Azimuth Estate, 297C Main Road, Tairua (HNZPTA authority 2017/023): final excavation report

report to
Heritage New Zealand Pouhere Taonga
and
Thames–Coromandel District Council

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Introduction

Sky Mason Developments undertook a subdivision of the Azimuth Estate, 297C Main Road (State Highway 20), Tairua (Lot 1 DP 374709) prior to going into liquidation in 2019. By that time earthworks for the development were largely complete and Thames–Coromandel District Council took over enabling works. There are 14 archaeological sites recorded in the New Zealand Archaeological Association (NZAA) Site Recording Scheme (SRS) on the property, which is located within a rich archaeological landscape, An archaeological assessment of effects was prepared by CFG Heritage (Campbell and Cruickshank 2014) and Sky Mason applied to Heritage New Zealand Pouhere Taonga (HNZPT) for an archaeological authority under section 44 of the Heritage New Zealand Pouhere Taonga Act 2014 to damage or destroy archaeological sites on the property during subdivision. Archaeological authority 2017/023 was granted on 11 August 2016 and monitoring and investigation were carried out between September 2016 and October 2017. Installation of retaining walls by Thames–Coromandel District Council was monitored in November 2020.

Environment

Tairua sits at the mouth of the Tairua River, with its headwaters originating in the Coromandel Ranges. These ranges consist of a greywacke basement rock, with andesitic and rhyolitic volcanic eruptions dating from the Miocene and Pliocene forming the landscape that dominates the peninsula (Barker 1992; Homer and Moore 1992). These later rhyolitic eruptions are responsible for much of the high quality lithic resources that made the Coromandel Volcanic Zone a major source of obsidian and basalt for tool manufacture (Turner 2000: 271).

Azimuth Estate sits on a south-east trending spur that terminates to the west of Tairua township. To the south of the property is the Pepe Creek and estuary, and the north is Grahams (Waitoko) Creek. The property was, prior to development, a mixture of pasture, pine plantation and scrub, with patches of invasive gorse.

Soils are Mangonui hill soils, sandy volcanic ashes that are partly podzolized, well drained, prone to slipping and of medium to low fertility. The original vegetation would have been a mosaic of kauri and other podocarps, broadleaves and scrub. These soils would not have been ideal for pre-European Māori kūmara horticulture (DSIR 1954).

Land ownership

The property sits within a block of land historically known as Grahams Grant (Figure 2). This land was officially granted on 6 April 1864 by the Crown and covered 1650 acres, encompassing the area in which Tairua is located today. Much of the property was sold to the Kauri Timber Company during the 1870s and was eventually conveyed to The Union Steam

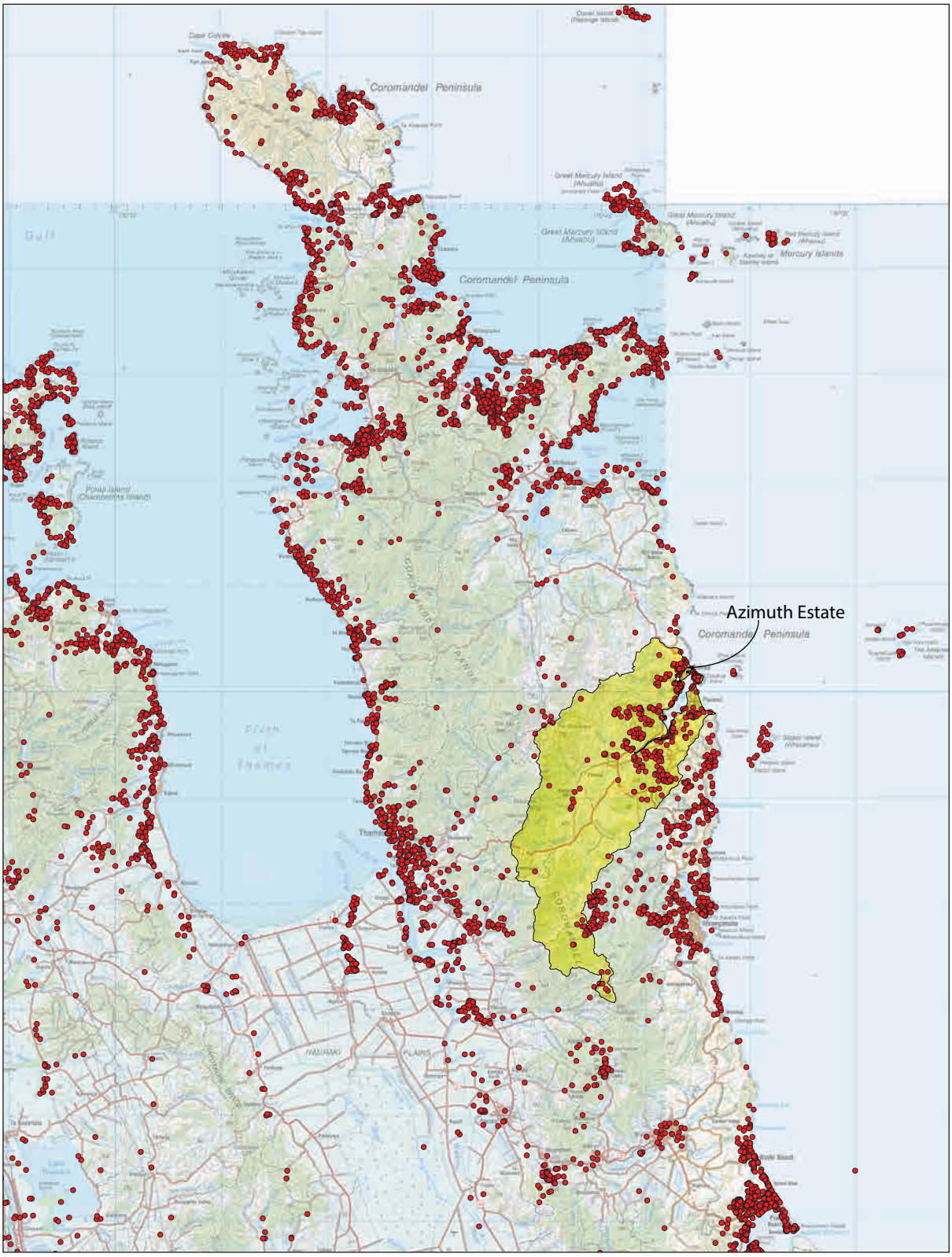

Figure 1. Location of Azimuth Estate in the Tairua Catchment.

Figure 2. SO 167, Plan of Land at Tairua Situated in the Bay of Plenty, *dated 1861, showing Grahams Grant.*

Saw Moulding Sash and Door Company (USSMSDC) in 1877. Most of the land surrounding Tairua was bought by the Cory-Wright Family in 1889 from the USSMSDC after it went into liquidation (Bennett 1986: 123). The area appears to have been subdivided in 1948 (SO 35358), when farm lots were sold off. Since then the lots have been subdivided and much of the waterfront property is now housing.

Summary of assessment

The subdivision was assessed by CFG Heritage Ltd (Campbell and Cruickshank 2014) prior to works beginning. The property had been heavily modified, with access tracks cut into the top of the main ridge and an old overgrown track cut down the central ridge. Aerial photographs show this track was the old driveway for the house, prior to the easier gradient driveway being constructed in the 1980s. On the northern face of the property was a large pine plantation of largely unmerchantable trees, which were subsequently felled, and milled on site for firewood. A number of landslips had occurred on the property, which exposed several middens.

There were six middens previously recorded by Diamond (1979) on the property, none of which had been revisited by an archaeologist prior to the assessment. Three of these sites, T11/271, T11/273 and T11/281, were relocated during the survey, along with T11/283 which had previously been recorded outside the property, while T11/272, T11/277 and T11/282, were not relocated. T11/277 was most likely obscured by the pine plantation located on the northern face of the property. During the assessment a further six middens were recorded (T11/1052, T11/1053, T11/1054, T11/1055, T11/1056, T11/1057).

The Tairua archaeological landscape

This analysis of the Tairua archaeological landscape is based on the Tairua River catchment, the extent of which was calculated by Ben Jones of Isthmus Archaeology in ArcGIS. In order to capture the Pāuanui sandspit the small stream that drains into the ocean at the south east of Pāuanui was also included (Figure 3).

Records of previous archaeological field surveys and investigations were accessed from the HNZPT digital library. While there are numerous reports associated with the Tairua catchment, many of these are of limited value, for instance early reports are often inventories of sites with little description or analytical value, or pre- or post-harvest site inspections outlining pine plantation harvest methods to avoid site disturbance.

Previous excavations

The Coromandel has long been a focus of research into the early archaeology of the North Island. As early as 1979 Davidson listed 14 sites that had been investigated, all located on the ocean-facing east coast of the peninsula, and several have been excavated since. Early excavations at Otama and Ōpito on the Kūoatunu Peninsula were formative in Golson's (1959a, 1959b) initial outline of New Zealand prehistoric sequence.

Few archaeological investigations have been reported in Tairua (Figure 4). The best known and most significant is a site known simply as the Tairua site (T11/62), located on the sand spit connecting Paku to the mainland, which was excavated over several seasons in the late 1950s and early 1960s by Roger Green, Colin Smart and Bob Jolly. Layers 2, 4, 6 and 8 were the cultural layers, each separated from the other by clean dune sand. The early period layer is Layer 2, which was where a pearl shell lure was found during the 1964 excavations

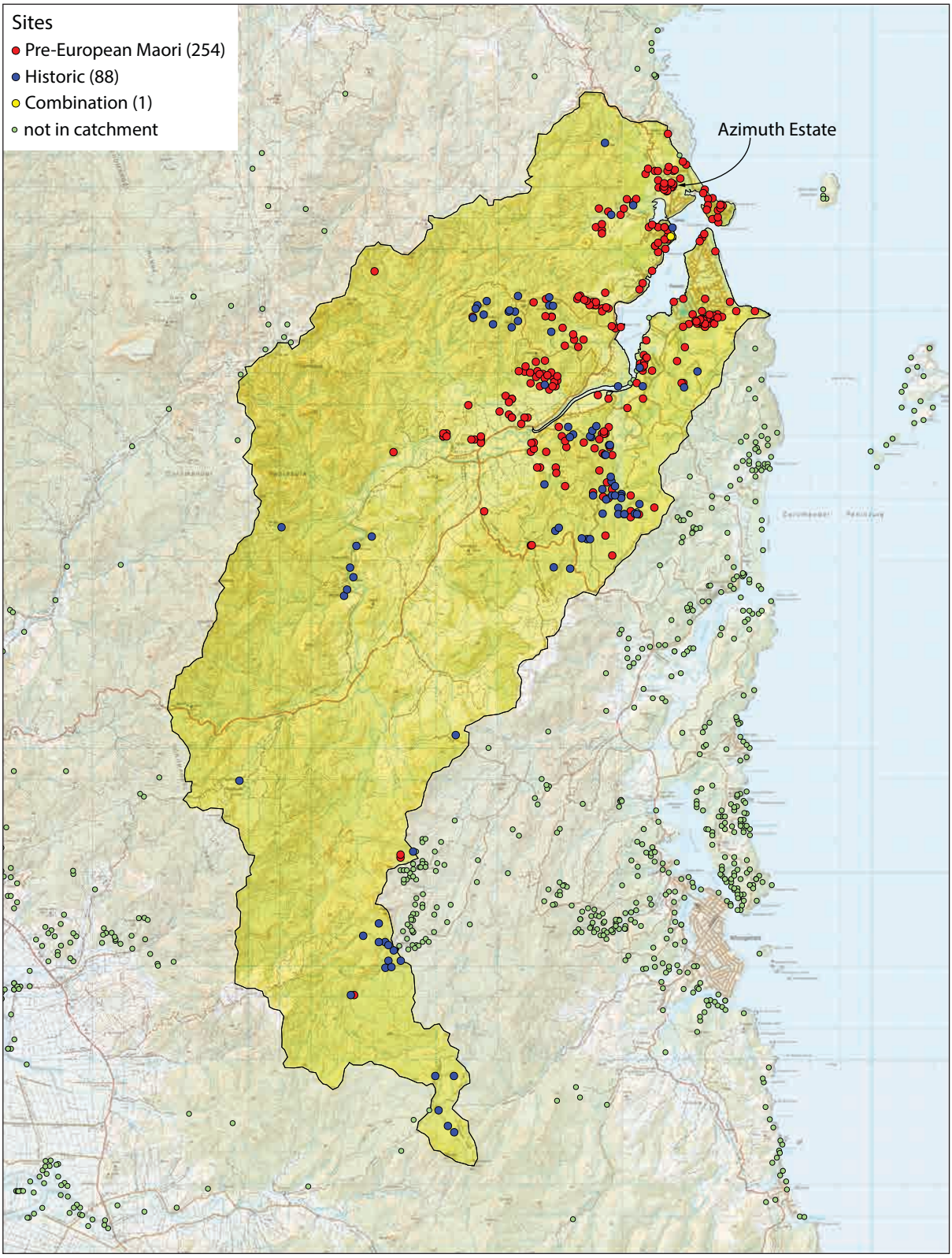

Figure 3. The Tairua Catchment, showing recorded archaeological sites by period.

(Smart and Green 1962; Green 1967), at that time the only known artefact from tropical Polynesia known from New Zealand excavations (a tropical shell chisel has since been identified from Wairau Bar museum collections, Davidson et al. 2011). As one of the first North Island sites for which a faunal analysis was carried out (Rowland 1977: 135) the site has an important place in the history of New Zealand archaeology. For these reasons the site has been well studied although it was not a particularly large or intensive occupation compared to other early sites on the Coromandel or elsewhere. Layer 2 dates to the mid-13th to 14th centuries AD, which is earlier than most accepted dates from the upper North Island (Schmidt and Higham 1998), though the date is statistically indistinguishable from dates more firmly in the late 13th to 14th centuries and, other than the find of a single highly significant item, Tairua does not stand out from other sites of similar age and situation on the Coromandel Peninsula. Apart from the pearl shell lure, one adze and four roughouts of Tahanga basalt, abraders, moa bone fishhooks and tabs as well as needles and an awl were recovered. Bone of four species of moa was recovered. Four sea mammal species, mostly kekeno (fur seal, *Arctocephalus forsteri*), were identified (Smith 1978). Age/sex categories indicate at least nine fur seal individuals were present, while pups indicate a nearby breeding population. Twenty-four small bird taxa from coastal, forest and wetland environments were found, including pelican, though in generally small numbers (data in author's possession). The small fish assemblage was dominated by tāmure (snapper, *Chrysophrys auratus*) with a significant proportion of wrasse (Labridae sp.) and tarakihi (*Nemadactylus macropterus*). Shell was dominated by rocky shore species with a significant component of *Cellana denticulata*[1] in contrast to the dense Layer 6 midden, dated to 16th or 17th centuries AD, dominated by pipi (*Paphies australis*) and tuangi (*Austrovenus stutchburyi*) (Davidson 1964).

Site T11/308 on Paku[2] was investigated by Cathryn Barr in 1994. The midden was primarily pipi with some tuangi. One flake of obsidian was recorded.

Sites T11/823 and T11/824 were investigated by Amanda Young (1996) and Nicholas Twohill (1996) on the north side of Paku. T11/283 consisted of two layers of midden with no internal features and few artefacts. It seemed to have been deposited downslope in a fan shape. It dated to the mid-15th to mid-17th centuries. T11/824 was a less dense midden deposit on a natural terrace. It dated later than T11/823, to the early 16th to early 18th centuries. Both midens were dominated by tuangai and pipi.

T11/974 on Paku was excavated by Brenda Sewell in 2008. The midden was dominated by pipi and tuangi, and no bone or stone was recovered. Charcoal from the midden contained both broadleaf trees such as pūriri (*Vitex lucens*) and pōhutukawa (*Metrosideros excelsa)*, and shrub/scrub species like mānuka (*Leptospermum scoparium)* and *Coprosma* sp., indicating clearance of the local landscape, probably for gardening. The site was dated to the 16th or early 17th centuries AD (Sewell 2008).

Warren Gumbley (2002a, 2002b) investigated two sites in the Tairua Forest in 2001 that were being affected by forest harvest and associated infrastructure. T12/125 was partly damaged by forest operations but 13 firescoops were found, eight of which contained small quantities of shell, dominated by tuangi and pipi, with low numbers of whelk (Buccinidae) and mudsnail (*Amphibola crenata*). T12/1053 was a more complex site, with at least three terraces, on one of which a small pit was excavated. Several patches of midden and patches of blackened soil were found during site trenching. No midden samples were analysed, but were identified in situ as dominated by tuangi and pipi. Charcoal samples were analysed, which

[1] *C. denticulata* requires cold conditions to breed and populations in the upper North Island are considered to be relicts or stragglers and were extirpated soon after people arrived. They are therefore a marker of early sites in the region.

[2] T11/308 is the site record for Paku Pā. Twelve sites are recorded on this prominent hill, all of which are probably part of a single site complex, including other sites discussed here.

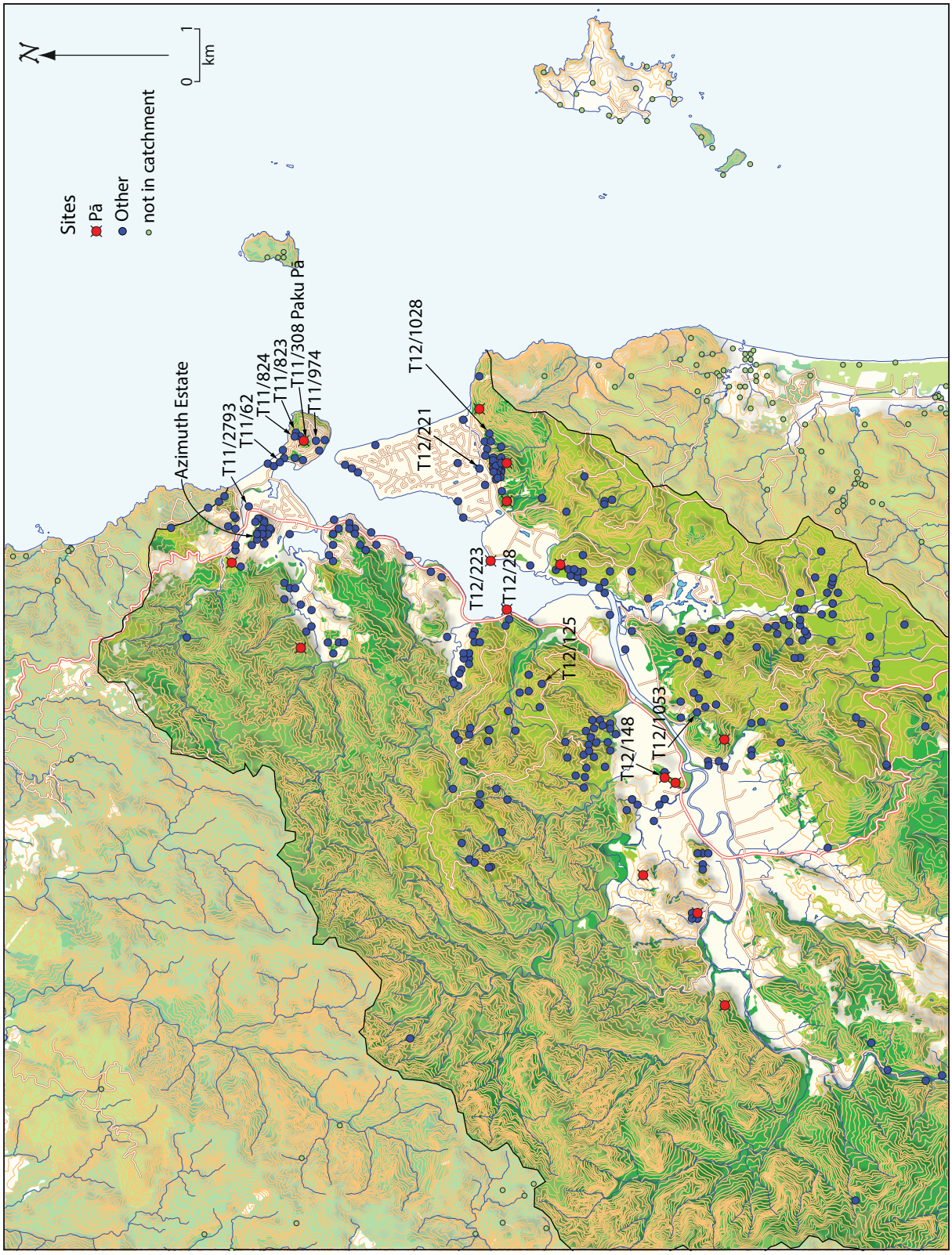

Figure 4. Excavated sites and other sites mentioned in the text.

were typical of secondary regrowth, indicating initial forest clearance and abandonment prior to re-occupation. The site dated to the late 17th or early 18th centuries AD.

T11/2793 was investigated by Andrew Hoffmann in 2015 following damage to the site during Waikato Regional Council floodway improvements. Two middens, charcoal stained soils and possible garden soils were recorded. Midden A contained two layers separated by 150 mm of flood deposits, an upper player of crushed shell 100 mm thick, and a lower layer of pipi and tuangi 200 mm thick (Hoffmann 2015). A final report for this investigation is not yet available.

At Pauanui, Warren Gumbley investigated a kāinga, T12/1028, on the hillside overlooking the Tairua Harbour as part of a subdivision (Gumbley 2003: 1). The excavation recorded post holes on a terrace, midden, and previously unrecorded terraces running over 50 m. The shellfish species indicated people were primarily exploiting the harbour and sometimes the sandy shoreline (Gumbley 2003: 3). Also recorded during analysis were red gurnard (kumu, *Chelidonicthys kumu*), mackerel (hauture, *Trachurus* sp.) and a small unidentified lizard. Dating suggested occupation was within a few decades either side of AD 1600 (Gumbley 2003: 4).

Site T12/221 was investigated by Matthew Campbell and Danielle Trilford in 2018 (Campbell and Trilford 2019). The area investigated was in low lying, formerly swampy ground that was a remnant of an originally larger midden that extended onto higher ground to the east, now destroyed by development of the adjacent golf course. The main occupation would have been on the higher ground and the midden excavated would have been an incidental deposit. Two midden layers were excavated, dated to the mid-16th to mid-17th centuries (Layer 2) and the late 16th to early 18th centuries (Layer 1). In both the main resource being targeted was pipi and tuangi from the nearby harbour, with some shellfish from the open beach, while a small fish assemblage demonstrated that other resources were also being targeted.

Campbell and Trilford point out that Pauanui township is built on a barrier dune complex covering 2.5 x 1.5 km which can be assumed to have originally had numerous similar middens across it although only 10 are recorded. It is probable that the original dune midden landscape would have represented a much more varied set of occupation and subsistence strategies than found from the small excavation of T12/221. A similar sized dune midden landscape at Omaha in northern Auckland, for instance, recorded nearly 300 middens of varying size and complexity (Bickler et al. 2003). The construction of Pauanui has destroyed much of this dunefield landscape although remnants may be preserved.

Previous field survey

The most comprehensive site survey programme around Tairua was carried out by Larynn Diamond in 1978 (Diamond 1979) (Figure 5). Diamond surveyed the lower Tairua Valley, including 297C Main Road, where he recorded six sites. In total he recorded 94 sites, 90 of which were pre-European. The majority, 68, were middens, while he also recorded 7 pā (3 of these, including Paku, had been previously recorded). One hundred and sixty-eight sites are now recorded within Diamond's survey area, though this report does not analyse the reasons for these new records being generated. During the assessment of 297C Main Road Campbell and Cruickshank (2014) relocated three of Diamond's six sites and recorded six more and it is likely that similar assessments of effects triggered by development proposals are responsible for much of this increase. Similarly, while some of Diamond's sites may no longer be visible others are likely to be found during future survey.

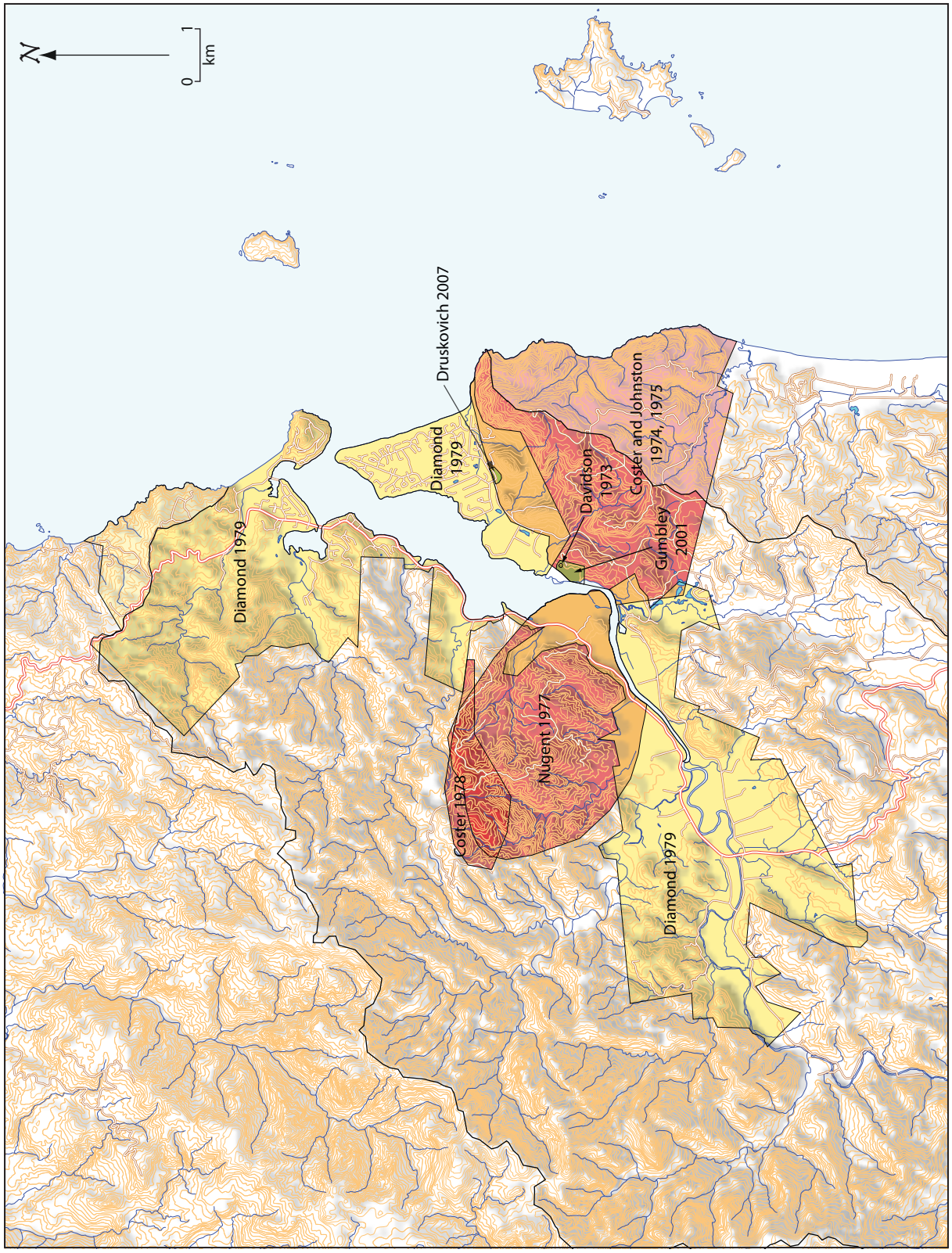

Figure 5. Areas of known aereal archaeological site survey.

In 1974 and 1975 John Coster and Gabrielle Johnston surveyed forest blocks south of Pauanui (and other blocks outside the Tairua catchment). Here they recorded very few sites although there is a significant cluster of sites just north of the survey area.

In 1977 Dennis Nugent carried out a site survey of forest blocks to the north of the Tairua River. He recorded 26 middens; five terraces wit associated midden; two pā, one of which had been badly damaged by machinery during scrub clearance; six mining associated sites; and a carved rock that had been displaced by bulldozing.

In 1978 Coster and Johnston recorded further sites in and to the north of the area surveyed by Nugent. They did not record any new pre-European Māori sites, but did record seven kauri driving dams and two sites that were either gumdigging or logging camps. In addition, they noted 14 mostly logging related sites that were known to Forest Service staff or from historic records, but which they did not visit.

There are also numerous sites in forest blocks that have consecutive site numbers and so were presumably recorded as part of pre-harvest assessments, but reports for these have not been found.

A landscape analysis of Tairua

Site distributions can be analysed with respect to the landforms they are located on as well as their relationship to other sites. There are several limitations in undertaking this sort of analysis for Tairua. Firstly, the analysis undertaken here is restricted to the Tairua catchment but it should be evident that the occupants of Tairua would have interacted with a much wider area, both directly with occupants of neighbouring catchments, with the offshore islands such as Motuhoa / Shoe Island and Whakahau / Slipper Island, with resource procurement areas such as obsidian on Tuhua / Mayor Island, and indirectly with numerous other groups and landscapes throughout the upper North Island. Another limitation is that sites have only been recorded piecemeal and there are several areas where sites might be expected that do not appear to have been visited by an archaeologist, or where more sites than were originally recorded might be expected, similar to Azimuth Estate, or where sites will have been destroyed prior to recording, such as the Pauanui sandspit. Finally, archaeological sites have been recorded since the 1950s and the quality of site information is variable. Sites were initially recorded on 100 yd grid references, which were converted to 100 m grid references as the map data became metricated in the 1980s. Site locations potentially have only a 200 m accuracy. Since the mid-1990s sites recorded by hand-held GPS are generally located to ± 5 m.

Nugent (1977) noted that the middens he recorded were all within 200 m of fresh water and mostly below 100 m elevation, though they could occur at up to 200 m. Diamond (Diamond, 1979: Figure 16) graphed his sites by distance from navigable water and height above sea level, essentially by accessibility (Figure 6). Most sites are located at lower elevations (below 50 m asl), but not necessarily close to navigable waterways (72% were within 300 m), in other words, accessibility by canoe was a factor in site location but not a major one. Unsurprisingly, pā tend to be at higher elevations, between around 70 and 180 m, and at a distance from waterways, between 100 and 400 m, although two are close to navigable waterways at low elevations. These latter two would have used the waterway itself as a defensive feature: T12/28 is located on a headland that has been cut off by a ditch and bank, while T12/223 is located on a high point on the coast with a cliff on one side and swampy ground all around.

Fourteen pā have been recorded in the Tairua catchment. Some of these are probably better described as pit / terrace sites as, though located on hilltops, they lack defensive features. Three have never been visited by an archaeologist, having been recorded from aerial photos or viewed from the road. Most recorded pā are small sites, with between one and ten

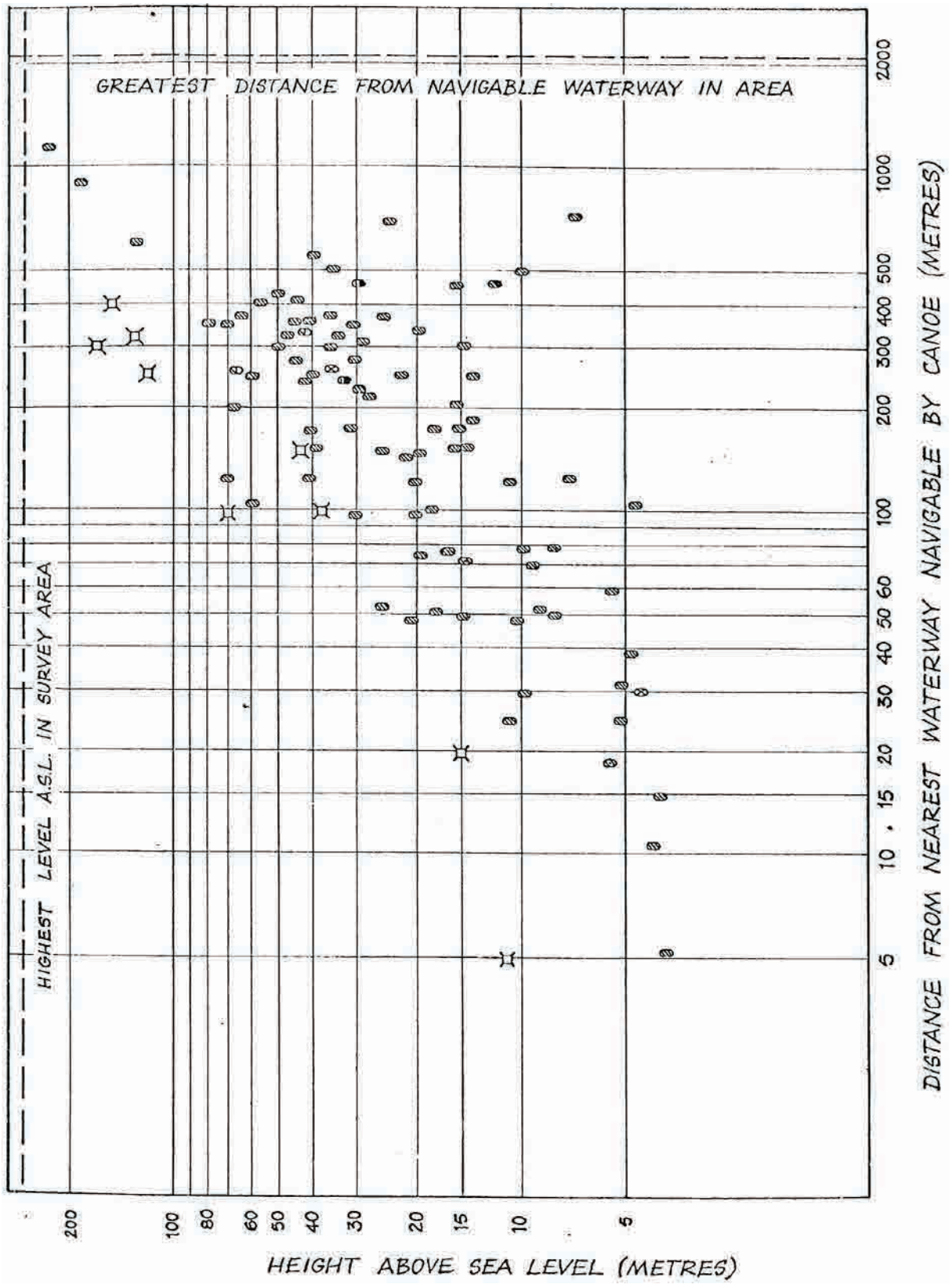

Figure 6. Diamond 1979: Figure 16, showing sites graphed by distance to navigable water and height above sea level. Both scales are log_{10}.

terraces and occasional pits. T11/308, Paku Pā, has been partly covered by houses and roads but presumably was a large and significant site. T12/148 is the only other pā that could be described as a large site. Overall, Tairua was not a heavily defended landscape, with only two large, central pā, Paku and T12/148, which may not necessarily have been occupied at the same time.

The lowest layer of the Tairua site, T11/62, dates to the earliest period of the Polynesian occupation of New Zealand. It is probably not an extensive site, though its full extent beneath the dune and Paku Drive is not known, and probably functioned as something like a seasonal winter camp. The later layer at the site dated to the 16th–17th centuries, and other excavated sites around Tairua generally date to the 15th–17th centuries, while sites further inland date as late as the 18th century. Settlement at Tairua began in a sheltered coastal spot, in this case the inland side of a sand tombolo, and by the 15th century began to move inland to other harbour side locations and the low hills flanking the harbour. Later dates have been obtained further inland again, in areas of poorly drained, not particularly fertile soils (Figure 7 shows "very broken, poor soil") that are today most suited to pine forestry and were probably not overly attractive to pre-European Māori settlement. Early historic period plans show that the bush line at the time of European settlement was still close to the harbour (Figure 2) and even at the end of the 19th century large areas of "heavy kauri", "light bush" and "old kauri workings" are still evident (Figure 7). The majority of pre-European Māori sites in the Tairua catchment are small middens and pit / terrace sites, close to the coast or centred on relatively good gardening soils, where slope and aspect may have also been factors, and settlement never extended far into the surrounding hills. Sites in general would not have been the focus of year-round occupation, populations were probably never high, and settlement would have been mobile.

Figure 7. Detail of SO 11007, Plan of Tairua & Puketui Blks, *dated 1897.*

It is notable that 19th century European sites, associated largely with extractive industries such as timber milling and mining, are generally located inland of pre-European Māori sites (Figure 3).

Methodology

The bulk of the archaeological investigation was undertaken over a 12 month period between September 2016 and October 2017, as Lots were topsoil stripped for contouring and house platform construction. Lots where archaeological material had been identified during the site survey (Campbell and Cruickshank, 2014) were archaeologically monitored. Some retaining works were monitored in May and November 2020.

In the eastern portion of the development, cut and fill activities were minimal, mainly associated with the construction of Azimuth Road, the main access road along the ridge, and two smaller roads, Mason Rise to the east and Bill Brewster Lane, a right of way to the west. In the eastern portion, Lots 7, 8, 10, 11 and 12 had archaeological sites associated with them, so each had a 25 m diameter area stripped for the construction of a house platform and associated curtilage. The balance of each Lot has been left unmodified (Figure 8).

The works within the western portion of the development required intensive modification to create usable house platforms. The areas where cut activities were required near relocated and previously recorded sites were monitored by an archaeologist.

Results

In total, more than 12,500 m^2 of topsoil stripping was archaeologically monitored, with 35 pre-European Māori archaeological features recorded across seven sites, including 13 postholes, 14 storage pits including 3 bin pits, a drain and 7 middens. Some previously recorded sites were not relocated, while some proved to be redeposited midden for which no sampling or analysis were undertaken.

T11/271 and T11/281

These two sites are located on the central spur on the eastern side of the main driveway. This driveway was realigned in 1980 (Figure 9), cutting out a large section including where T11/281 had been recorded. The realignment has caused some difficulty in determining the location of these sites and their relationship to each other. The site record form for T11/271 described the site as being on the "crest of a broad spur immediately west of the driveway" with T11/281 recorded in the cutting for the driveway in roughly the same vicinity.

The area was revisited in 2014, when the previous driveway and a large continuous midden were identified. The midden was 50 m long and approximately 10 m wide, with its northern extent visible in the cutting for the original driveway, terminating to the south in the bank of the current driveway, where the spur had been significantly altered for the new alignment.

The midden matches the descriptions for T11/271 and T11/281, and it is likely that the full extent of the site was not visible in 1978 and probably only became evident due to the extensive modification of the ridge for the driveway realignment, and subsequent erosion. These two sites can be considered as one larger site, referred to here as T11/281.

Earthworks were undertaken in the vicinity of T11/281 to reshape the batter for the main access way and to form a driveway and house platform for Lot 1. Topsoil stripping showed that most of the midden identified during the assessment stage was redeposited, with

Figure 8. Map of Lots referred to in text, showing house platforms and recorded archaeological sites (the background photography is pre-development).

one in situ deposit identified (Feature 34). This had been truncated, presumedly when the original driveway had been created. The remnant portion measured 4.5 x 2.6 m and was surrounded by a charcoal stained soil. A 10 litre bulk sample was retained for analysis.

T11/273

Lots 25 and 26 required significant earthworks to flatten the ridgeline out for the construction of house platforms and driveways. The cut was up to 3 m, and topsoil stripping of the two Lots was archaeologically monitored. A single bin pit, Feature 35, was identified in Lot 26 measuring 1650 x 700 mm x 400 mm deep (Figure 12). It contained a loosely packed shell midden 25–45 mm thick and a 10 litre bulk sample was taken. The south east corner of the pit had been disturbed by rabbit burrowing.

Figure 9. Detail of aerial photograph SN5702/F1/3, taken in 1980, of showing the old driveway and the recently constructed driveway.

Figure 10. View west of the remnants of Feature 34, T11/271.

Figure 11. View southwest of Pepe Inlet from T11/281.

To the south, west and east the ground had been heavily affected by root disturbance, which could have obscured any subtle features such as postholes. Based on the aids to relocation in the original site record for T11/273, it appears that the site extends on to the neighbouring property to the south.

T11/282

The house platform for Lot 23 was stripped in October 2016, exposing a midden measuring 7.1 x 5.2 m x 200 mm deep. No other features were identified in the house platform or subsequent stripping of the surrounding area. There are plough lines in the vicinity that have most likely destroyed other features such as firescoops, which would be expected to be found in association with a midden (Figure 13 and Figure 14).

T11/283

This site was initially identified as two separate middens (Campbell and Cruickshank 2014), with the northernmost sparse middens on Lots 10 and 11 assigned to T11/283, and the lens exposed in the slip on Lot 10 was given a new site record, T11/1054. However, during monitoring it was noted that the deposit is essentially continuous and T11/1054 can be considered a duplicate number.

In September 2016 Lots 10 and 11 had 25 m diameter areas cleared for house platforms. In November 2020 a retaining wall was built to stabilise the slip below the Lot 10 house platform. No archaeological material was observed during topsoil stripping for the Lot 11 house site, although probing indicates it extends close to the platform.

Figure 12. Feature 35, T11/273, half sectioned. A small remnant of the shell midden lens is still visible in the left hand portion of the profile. Scale = 0.5 m.

Figure 13. Drone photo of Feature 33, T11/282, in Lot 23, showing plough lines.

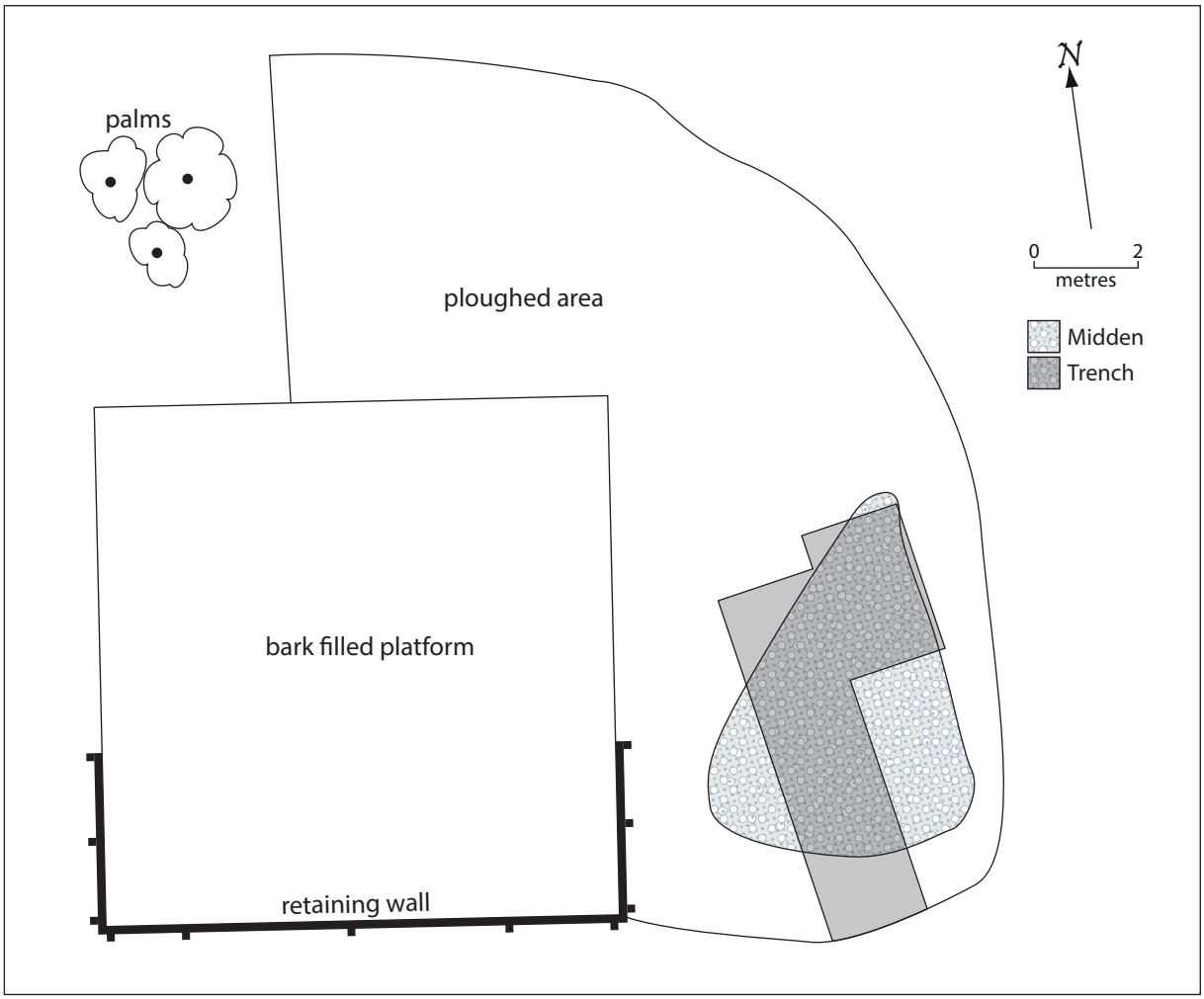

Figure 14. Plan of Feature 33, T11/282, in Lot 23.

During topsoil stripping for the Lot 10 house platform (Figure 15 and Figure 16), a midden, 12 storage pits and an associated drain were exposed and cleaned down by hand. The site had been truncated by previous earthworks, possibly associated with construction of the house that was still present during excavation. The site has also been damaged by slips on the face of the bluff overlooking SH 20.

Three middens associated with T11/283 were monitored, excavated and sampled in Lot 10: Feature 31 in the house platform (Figure 17); Feature 3 (recorded as T11/1054 in 2014) in the slip to the east of the house platform; and Feature 37 exposed by the access track cut to install the retaining wall.

A total of 34 m^2 of Feature 31 was exposed in two patches at the north end of the house platform. It was up to 80 mm deep, and included charcoal and fire cracked rock, but no fire-coops were observed. The midden had quite probably been truncated by farming activities.

Feature 3 was exposed as two lenses in the face of the slip up to 300 mm deep (Figure 18). Probing showed that it extended up to 3 m west from the face of the slip. Only a small amount of Feature 37 was exposed when cutting an access track, and the full extent of the deposit was not determined, though probing suggested it was no larger than 3 x 2.5 m.

Twelve storage pits (including Pit 24, a small pit classified as a bin) were generally aligned in an east to north east direction, essentially following the shape of the ridge, with

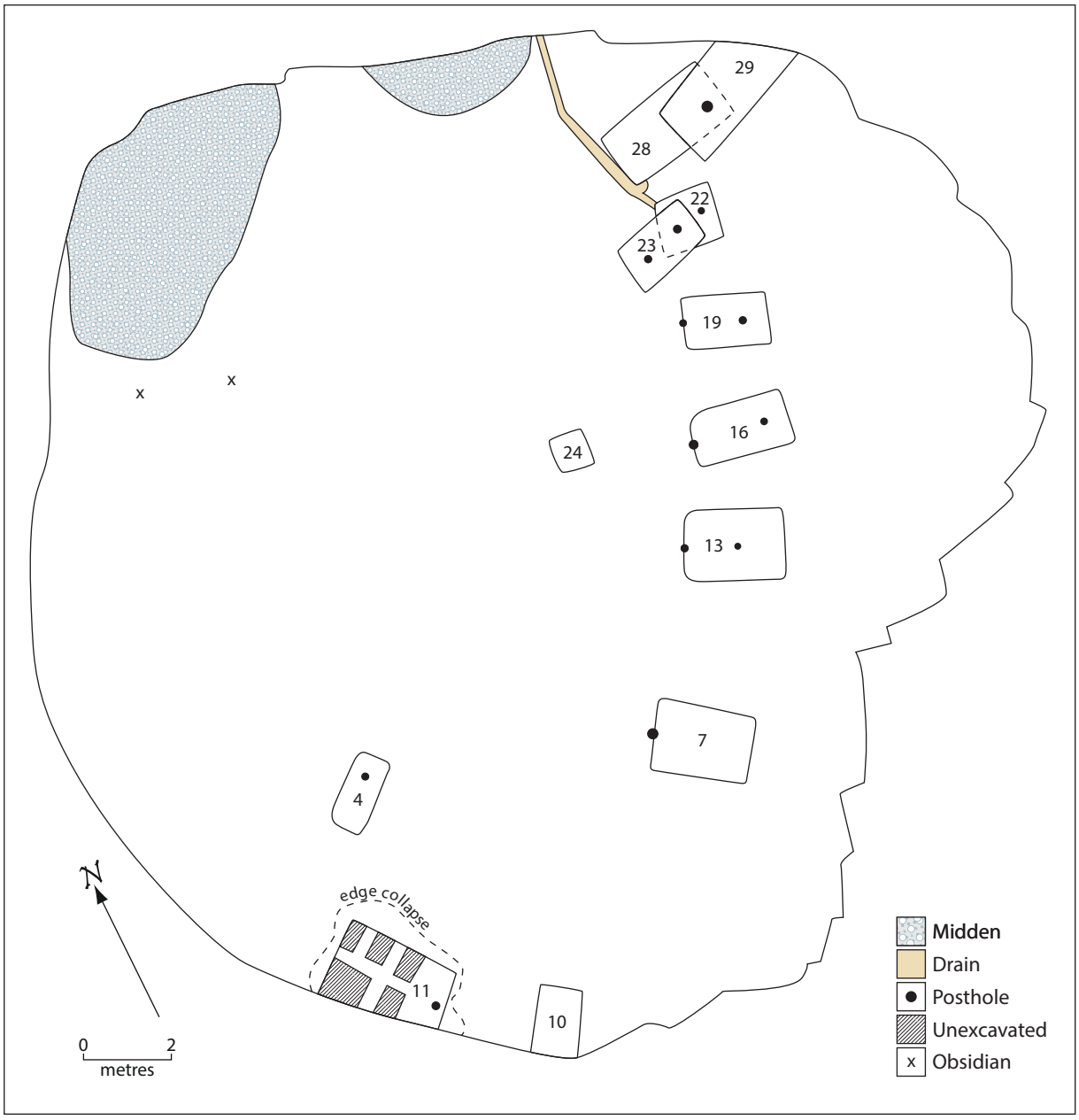

Figure 15. Plan of excavation of T11/283, in Lot 10.

the pits being dug along the slope. They were generally small, ranging between 1400 x 1200 mm and 2300 x 1700 mm in plan (Pits 11 and 29 ran into the baulk and may both have been larger). Most pits were shallow, between 110 and 360 mm deep, although Pits 28 and 29 were 470 and 590 mm deep respectively. They have all been truncated by previous earthworks levelling the area, with the deeper pits surviving better as they are downslope to the north east of the house platform. The fill was generally clean, somewhat darker than the subsoil, containing occasional fire-cracked rocks and flecks of charcoal. Most pits had one or two postholes in the base to support the roof structure, often one in an end wall and one further down the centre line of the pit. Feature 30 was a drain that ran from the north west corner of Pit 22, across the end of Pit 28 (indicating they belonged to the same phase) and down the slope to the north. A large cobble was placed in the drain, possibly to stop rats entering the pit. In two cases pits

Figure 16. Drone photo of excavation of T11/283, the Lot 10 house platform.

Figure 17. Feature 31, T11/283, exposed during topsoil stripping.

Figure 18. Feature 3, T11/283, exposed in the face of the slip.

Figure 19. Features 28 and 29, T11/283, excavated, with drain Feature 30 in background.

Figure 20. Feature 30, T11/283, drain, running north from the corner of Feature 22.

intercut each other indicating two phases of occupation: the relationship between Pits 22 and 23 was unclear, but Pit 29 clearly cut Pit 28, indicating that Pits 23 and 29 were the two later pits, as Pits 22 and 28 shared the drain. 10 litre samples were taken from the main midden, Feature 31, and the middens exposed in section

T11/1053

This midden was initially recorded during the 2014 survey, exposed in a slip to the east of the Lot 7 and lot 8 house platforms. The site has almost completely been destroyed by the slip, with two deposits remaining: Feature 1, 3 x 0.5 m x 250 mm deep; and Feature 2, 7.5 x 0.4 m x 250 mm deep. The quantity of redeposited shell down the slope indicates the midden would have been substantial (Figure 21 and Figure 22).

T11/1055

Lot 12 house platform was monitored due to its proximity to T11/1055 and T11/283. Two features were identified, including a midden (Feature 6) measuring 6 x 4 m x 200 mm deep and a single bin pit (Feature 5) (Figure 23 to Figure 25). A 10 litre bulk sample was taken for analysis.

T11/1056

This site was initially recorded in 2014 in disturbed ground at the head of a north-east trending gully in Lot 17. It is a small (23 m^2) scatter of pipi and tuangi, in poor condition

Figure 21. Feature 1, T11/1053, showing in situ lens and material eroding into slip. Photo Scale = 1.0 m.

Figure 22. Feature 2, T11/1053. Photo Scale = 1.0 m.

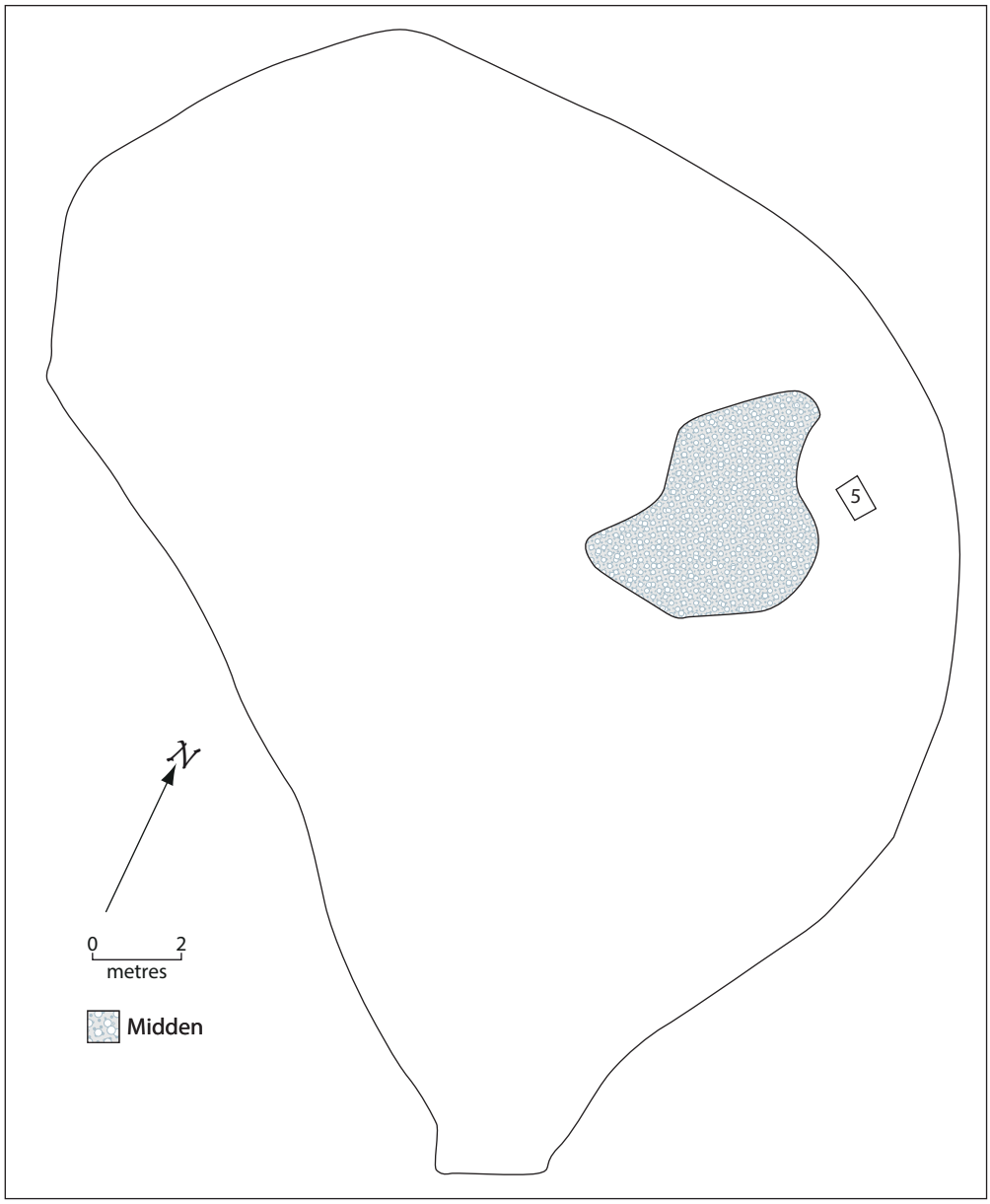

Figure 23. Plan of excavation of T11/1055.

due to ground disturbance from pine planting and harvest. The site was inspected when the high point that straddled Lots 16, 17 and 18 was cut down but no undisturbed contexts were observed and it was not sampled.

T11/1057

This site was recorded in 2014 as a small scatter of fragmented pipi and tuangi on the surface of a walking track in Lot 14, approximately 130 m west of the existing house. It was probed and was detectable over an area of 16 m^2. The site was recorded as being in poor condition, having most likely been heavily disturbed by pine planting and harvest. A road was cut through the side of Lot 14 and it was clear that the midden had been redeposited, with clear

Figure 24. Drone photo of house platform for Lot 12 and midden T11/1055 during excavation.

Figure 25. View east of cross section of Feature 6, T11/1055. Photo Scale = 1.0 m.

digger bucket marks present beneath the midden. It is not known where the shell originated, and it was not sampled.

T11/1052

This site is a small sparse midden exposed in machine slump on the hillside approximately 60 m south west of the existing house, first recorded during the 2014 assessment. Fragmented pipi and tuangi were noted in the deposit. It was occasionally detectable through probing over approximately 5 x 5 m and was assessed as being in poor to fair condition. During earthworks it was noted that the shell was mixed with clay and appeared to be entirely redeposited, probably from road construction, and it was not sampled.

T11/2850

During works in November 2020 to install a retaining wall on the eastern slopes of Lot 10, a midden (Feature 36) was exposed in profile when an access track was cut. The midden was visible in the cut beneath 0.5 to 1 m of topsoil / overburden. It was 7 m long x 600 mm deep. A 10 litre bulk sample was taken for analysis and radiocarbon dating.

Sites not relocated

T11/272 was described in 1978 as being on the eastern flank of a broad spur north of the golf course, and west of the existing house. This deposit was tentatively relocated in 2014 by probing the general area it was originally recorded in. There was an area approximately 3

Figure 26. T11/2850 exposed in the access track cut.

x 3 m which indicated a sub-surface deposit of unknown condition. However, during topsoil stripping no midden was observed and the material detected by probing may have been gravel.

T11/277 was described in 1978 as being located on the western flank of a spur trending north from the main ridge dividing Pepe and Grahams Valleys. The site was not relocated during the assessment phase or during works.

Analysis

Ten 10 litre bulk samples from six sites were selected for analysis. Analysis was undertaken by Jennifer Graydon and Hayley Glover of CFG Heritage. The samples were returned to the lab where they were dried, weighed, wet sieved through a 3 mm screen, re-dried and re-weighed. The samples were sorted to class by hand (shell, stone and charcoal) and each class was passed to the relevant specialists for further analysis. No bone was recovered from the samples and very little stone.

Shell

Diagnostic material (shell, stone and charcoal) accounted for between 22 and 60% of the samples by weight (Figure 27), with the remaining matrix lost to wet sieving. Most of the middens, therefore, were reasonably dense deposits in undisturbed contexts, with shell accounting for 40–60% of the sample by weight. The exceptions are Feature 33, which was disturbed by ploughing, and Feature 37, which was recorded when an access track was cut, which probably disturbed the deposit – in each case disturbance would have mixed soil into the deposit, which washes out with the matrix leaving behind a smaller proportion of shell.

While Feature 33 may have been turned over and mixed by ploughing, 50% of the shell by weight could still be identified to species (Figure 28). Conversely, over 50% of Feature 31 was shell by weight, indicating it had not been mixed into the surrounding soil, but only 20% of this could be identified to species level. This deposit had probably been crushed and the archaeology showed that it had been truncated by heavy machinery. There was still a reasonably high MNI in this sample (Table 1) but many of these would have been small hinge fragments of pipi.

Taxonomic identifications were based on Morley (2004). Table 1 shows that the samples were dominated by soft shore bivalves, pipi (*Paphies australis*) and to a lesser extent tuangi (*Austrovenus stutchburyi*), with other soft shore and rocky shore species only present in low numbers. The exception is Feature 37 which has more tuangi than pipi. The majority of shellfish were taken at mid to low tide from the nearest marine environment, the Tairua Harbour which is 300–550 m from the sites. The only sandy shore species present in some samples was tuatua (*Paphies subtriangulata)*, which would have likely been collected at the nearby sandy shore, 750–1100 m distant. There were very few rocky shore species, which would have had to come further – the rocky coastline of the harbour and Paku is more than 1500 m distant.

Lithics

There were 23 flaked stone artefacts and a proximal end of an adze recovered from the investigation, comprised of three types of stone; obsidian (n=13), chert (n=8) and basalt (n=2). Of the 23 flaked stone artefacts, 22 had a maximum dimension greater than 10 mm and were analysed, while the remaining flake was classified as shatter. Analysis was based on methods outlined in Beyin (2010), Holdaway and Stern (2004), Turner (2005), Phillipps and Holdaway (2016) and Cruickshank (2011).

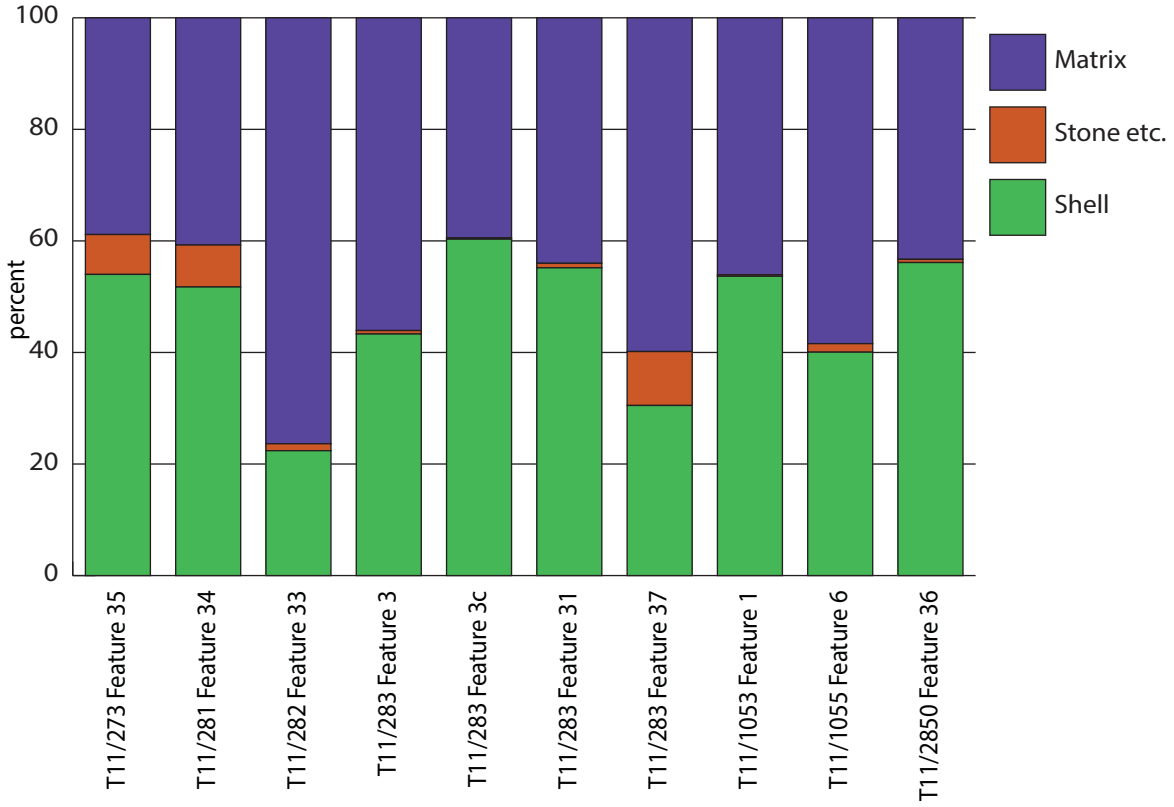

Figure 27. Proportions by weight of material retained or lost through sieving for each analysed sample.

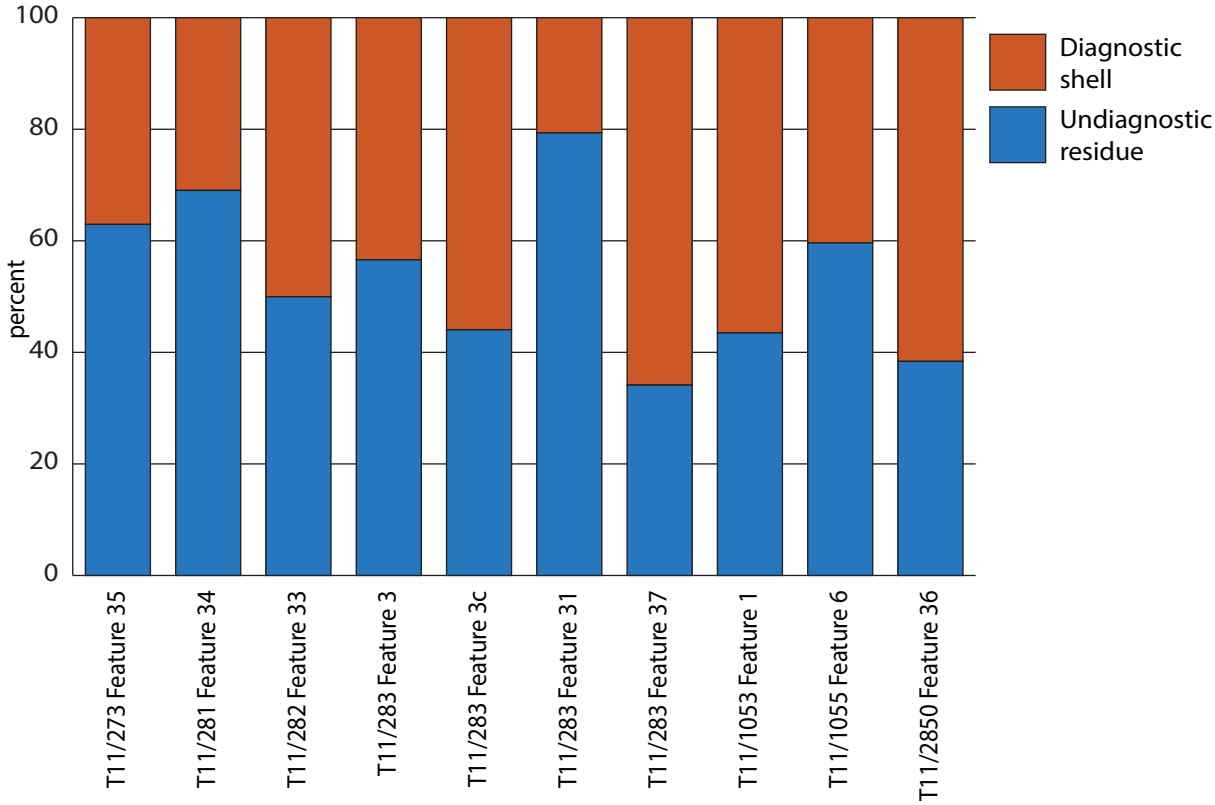

Figure 28. Proportions by weight of diagnostic shell, identified to taxon, and undiagnostic fragments for each analysed sample.

Table 1. MNI values for the shell assemblages. 'Non-economic' species are separated out by size.

Taxon	T11/273 Feature 35	T11/281 Feature 34	T11/282 Feature 33	T11/283 Feature 3	T11/283 Feature 3c	T11/283 Feature 31	T11/283 Feature 37	T11/1053 Feature 1	T11/1055 Feature 6	T11/2850 Feature 36
Bivalves										
Pipi (*Paphies australis*)	515	374	218	299	484	304	163	306	421	1315
Rock oyster (*Saccostrea glomerata*)						5				
Tuangi (*Austrovenus stutchburyi*)	34	43	7	183	473	73	291	161	79	169
Tuatua (*Paphies subtriangulata*)	18	2				2		19		15
Mussel (Mytilidae)					1		1			
Gastropods										
Cat's eye (*Lunella smaragda*)	2					2	4			3
Mudsnail (*Amphibola crenata*)	1		7		1		2			
Silver paua (*Haliotis australis*)								1		
Topshell (*Diloma* sp.)				5				1		
Whelk (*Cominella* sp.)		6		1						
Non economic species										
Slipper shell (*Maoricrypta monoxyla*)		1				7	1	1		
Chiton (Polyplacophora)								1		
Limpet (*Cellana* sp.)								1		
Misc. gastropods					1		4		5	2
Total	570	426	232	488	960	393	466	491	505	1504

All the obsidian identified from this site was green in both reflected and transmitted light. There was no cortex, inclusions or spherulites observed in the assemblage. These flakes most likely originated from Tūhua, which aligns with similar assemblages in the area (Hoffmann 2011; Gumbley and Laumea 2019), where all green flakes have been identified as originating from there. Tūhua is by far the most exploited and dominant of the green obsidian sources in Aotearoa and the closest to the site, approximately 45 km southeast of Tairua.

Of the eight chert artefacts, seven appear to be from a similar source, most likely the same cobble. This was a poor-quality material with some of the pieces displaying a water rolled cortex. The remaining flake was an angular fragment of a higher quality material with a terrestrial cortex. There are multiple sources of chert in the Coromandel of differing qualities, and it is not possible to determine provenance of these artefacts.

A broken adze was found by digger driver Nathaniel Blomfeld prior to the investigation approximately where Lots 8 and 9 are located. It is made of basalt, most likely from the Tahanga quarry and displays usewear. It has a maximum length of 88 mm, a maximum width of 77 mm, maximum thickness of 42 mm, and a bevel angle of 28°. The front and the back are polished, while flake scaring from reduction during the manufacture process is evident on the sides. It has suffered a transvers fracture on the poll just above the bevel, but its dimensions indicate it was originally a much larger tool. These dimensions coupled with a rectangular cross section suggest a large Duff (1977) Type 2b or 2c adze. The obvious transverse fracture aside, the cutting edge has suffered large chipping which would have rendered the blade unusable and would have taken considerable effort to repair. It was most likely intentionally discarded as the length to thickness ratio post breakage would have made reworking this piece difficult.

There were two flakes of Tahanga basalt retrieved from the site, both displaying cortex. These flakes are likely the result of adze manufacture on site from blanks obtained at the quarry approximately 30 km north of Tairua (Turner and Bonica 1994). These flakes suggest that primary adze manufacture (as opposed to reworking) was an activity undertaken at this site.

Charcoal

Charcoal analysis was carried out by Rod Wallace of the Anthropology Department, University of Auckland. Charcoal was extracted from the middens samples during sorting and nine charcoal samples were submitted for identification and radiocarbon dating sample extraction. The results are summarized in Table 3.

At the time the middens were deposited, the local environment included both kauri dominated forest and mānuka dominated secondary regenerating vegetation, both of which were presumably close enough to the sites to provide firewood, and implying that the assemblages were deposited during the process of land clearance, or that land clearance had not proceeded far.

Table 2. Charcoal identification results.

Taxon	plant type	number	%	sample presence	%
Shrub sp.	Small shrubs	4	64%	2	49%
Tutu		1		1	
Hebe		2		2	
Coprosma		3		2	
Fivefinger		6		4	
Mānuka		48		7	
Kānuka		1		1	
Māhoe	Broadleaf trees	1	17%	1	28%
Rewarewa		1		1	
Maire		5		2	
Tarairi/Mangeao		1		1	
Pūriri		6		4	
Pōhutukawa		3		2	
Mataī	Conifers	2	20%	1	21%
Tānekaha		2		2	
Kauri		16		5	

Chronology

Seven shell samples, all pipi, were submitted to the University of Waikato Radiocarbon Dating Laboratory from five sites (Table 3) (charcoal samples were also available for dating but were not used, see Appendix A). The results are consistent and generally cluster around the mid-15th to late 16th centuries AD with some possibly dating into the 18th century.

Table 3. Radiocarbon results.

Lab number	Site	Feature	CRA BP	cal AD 68.2%	cal AD 95.4%
Wk-47011	T11/273	Feature 25	736 ± 28	1512–1630	1471–1667
Wk-47012	T11/281	Feature 34	806 ± 28	1449–1545	1430–1643
Wk-47013	T11/282	Feature 33	775 ± 28	1469–1583	1450–1648
Wk-52465	T11/283	Feature 3c	736 ± 26	1513–1665	1455–1763
Wk-47105	T11/283	Feature 31	804 ± 28	1450–1546	1430–1635
Wk-47104	T11/1055	Feature 6	767 ± 27	1476–1590	1455–1650
Wk-52464	T11/2850	Feature 36	752 ± 32	1505–1655	1442–1747

Discussion and conclusion

Seven sites were investigated during works at the Azimuth Estate, all middens. T11/283 also contained several small kūmara storage pits and a bin pit was found at T11/1055. Radiocarbon dates suggest a range dates of occupation from the mid-15th to the mid-18th century.

Shellfish identified were primarily estuarine species that could have been taken from the Tairua Harbour, which is the nearest body of water, with a few sandy and rocky shore species taken from more distant environments such as Paku or Tairua Beach. The assemblages were all generally similar, with no identifiable fishbone.

The early layer at T11/62, the Tairua site, was dominated by rocky shore species, with significant quantities of bone as well as artefacts (Smart and Green 1962). In contrast, later sites, contemporaneous with the Azimuth Estate sites, such as T11/974, T11/308, T11/823 and T11/824 on Paku (Sewell 2008; Barr 1994; Young 1996; Twohill 1996), and the upper layer of The Tairua site (Davidson 1964), T12/221 at Pauanui (Campbell and Trilford) or T12/1053 in the Tairua Forest (Gumbley 2002b), all contain midden essentially similar to the Azimuth Estate middens, dominated by pipi and tuangi with little fishbone, despite being closer to rocky or open shore environments.

Charcoal analysis showed significant assemblages of both kauri, indicating primary forest, and m*ā*nuka, indicating secondary growth. Early historic plans of Tairua show that the area was never extensively cleared of kauri (Figure 2 and Figure 7) and primary forest suitable for firewood collection would have been relatively close to the site.

During this period of occupation, the local environment and the resources taken from it did not change a great deal, and the Azimuth Estate site results are consistent with other late occupations in Tairua. Soils are generally poor and evidence of horticulture is sparse, for instance the pits at T11/283 are all small, and few other pit sites have been recorded. Pā are few in number and generally small, with the exceptions of Paku and T12/148. Most occupation evidence reported from Tairua indicates small scale, probably seasonal encampments, with people visiting the area briefly to harvest shellfish, combined with small-scale gardening. Although the east Coromandel Coast was a focus of early Polynesian settlement, a source of important stone resources and is well studied archeologically, there are no major early settlement sites and occupation may always have been generally small in scale. The Azimuth Estate sites fit this pattern.

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Appendix A: Features excavated

Feature	Lot	Site	Type	Length	Width	Depth	Notes
1	8	T11/1053	Midden	2100	700		
2	7	T11/1053	Midden	7000	200		
3	10	T11/283	Midden	8000	4500	300	
4	10	T11/283	Pit	1800	830	110	
5	12	T11/1055	Bin Pit	1150	700	420	
6	12	T11/1055	Midden	6000	4000	200	
7	10	T11/283	Pit	2200	1700	340	
8	10	T11/283	Posthole	100	120	520	In Feature 7
9	10	T11/283	Posthole	100	130	230	In Feature 4
10	10	T11/283	Pit	1420	1120	340	
11	10	T11/283	Pit	2800	1200	470	
12	10	T11/283	Posthole	120	120	400	In Feature 11
13	10	T11/283	Pit	2300	1700	280	
14	10	T11/283	Posthole	160	200	510	In Feature 13
15	10	T11/283	Posthole	160	170	140	In Feature 13
16	10	T11/283	Pit	2170	1400	340	
17	10	T11/283	Posthole	140	140	410	In Feature 16
18	10	T11/283	Posthole	110	110	140	In Feature 16
19	10	T11/283	Pit	2560	1300	120	
20	10	T11/283	Posthole	130	120	350	In Feature 19
21	10	T11/283	Posthole	130	130	240	In Feature 19
22	10	T11/283	Pit	1650	1440	320	Cuts Feature 23
23	10	T11/283	Pit	1400	1200	360	Cut by Feature 22
24	10	T11/283	Bin Pit	750	770	200	
25	10	T11/283	Posthole	130	70	160	
26	10	T11/283	Posthole	210	210	130	
27	10	T11/283	Posthole	140	160	160	In Feature 29
28	10	T11/283	Pit	1800	1350	150	Cut by Features 29 and 30
29	10	T11/283	Pit	1700	1500	590	
30	10	T11/283	Drain	3800	200	400	Cuts Features 22 and 28
31	10	T11/283	Midden	7500	4000	80	
32	10	T11/283	Posthole	120	120	100	In Feature 23
33	23	T11/282	Midden	7100	5200	200	
34	1	T11/281	Midden	4000	3000	150	
35	26	T11/273	Bin Pit	1650	700	400	
36	8	T11/2850	Midden		7000	600	
37	10	T11/283	Midden	300	250	200	

Appendix B: Charcoal analysis

Sample 1 – T11/283, Midden

Shrub sp.	3
Hebe	1
Coprosma	1

Sample 2 – T11/283, Midden

Shrub sp.	1
Coprosma	2
Fivefinger	2
Manuka	8

Sample 3 – T11/283, Midden

Fivefinger	1
Manuka	1
Mahoe	1
Puriri	1
Maire	1
Tanekaha	1
Kauri	2

Sample 4 – T11/1055, Midden

Manuka	2
Mangaeo/Tarairi	1
Puriri	1
Beech	1
Kauri	1

Sample 5 – T11/283, Pit

Hebe	1
Manuka	7
Kanuka	1
Puriri	3
Kauri	2

Sample 21 – T11/283, Pit

Manuka	9
Kauri	10

Sample 22 – T11/282, Midden

Manuka	5
Fivefinger	2
Pohutukawa	1

Sample 23 – T11/281, Midden

Tutu	1
Rewarewa	1
Puriri	1
Maire	4
Pohutukawa	3
Tanekaha	1
Matai	2

Sample 24 – T11/273, Pit

Manuka	15
Fivefinger	1
Kauri	1