38/37 was occupied. Szabo (2001) suggests the changes to the assemblages are a function of climatic variation, as opposed to cultural variation in resource exploitation practices, identification errors, or taphonomic processes.

Conclusions

Site R10/494 was a complex of terrace and pit features that represent an undefended kāinga on the northeast of Motutapu Island. Feature 1 of the site was a reasonably large house constructed from dressed timbers transported to the site for the purpose, possibly from a considerable distance or even from Waiheke or the mainland. It had internal and external drains, substantial walls and roof, and contained a range of artefacts indicating that it was intensively occupied for a significant period, possibly several seasons. The most striking feature of the house was the large papa kōkōwai or ochre grinding stone found set in the floor accompanied by broken pieces of a second papa kōkōwai and six pestle like ochre-stained objects that presumably were used with the papa kōkōwai.

The spatially associated kūmara pit (Feature 2) was also well-constructed, with a step and a series of internal drains. It had been used then abandoned till bracken grew on it and was burnt, after which it was deliberately backfilled. Feature 3 appears to be a cooking or food preparation area, with a considerable amount of shellfish midden but only a small quantity of fish remains. The charcoal data show a landscape that had been cleared of forest well prior to occupation and was repeatedly burnt after the site was abandoned. The lack of *Nerita* in the midden provides a clue to the temporal association of the feature, with Szabo (2001: 83) estimating that it was likely occupied sometime in the 15th to 16th centuries. In sum, excavations at the three features provide glimpses into the lives of the people who gardened and lived on the island.

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