

Figure 10. Pa at Ruatoki, W16/167.

of Plenty region. This is a plausible date for this region, as can be seen from the individual site reviews. It shows that the emergence of a perceived need for security in the region occurred as early there as anywhere else in New Zealand.

9.2.3 Terraces

Terrace sites are common in the Bay of Plenty and may or may not be associated with pits or midden. As noted in the section under pits in the field records, terrace sites are more likely to have midden associated with them than are pit sites, which is consistent with terraces having a primarily domestic (housing) function. On excavation, terraces often turn out to be part of wider site complexes. In the Kawerau area, the Tarawera lapilli has filled most pits, so that the sites appear now as if they were simple terrace sites only.

O'Keefe (1991) has extracted the number of terraces per site from the recorded sites in the western Bay of Plenty. Single terraces occur most frequently, and the frequency of sites with larger numbers of terraces decreases regularly up to sites with about nine terraces. Thereafter, sites with larger numbers of terraces are more frequent than would be expected. This indicates that sites with ten or more terraces comprise a different population, perhaps the result of construction under different social circumstances than the smaller sites.

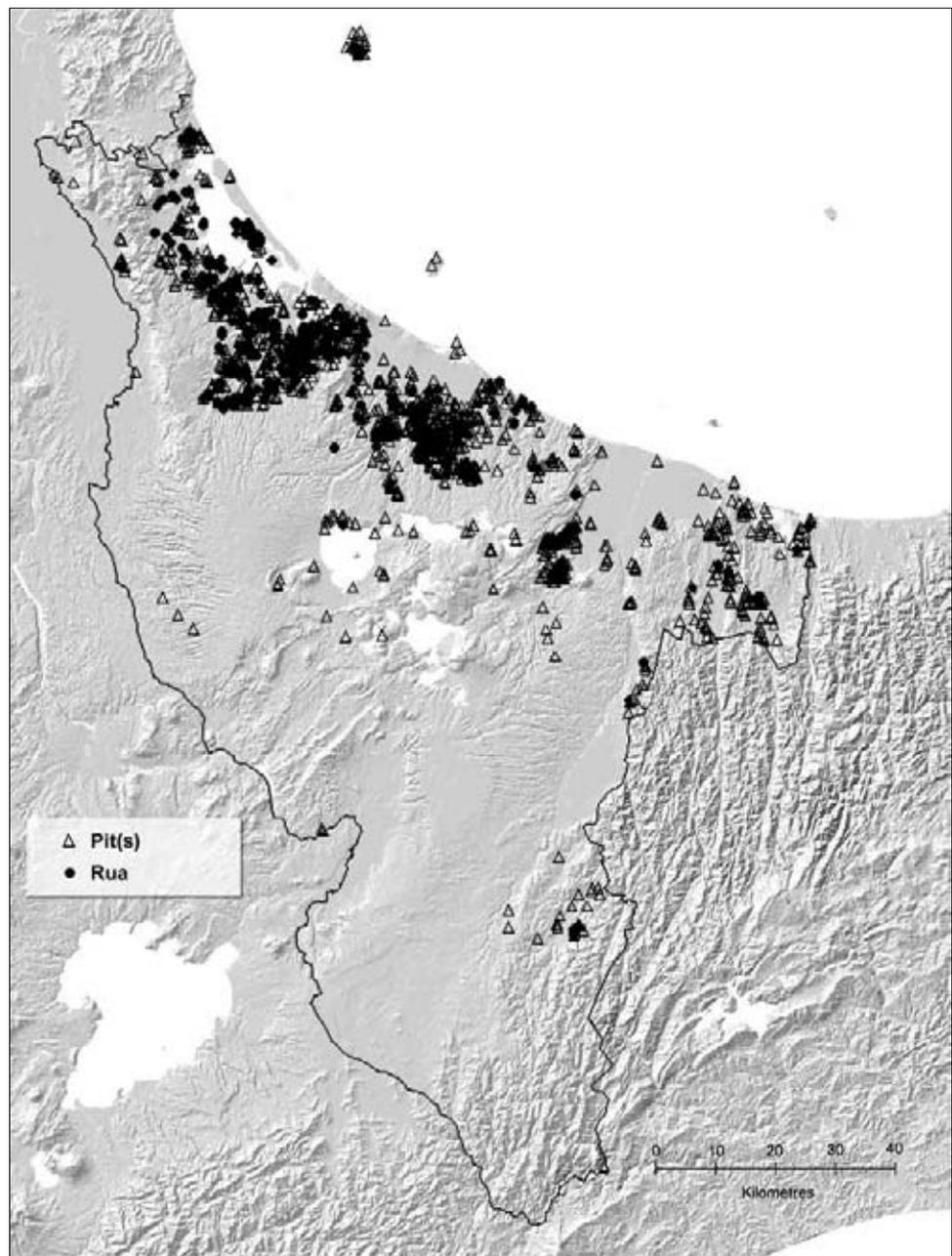
Undefended occupation sites are represented in the excavation record, most notably the Maruka research project at Kawerau (Lawlor 1981; Walton 1981; Furey 1983). Elsewhere in New Zealand, records indicate that some undefended sites have had long occupancies, and have yielded reasonably numerous artefacts. Such long-term sites have not, as yet, been identified amongst sites excavated in the Bay of Plenty (but see Jones (1984b) and Campbell (2004) for details of site excavations of other undefended sites).

9.2.4 Storage pits

Storage pits are either open rectangular holes on flat surfaces, or cave-like pits that archaeologists call rua (see Glossary). Sites with pits or rua are commonly coastal features, but are generally located behind swampy foreshore areas. Rua take a number of forms: caves cut in from natural escarpments; symmetrical bell shapes with top entries; and asymmetrical shapes with top entries. Some excavated examples are cut from the walls of entry pits on level ground. The distribution map from the site records shows rua to have a more westerly distribution (Fig. 11). However, both rectangular pits and rua are present throughout the area. The archaeological evidence shows that both have some antiquity. Both occur within fortifications and separate from them.

Bell-shaped rua were used for kumara storage as late as the 1940s on Motiti Island (Matheson 1979: 102). Hence they cannot be assumed to be pre-European

Figure 11. Distribution of pit and rua sites in the Bay of Plenty region.



just on their appearance. Matheson (1979) recorded them as being used with sand spread on the floor and kumara stacked against the walls, with a central clear floor space for access and the capacity to hold up to a tonne of tubers. Burials have also been recorded in rua (Coster 1977). These must have taken place under duress or be of low-status people, as the food association would normally have made such burials abhorrent, at least to modern Maori.

Rectangular pits with small hearths, grooved excavated walls, buttresses and differing patterns of floor post holes have been found. Lawlor (1983a) reviewed the various pits found at Kawerau in an important series of excavations. Some rectangular pits in the Kawerau area are very large—as much as 10 × 8 m in plan. Law (1999) identified a pattern of unusually long pits from the northern North Island. These included five sites from the Bay of Plenty: Ongare Pt Pa, Kauri Pt undefended site, Judea U14/2240 (McFadgen 1985b), and Kawerau sites V16/238 (Furey 1983) and V16/202. A further Bay of Plenty record obtained more recently is U14/2037 at Welcome Bay (Hooker 2000c). This is an infilled pit in an undefended site. It does not add anything further to the dating information. The very long pits seem to date from the 16th century. They are usually infilled and are on sites with other occupation evidence. They are not known as open surface features. The structures may have been used to display the wealth of the owners on the basis of the large amount of stored food.

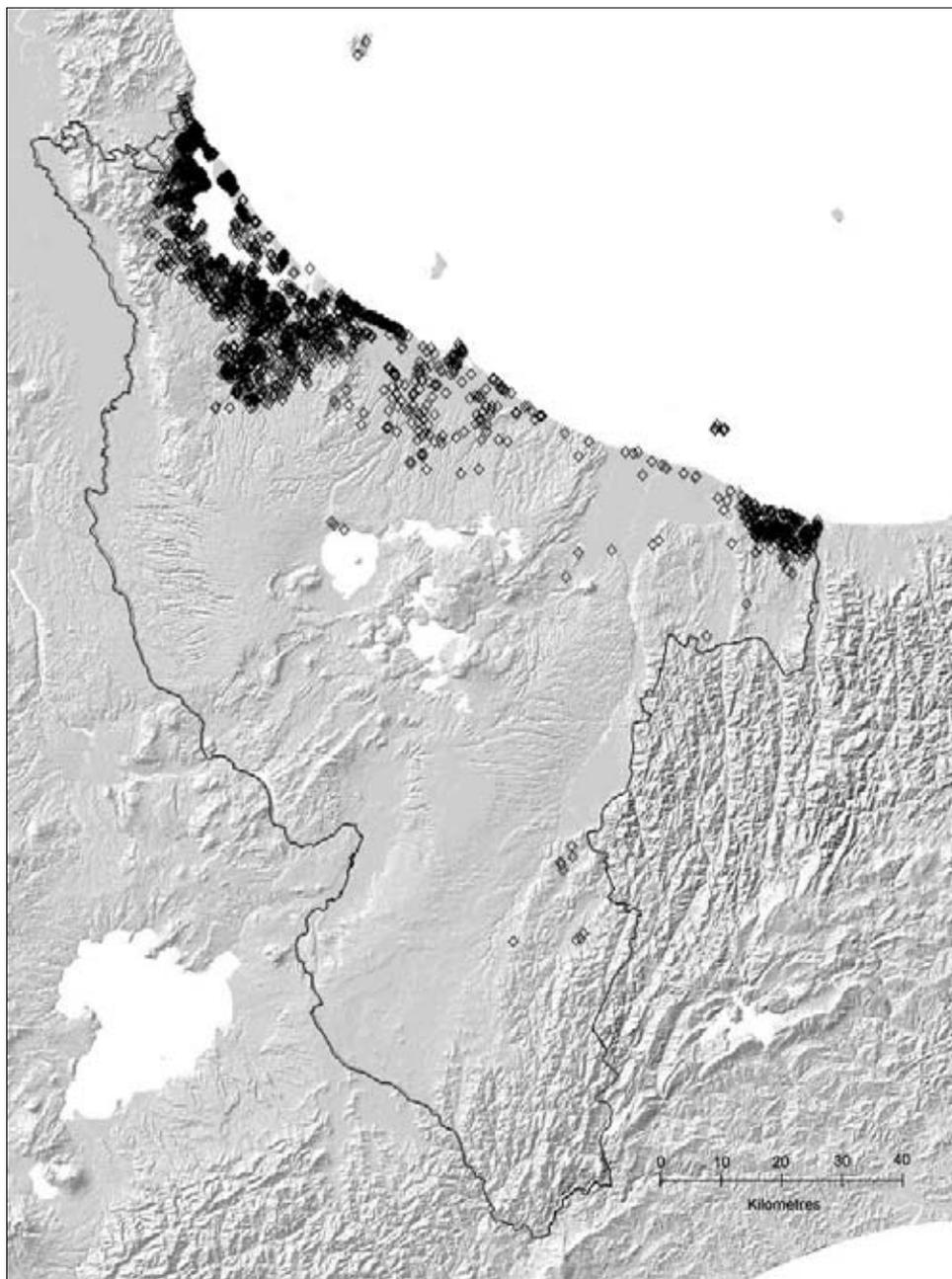
O’Keeffe (1991) has extracted data on sites with pits from the western Bay of Plenty. The number of sites with pits showing on the surface declines regularly up to sites with about five pits. Thereafter, the frequency declines more slowly but regularly up to sites with about 11 pits; there are a few sites with many more pits than this. Hence, there seem to be three patterns of pit sites: sites with one or a few pits, sites with 5–11 pits, and sites with larger numbers of pits. This may reflect the size of the social units responsible for the construction of the sites. Over the same area, the association of middens, as seen by the field recorders, is also interesting. Middens are far more commonly associated with terrace sites than pit sites. This suggests that many of the pit sites were not occupation sites or, if shellfish consumption was seasonal, it was not in the season when the pit sites were commonly used.

9.2.5 Middens

Figure 12 illustrates the distribution of recorded middens in the Bay of Plenty region. While their distribution is predominantly coastal, they extend well inland in places, particularly south of Tauranga and Maketu. There is a notable decline in their frequency from Pukehina to Te Teko, reflecting the absence of estuaries in that area and the steep, high-wave-energy beaches where shellfish are less common. The Tauranga area in particular has a very high frequency of middens. Disturbance of the ground in this area at any modest scale by cultivation or for earthworks often exposes middens. Such exposures are often indicative of other buried archaeological evidence, such as storage pits.

Appendix 4 summarises the animal species (other than shellfish) recorded from middens. Some of these records are from midden-only sites, but others are from more general sites that include middens. The paucity of bird and mammal identifications is startling. The fish identified cover the range of species that would be expected from the locations, demonstrating that

Figure 12. Distribution of middens in the Bay of Plenty region.



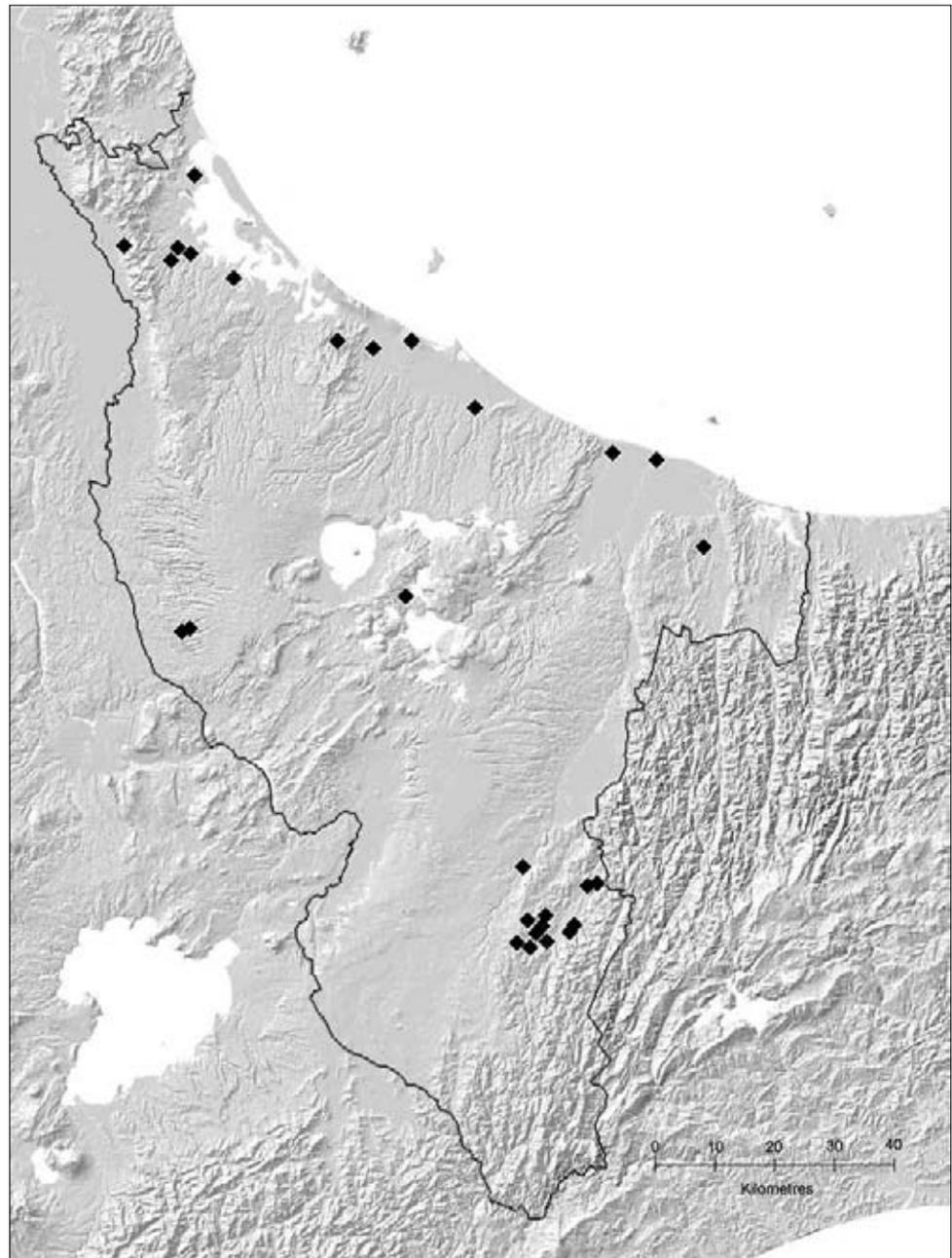
a variety of marine fish habitats must have been utilised and a variety of techniques used to catch fish, although there is little archaeological evidence of fishing gear. There are some gaps in species representation, however. Eels have not been identified in the midden contents, even though the alkaline environments created by shell middens aid the preservation of any included fish bone. However, shell middens become scarce inland in the areas where middens are most likely to have incorporated the very fine bones of eels. Hence, eel bones in these sites are likely to be unidentifiable or non-recoverable because they have been destroyed by acidic soil conditions.

Kakahi (freshwater mussel) middens occur around the Rotorua Lakes, and may provide better conditions for the preservation of freshwater fish remains. One analysis of a kakahi midden has been reported for U15/9 at Rotorua. The only fish bone found was believed to be blue mackerel (*Scomber australasicus*)—a marine species (Campbell 2005: 106).

9.2.6 Wooden artefact find spots

Figure 13 shows the distribution of wooden artefact sites or find spots across the Bay of Plenty region. The number is not large for such an important site type or find. The concentrations shown inland from Murupara are the bird-snaring troughs mentioned previously (section 8.1.1) and the pa sites recorded with intact palisade posts. Other sites are generally close to other concentrations of evidence along the coast. There are likely to be more sites on the lowland margins on the western side of the Kaimai Range and wood remains in existing or former swamps. The practice of submerging canoes in lakes during times of stress (Smith 1953: 25) must leave some hope that they remain as an archaeological resource.

Figure 13. Distribution of sites yielding wooden artefacts (mostly wetland sites) in the Bay of Plenty region.



9.2.7 Religious sites

Tuahu (shrines) have been recorded in the area but not studied. Best (1924: 83) illustrated one that had four standing stones 'in the Rotorua district'. Simmons (1986: 32, Plate XX) illustrated a further site photographed early in the 20th century with stone paving and three upright stones. The location is not given, but there is an implication that it is Arawa. A further shrine is noted at Okataina (U16/20; Anon. n.d.a). Tuahu are frequently referred to in the early traditional histories of the region.

9.2.8 Rock and tree art sites

The site of longest record is the famous Kaingaroa shelter (V17/3), a few kilometres west of Murupara, which has a large number of canoe carvings as well as zigzag and ladder figures. The canoes have conventional Maori prow and stern pieces and are decorated with spirals. The site has been investigated and reported many times (Hamilton 1925; Davis 1958; Spiers 1971) and has been the subject of some inventive interpretation, such as suggestions that the carvings depict the Great Fleet (Wilson 1962). Early excavations in the shelter floor produced little archaeological material.

Ambrose (1961) recorded rock carvings in two groups at Ongare Point, including the front elevations of houses and canoes, some in relief and others incised. Some words in Roman letters led Ambrose to believe that the carvings related to the mid-19th century. Images of two canoes from this site were used as cover illustrations on the New Zealand Archaeological Association Newsletter volume 9, 1966.

A stone found at a pa site near Aongatete (T14/26) is recorded as having figures and canoes carved on it.

Stafford recorded rock paintings at Nga Rape O Tuahu at Rotoehu (Stafford 1996: 99, and illustration facing p. 97; 1999: 115), but noted there was some dispute a century ago about how recent they were. The figures illustrated appear to include red spirals.

Gregg (1956) recorded a rock drawing site at Tarawera (U16/11) that had been buried under sediment when the lake was dammed following the Tarawera eruption. The site had been excavated after the lake levels dropped. Ladder and canoe figures, mainly in red, were observed. Further painted or drawn rock art (a canoe in red ochre) is known from Okataina (U16/68) but has not been reported in detail.

The Rua Hoata shelter on the Waikato River (U17/3) had carvings on the wall and roof of canoes and one reptilian figure (Phillips 1947). Some 54 canoe glyphs of a variety of forms occurred, some in relief in profile, others canoe-shaped recesses in the rock surface. One was believed to depict an outrigger canoe, while another with a double prow was thought to be a double canoe. Another had a spiral design as decoration. One large canoe had writing on it, which Phillips believed was Maori in origin, but was possibly added later. The shelter had been explored at an earlier date, and kokowai, net fragments, a kit (kete), a flute, string, shells used as scrapers, fire sticks and fire ploughs were found. Phillips found remains of four more kete and a raupo sleeping

mat. Sadly, this shelter has recently collapsed, the victim of varying water levels in the river resulting from flow control for hydroelectric generation.

Site V14/179 on Motiti Island is recorded as having petroglyphs of spirals and grooves. At Moturiki Island (U14/448), a spiral carved on a rock has been recorded (Law 1969), and at the same site a hollow has been ground into the top of a rock (U14/364).

Although not strictly rock art sites, there are stones or stone surfaces where adzes have been ground, leaving wear grooves. One, from Matata, is now a prominent display item in Auckland Museum (Fulton 1921). Others are known from Rotorua, on an island just off Motutara Point (U16/110), east of Rotorua (U16/52), and on the shores of Lake Okataina.

Some remarkable rock art sites have recently been reported near Tokoroa by Fletcher (2002). He discovered a number of small shelters in ignimbrite cliffs, many with ochre markings. Most of the sites have a single ochre daub on the wall. Three sites have figures, which Fletcher suggested are a leaping figure (U6/128), a bird in flight (U16/126) and a *manaia* (a stylised figure) (T16/79). This site also has a further figure that he did not try to interpret. The first two sites and a further site without figures also have many daub marks. Fletcher compared the ochre markings to other sites he has surveyed on the west side of the Waikato, outside the boundaries of the Bay of Plenty region.

Fletcher (2002) recorded two further shelters in the area with carvings. One (T16/96) has a canoe carving in relief with the conventional prow and stern pieces and 'KOTAINUI' ('This is the Tainui') carved along its length. There are also ochre markings at this shelter. The second shelter (U16/114) has incised figures that Fletcher interpreted as stylised birds. Other surface finds in this series of shelters were a waka huia lid in an undecorated shelter, two obsidian flakes, a chert flake, a Duff type 2B adze, a bird bone toggle, a wooden comb top and a stone pounder. This assemblage would certainly argue for pre-contact occupation, and the ochre markings are likely to be contemporary with that. However, the canoe carving with the lettering must relate to the period after the advent of Maori literacy. Its discovery makes it more likely that the canoe with writing at Rua Hoata had the lettering inscribed at the same time as the canoe was carved, suggesting a later age for at least some of the carvings there. Ambrose's conclusion that the Ongare sites' glyphs were all late in age (19th century) is also strengthened.

A similar site or sites has been illustrated by Tapsell (2006: 90) in the headwaters of the Pongakawa Stream, with red figures including a canoe on a shelter wall and an incised word 'Toa' in Roman upper and lowercase letters, also on a shelter wall. Stafford also illustrated this site or sites (Stafford 2007: 59 and coloured plate between 64 and 65). This is a remarkable series of sites that show that the body of known rock art from the Bay of Plenty area is not a closed book and can be expected to expand.

The Rotorua area also has a number of sites with rock figures in deep relief carved into a face or carved in the round (on all sides of the medium, to form a three-dimensional object). One is from a cave at Te Tihi o Tonga south of Rotorua (Simmons 1986: 27, Plate XIIa; Stafford 1999: 94). It is identified as a representation of Horoirangi, an Arawa ancestress. It was located by a stone-cut stairway leading to a storehouse cut into a cliff. The well-known double-sided figure on Mokoia Island (Simmons 1986: 30; U15/51) has the two sides named as Matutonga—the god of growth—and Matuatehe—the god of decay. Mokoia was a renowned kumara-growing area, so the first is certainly appropriate.

Two repeated themes occur in rock art from the area—canoe petroglyphs and the drawing of red figures. The association of figures carved in the round with ancestors and gods is consistent with carvings in houses.

A sole dendroglyph (carving on a tree) has been recorded near Te Whaiti (V17/1).

9.2.9 Unusual artefacts

An interesting group of artefacts are the so-called ‘bowling stones’ from the Tauranga area (Semadeni 1912). These are like small cheeses, rather dissimilar from the Tahitian discus-like bowls, which are thinner and have a perimeter notch. None of the stones are known from archaeological contexts. One precise find spot has been recorded (U14/429). They are not known from outside the Bay of Plenty. Gardner (1993) recorded the locations of some further examples, all of which seem to have been close to Tauranga—Otumoetai (2), Rangiwaea, and sand dunes at Mt Maunganui. Despite their physical differences from the Tahitian examples, it is hard to think of a better explanation for them than that they are bowling stones.

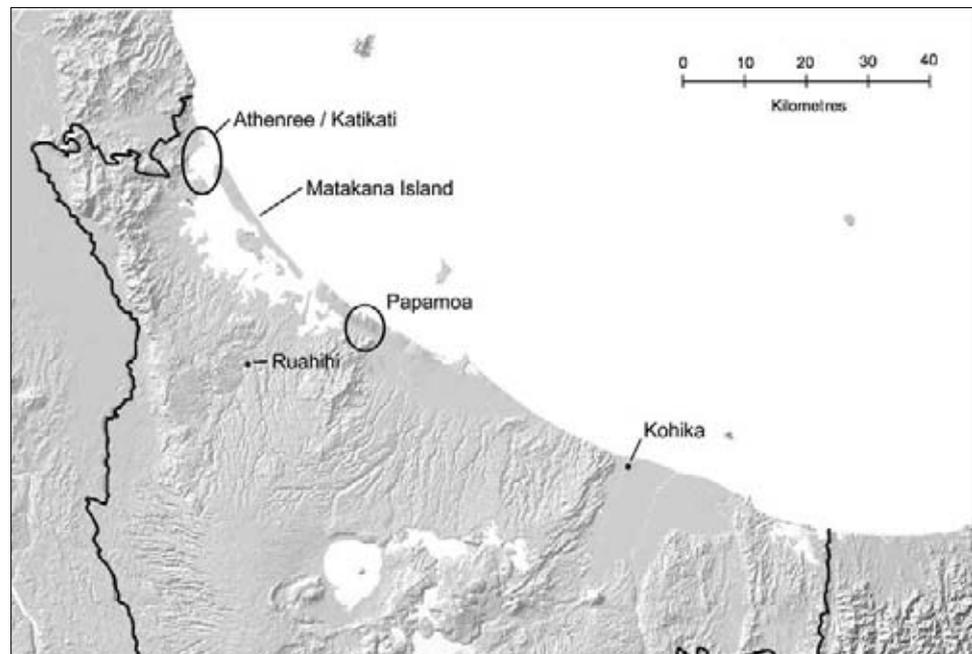
9.2.10 Boundary markers

Several sites in the eastern part of the region are recorded as ditches or ditch and bank fences. Downslope ditches are also associated with several pa in the same area. These are most likely to be boundary markers. On Mokoia, standing stones have been recorded from the part of the island previously used for gardens (U15/52); these may also be markers. Matheson (1979: 29) recorded a boundary ditch being dug across Motiti during land dispute in the late 19th century, perhaps continuing an earlier method of marking boundaries.

10. Specific areas

The preceding sections have dealt with general aspects of site distribution and settlement over the wider Bay of Plenty region. This section considers some specific areas in more detail to give an indication of the contribution that archaeology can make in gaining an understanding of particular areas at the scale of a single landscape and also to give a context to particular factors, such as the choice of technology and the use of local environments. The study areas (Fig. 14) have been chosen to represent a wide range of environments in which useful archaeology has been carried out.

Figure 14. Location of specific areas discussed in the text.



10.1 ATHENREE/KATIKATI

This area, which is adjacent to the northern part of Tauranga Harbour, has low Pleistocene marine terraces capped with tephra-derived soils. The main resources are derived from these soils, the Kaimai Ranges hinterland, the harbour and the ocean. The earliest settlement pattern comprised pa that utilised coastal cliff sites, and many undefended sites that seem no more than shell *midden* scatters located well away from the pa and the coast on the rolling inland hills. Fieldwork undertaken in the course of disturbance that was related to development has demonstrated that the middens are associated with infilled storage pits and garden soils (McFadgen 1982).

In the 1960s, a nationally important excavation of the Kauri Point Swamp was undertaken, in a small valley immediately adjacent to the pa of the same name (properly Owarau pa) (both site U13/4). The excavation revealed a small site with an estimated 13 000 obsidian flakes and up to 200 wooden combs, all broken (Shawcross 1977). There was a square of horizontal timbers, some of

which were reused house posts with tenon-jointed ends, and some related upright stakes. Floors of silt and organic material, some of which was wood chips, were present in and around this structure. The distribution of the combs and flakes centred on the structure but also extended beyond it. As well as flakes and combs, there were many other items, including figures, ko (digging sticks), weeding tools, wooden bowls, adze handles, wooden spear tips, broken musical instruments and fibre. However, the number of combs was quite disproportionate to the numbers of other organic items.

There was a considerable depth of material at the site and it is apparent that it had been used for the same disposal purpose for some period of time. Red ochre was common in the site, as were gourd fragments. The top of the site had dried and oxidised at some time in the past, with destruction of the uppermost wooden material (but not the obsidian). Consequently, the last use of the site was probably not represented in the organic material found.

The combs were small flat panels of wood with long carved teeth at the bottom (which would secure the comb to hair tied or bundled at the rear of the head) and exquisitely detailed figurative carvings at the top. They revealed use of manaia bird-like figures as decorative elements through the whole time depth of the site. The heads of the combs varied in form from rounded, through geometric to more realistic depictions of human heads. Shawcross (1977: 289) convincingly argued that all are derived from the depiction of a head incised or carved in a highly stylised form. There was a shift in style through the period of use. In the earliest deposits, a square-topped form was universal, with a gradual transition to a round-topped form, comparable to examples collected in the late 18th and early 19th centuries.

The obsidian flakes were derived from a simple industry, with no sophistication of stone working apparent. Some were found in 'wallets' of woven fibre. One group of 60 flakes was found in a gourd along with a small hammer stone. Other flakes were found in clusters, as if they had been discarded as a group within a now-vanished container.

Shawcross (1977) reviewed the ethnographic evidence and convincingly argued that the site was the disposal place of *tapu* (sacred) material that had been associated with the head (a *tapu* part of the body to Maori), combs, obsidian for hair cutting or possibly ritual scarification, ochre used in decoration of the hair or head, and wind musical instruments played from the lips (Shawcross 1977: 297-300). It would have been logical for the site to have also been used for disposal of cut hair, but no evidence of this survives. The combs may have been deliberately broken when their owners died or started to use a new comb. Whatever the reason for the damage, they were certainly rendered unusable. Shawcross argued that the material was thrown into the site so people could avoid personal contact with the material already there. Shawcross (1977) considered the site was used over several centuries, but Green (1978) argued for a shorter period of time.

Shawcross (1977) argued that this site was a *wahi tapu* (sacred place) based on ethnographic analogies. He was less convincing about it being a particular variety of *wahi tapu*—a *wai tapu* (sacred water place)—as water does not seem to have been essential to its function. The fact that it became a swamp may have been incidental to other Maori use of the small valley in which it lies.

This is an extraordinary site. Phillips et al. (2002) made the case that there is at least one other site where permanent internment of wooden objects was intended, but this is outside the Bay of Plenty region and is not a comb depository. Other wooden artefacts found in wetland sites were more commonly placed in these sites for temporary burial and intended recovery (see Phillips et al. 2002). The demonstration of stylistic change in a stratigraphic sequence is most unusual in New Zealand. The time range for use of manaia styles was an important discovery and a major contribution to the understanding of the history of Maori carving styles.

It must be asked why other similar sites have not been found. This may be because they have not been looked for, but such sites may not normally have been in swamps. If they were on dry land, only the ochre and the obsidian would have survived to the present day, and the site would now present as a place with a high density of these minerals. If such sites exist, they are at present absent from the archaeological record.

The site graphically displays the paucity of evidence that archaeologists deal with when they excavate normal (i.e. non-swamp) sites. The material from the adjacent cliff-edge pa is miniscule in its assemblage size and diversity in comparison. The excavation of the pa site was also a pioneer piece of excavation in New Zealand, with several seasons of work by Golson (1961a, b, c) and Ambrose (1962, 1967). The site presents today as a ring ditch pa and excavation has demonstrated that this was its form in much of the past as well, though a greater area had been enclosed at one intermediate phase. The exterior bank and ditch had been rebuilt in the course of the occupation.

The interior of the pa site was a mass of intercutting pits. The earliest evidence on the site was of pits capped by a garden soil that pre-dated the first fortification. The pits varied in size from 6 m long down to small 'bin' pits. Ambrose (1967) made the case, now generally accepted, that they were constructed for kumara storage, and had short lives before being infilled because of the risk of tuber-rotting fungus spores accumulating in them. He also suggested that fires were lit in the empty structures to fumigate them between uses.

Use of the site for gardening was followed by construction of terraces that were used for cooking and for storage pits. A shell midden is associated with this use. The first ditch defences enclosed the majority of the site and were contemporary with a late stage of the deposition of this midden. A double ditch was used on areas of lower relief, and a single ditch where it was steeper. The inner side of the earthwork defences was palisaded. The ditch was later filled with midden and then the site was re-fortified on a smaller perimeter with a recut single ditch. The last stage of defence following this was construction of a double ditch around the smaller perimeter site, with a palisade along the inner bank and in the base of the outer ditch. The outer ditch was V-bottomed, and the inner was flat-bottomed. Ambrose (1967), in noting the density of pits in the area where there was evidence of three phases of defence structures, concluded that the main purpose of the pa was defence of what was being stored in the pits. Ambrose also raised the expectation that the details of pits might be the 'pottery of New Zealand'—that is, they

would have distinctive forms in their post holes, drains and buttresses that varied spatially and temporally, and these particular features may be able to be used for sorting ages of New Zealand sites. This expectation has generally not been realised, as pits vary considerably within sites, meaning that large samples are needed to make comparisons. The effort required to empty large numbers of pits has defeated some field workers. It is now common practice to record plan size at the surface, or excavate cross sections rather than large parts of pits. No comprehensive history of styles has emerged.

Green (1978), in interpreting the dates from the swamp, the pa and the stratigraphic inter-linkages, argued for a 15th-century date for the first agricultural use of the site. By the end of the 15th century, the settlement of the headland resulted in the stream becoming ponded at its outlet and the swamp beginning to form, followed by the commencement of use of the swamp site. Green considered that the use of the swamp site and the first stage of occupation of the pa occurred in AD 1650–1700. The smaller defended pa was occupied later than this, but this occupancy did not extend into the 19th century, based on the absence of European-sourced materials amongst the excavated articles. This sequence, though very plausible, is based largely on dates from unidentified charcoal. Such dates are known to have potential inbuilt age errors and would not be considered for dating in modern archaeological practice. Therefore, the possibility of the occupation sequence being compressed into a more recent period must be considered.

The Kauri Point undefended site (U13/45) excavated by Green (1963b, 1964) contained a small area of midden and a number of pits of considerable variety in form. It was dated by a sample of unidentified charcoal to the late 14th to early 16th century, but inbuilt age exaggeration is possible. In any event, it is likely to overlap in time with the nearby Kauri Point site, indicating that different occupation styles occurred simultaneously in this area.

Two other Kauri Point sites have carbon dates recorded in the C14 database, but do not appear to have archaeological reports. These are U13/593 (a pit site) and U13/903 (a cultivated garden). The dates are both 16th to mid-17th century.

A further major pa excavation has been carried out at nearby Ongare Point (U13/8). This cliff-edge pa with ditch and bank defences in three defensive units is notable for a huge shell midden along its seaward side—so large that it has been mined for chicken grit. Shawcross (1964, 1966) concentrated on the interior areas, finding intense pit building, with intercutting pits. The structures could be sorted into seven stages, starting with cultivation of the site and some oven building, followed by four stages of pit building, the latest of which had near-contemporary garden soil creation. In the next stage, burials were undertaken on the site, and Shawcross (1966: 640) suggested that the area must have been otherwise unused at this time. Lastly, the site was reoccupied with large-scale preparation of shellfish. The defensive earthworks are associated with this stage; however, since Shawcross only sectioned an internal defence, it is possible there were earlier perimeter defences. Indeed, the intensity of the pit construction on a defensible site must make this likely. The site is undated. The lack of any European artefacts led Shawcross to conclude it is not the site of the 1842 raid of Taraia (see below), as had originally been hoped.

The Athenree area has also been the focus of some archaeological attention. On the outskirts of a pa at Roretana (U13/50), McFadgen (1982) identified two cultivated soils. One had articulated shell dug in, believed to be contemporary and dated to between the mid-16th century and the end of the 17th century. The second was overlain by a shell midden, and shells from this have been dated to between the mid-15th century and the mid-17th century. In the C14 date list, there is a record of a date on T13/31, which is described as from a midden above a cultivated soil; this dates to between the mid-16th and mid-17th centuries.

Anatere Pa (U13/46) has been the subject of a series of investigations in the face of progressive destruction. These have been summarised by Phillips & Allen (1996a, b). Although the site is a pa on a sea cliff margin with a flight of seven low internal terraces, the initial occupation, which has been dated to the early 16th century, was an undefended site. This was first used as a small terrace where gardening, pit storage and cooking took place, and fish and shellfish resources from the harbour and ocean were exploited. The major terraces and the fortifications were formed subsequently, dating to around the late 16th to early 17th centuries. The intercutting pits and other features demonstrate that the site was occupied for some time, and indicate three stages of construction. The authors suggested a 50-year duration of occupation. The defences were a ditch and bank, with two palisade lines on and inside the inner bank.

The terraces had different uses. One was largely used for storage structures, while others had a mixture of houses that were used for cooking as well as storage. The pits included larger rectangular pits, small bin pits and rua. Marine resources from varying localities were used.

A large amount of obsidian was obtained from the site, and it was determined that this primarily came from two local sources—Waihi and Mayor Island (Tuhua). The proportions of each type of obsidian varied between locations in the site, but there was no clear pattern over time.

The site was apparently disused until it became farmland. Three other pa at Athenree were sampled for carbon dating by McFadgen (1982). In each case, the dated material was obtained from below banks of ditch and bank defences. All three samples had similar ages, from the early 16th to the end of the 17th centuries, dating the period of occupation to before the defences were built.

The picture from the Katikati/Athenree area is one of use of both the marine resources of the harbour and the horticultural products of the soils of the area for sustenance, starting from the 15th century. There is direct evidence of gardening, with cultivated soils identified and dated, and supporting evidence provided by storage pits. Undefended occupation spread over the entire lowland area. This preceded fortification on several coastal sites that were well suited to fortification. Fortification appears to have begun in the early 16th century and is concentrated on coastal cliff sites where there was some natural defence. Ditch and bank defence dominated from the earliest stages of construction. The interior of pa were often intensively used for pit storage, showing the importance of securing food supplies during times of stress. Occupation in this area spanned the period of development of

the later styles of combs from the Kauri Point site, and included the use of manaia decorative elements in carved objects. There was then cultural change following the commencement of this pattern of use. However, the basic settlement pattern and economic base appears to have been stable over this period. From a wider environmental perspective, it seems likely that there was widespread destruction of coastal forest and an early retreat of the bush-line to the foot of the Kaimai Ranges, leaving a climatically benign coastal zone with widespread fern and, at best, only regenerating forest.

10.2 RUAHIHĪ

While there has not been as much archaeological work in this area as at Katikati, Ruahihi Pa (U14/38) (McFadgen & Sheppard 1984) is important in showing how a site and its local area that was well inland from Tauranga Harbour was occupied and used. The site name derives from the area rather than being a traditional name for the pa itself. Although inland, it was within the navigable limit of an adjacent river, so access to Tauranga Harbour was available. The site had a long sequence of occupation and because it was never very intensively used, many features have survived better than in many of the coastal pa.

The site had an inner defended area on a promontory and an outer area, some of which was within a further ditch and bank-defended area. The site was covered in a garden soil that pre-dated the fortification bank. Gardening continued on the site after fortification. Most of the rua, pits and houses found overlay or were cut through the garden soil. The sequence of fortification development began with a palisade line in the outer area. This was later cut by a ditch and bank. On excavation, no palisade was detected within this defence, but as the bank had been lowered by bulldozing, the evidence may have been lost. The inner defended area may be contemporary with either of these fortifications, but there was some prior occupation of this area before its fortification. Law (1984) also commented on the history of this site.

The inner trench was later partially infilled deliberately, but most of it infilled naturally during the occupation of the outer area. Features associated with this occupation included cooking areas, which were separate from areas with rectangular pits. The pits had been infilled after use. In contrast, rua had not been deliberately infilled. Several shell middens were also present. Unusual finds were a burnt fishing net and two fishing sinkers, which indicated that marine resources from the harbour were important to the inhabitants of the pa. Several house plans were uncovered, some with cache pits within them. Carbonised remains of the roof structure were found in some of the house sites, with fire-reddened earth lying over them. The authors believe that these houses had earth covers on their roofs (McFadgen & Sheppard 1984: 39).

The occupation sequence commenced close to the end of the 16th century and continued into the historic period, demonstrated by the fact that iron fragments were found in two of the houses. Immediately outside the inner defences of the promontory, fortifications do not seem to have been present for most of the period of occupation of the area. This outer area was used

for gardening and living. Pits appear to be absent from the middle part of the sequence, but McFadgen & Sheppard (1984) noted that this may be because they were located in an unexcavated part of the site.

Pollen and land snail remains indicate that the site had forest or forest scrub vegetation when first occupied, with bracken fern becoming dominant by the 18th century. Seeds of several different food plants were recovered in the excavation, including rimu (*Dacrydium cupressinum*), hinau (*Elaeocarpus dentatus*), matai (*Prumnopitys taxifolia*) and tawa (*Beilschmiedia tawa*), but not karaka. Some of the rua had layers of charcoal in their bases from the burning of bracken, grass and manuka. McFadgen & Sheppard (1984) made a case for the rua being used for smoke preservation of edible fruits.

Ruahihi Pa is a very important site in terms of the range of evidence preserved, particularly relating to plant use. The site demonstrates that pa often have a history other than that directly related to defences. The long-term reuse of the area for gardening, storage and occupation, and its continued connection with marine resource use indicate a well-defined and settled pattern of use of the inland area that was associated with use of outlying areas and the harbour. The attraction of the site for occupation probably related to the combination of access to forest resources, access to the sea via the adjacent river and the security provided by the readily defensible promontory.

10.3 MATAKANA ISLAND

On its Tauranga Harbour side, Matakana Island is composed of consolidated Pleistocene sand dunes. This area has many pa sites (McFadgen & Walton 1981). The remaining seaward part of the island is more recent and composed of accumulated sand. A research project led by Prof. D. Sutton (University of Auckland) has investigated both parts of the island, but with a particular focus on the more recent sand part (Marshall et al. 1993a, b; 1994a, b). This area has a very high density of midden sites. Carbon dating of charcoal preserved in the sand has demonstrated that this part of the island was once under mature forest, including kauri in the northern part. A substantial amount of Kaharoa ash fell on the area. At some time after the deposition of this tephra, the area was deforested, probably as a result of clearing by Maori. Unlike other coastal dune areas that have been deforested in the last 1000 years, the sand in this area has not remobilised, other than in a few localised areas (Shepherd et al. 1997). Apparently, replacement of forest by scrub vegetation and fern, as revealed by the charcoal identifications from the middens (Wallace 1999), was sufficient to protect land surfaces and prevent sand remobilisation. However, the picture is somewhat confused by the continued presence of forest timber in archaeological samples. Wallace (1999) made the case for this being the result of ongoing use of wood from stumps left from the earlier forest.

The sites investigated by the Sutton-led team on the sand part of the island turned out to be more than simple middens. While none of the sites were investigated using area excavation over large areas, vertical profiles indicated that many of the middens were deposited over cultivated soil and that

gardening had continued at many of the sites after the deposition of the midden (Marshall et al. 1993a). In these sites, the Kaharoa ash was rarely found intact; rather, it had been mechanically disturbed (as it is generally elsewhere on Matakana Island) (Froggatt 1994). In a few places, midden material has been placed directly over intact Kaharoa tephra, but has never been found beneath it. Other middens appear in soil profiles in positions that indicate much more recent deposition. Middens on the dunes and dune ridges were found to be larger and more varied in composition than those in low-lying areas. These may indicate preferred occupation sites and the longevity of occupation. Pits were found at some of the sites investigated and two sites that only had pits were found in excavations where there was no previous surface indication of pits (Marshall et al. 1994a, b). Some of the middens included fish bone (see Appendix 4 and Leach et al. 1994).

Marshall et al. (1994a: 23) described the period of human occupation of Matakana Island as having a devastating effect on the land. However, this description must be tempered in comparison with other North Island coastal land where sand remobilisation following vegetation clearance really was hugely damaging to the local coastal environment, such as the land behind Ninety Mile Beach on the west coast of Northland (Coster 1989: 70). Marshall believed that pit and terrace sites may well turn out to be common in the sand area of Matakana Island, but noted that they are difficult to identify from surface features.

These studies have revealed an unexpected archaeological landscape. It would appear that the combination of the forest soils and the Kaharoa ash provided an environment favourable to Maori gardening, which seems to have been taken up over the greater part of the area, although bracken fern root harvesting and later kauri gum digging cannot be excluded as a source of some of the soil disturbance. A variety of obsidian hydration dates have been obtained for obsidian samples obtained from middens, falling between late 17th and early 19th centuries, although there is some error associated with these dates.

A pa site, Ureturituri (U14/187), on the harbour side of the island, was also investigated during Sutton's research programme. It is a ditch and bank-defended, cliff-edge pa, very much in the style of those of the Athenree/Katikati area. A geophysical survey (Ladefoged et al. 1995) identified what appears to be an inner defensive trench on the site, now infilled, but this has not been tested on the ground. Rather, sections of the standing ditch and bank and a separate area within the apparent inner defence area have been excavated.

The bank section indicated four phases of occupation, starting with a thin layer of charcoal and burnt shell, through which the ditch was cut. A period of erosion followed, then the site was reoccupied, with construction of two pits followed by their infilling, in part by widening of the bank (Anon. 1993). Finally, some terraces were cut into the bank. There is a charcoal carbon date from beneath the bank, which dates its construction to some time between the mid-16th century and the early 19th century.

Marshall et al. (1994b) considered the inner, non-investigated ditch to be the older line of defence, presumably on the grounds that its infilling allowed

use of more interior space inside a later and larger defence perimeter. This explanation is not unassailable, as it may have been one of two concurrent lines of defence that later occupiers decided to dispense with.

The inner area excavation (Petchey 1993b) revealed a complicated sequence. The earliest use involved construction of large rectangular pits and rua of the form excavated in the sides of pits. There then appears to have been a hiatus, followed by construction of a slight surface structure containing a cooking-fire scoop. This was followed by a series of medium-sized rectangular pits, again with associated rua, and a rectangular surface structure. More rectangular surface structures with associated fire scoops followed. After this were some small pits and then a further surface structure. The surface structures left rectangular dark patches with post holes that can be related to them. These were most likely house sites. Most recently, the area had been cultivated using a single-tyne plough.

Obsidian hydration ages on material from this area vary from 170 to 320 years BP (i.e. from late 17th century to early 19th century) (Jones 1994). The relationship of these ages to the excavated sequence of structures has not been published.

Petchey (1993b) aligned the sequence at the bank excavation with the earlier part of the inner area sequence, which is contrary to the interpretation by Marshall et al. (1994b) that the excavated bank was part of a later defence of the site. The dating evidence can be interpreted either way.

Midden material was available from much of the sequence through the inner area (Pepa 1993), though the individual numbers of particular shellfish in the samples were often small. All of the samples had a diversity of shellfish species, with ocean beach and harbour species mixed together. The proportions of particular species in samples and the sizes of the common species did not show any patterns or changes over time. This suggests a fairly steady state of use of the shellfish resource.

Although these various studies at Matakana are mostly in preliminary working paper form, they are still valuable. They reveal a surprisingly extensive use of the recently stabilised sand dune area. The sand area was used for more than just the occasional consumption of shellfish. It also seems to have been used extensively for gardening and associated uses, including the construction of storage structures. Occupation of the excavated pa appears to have been contemporary with use of the sand area. The form of the pa and their intense history of use is similar to that of the pa reviewed in the Katikati/Athenree areas. The pa in the two areas were of the same age. What distinguishes the Matakana area is that occupation of the island cut off the residents from ready access to the remaining forest resources along the Kaimai Ranges, so they would have had to bring in even such basic resources as oven stones. The advantages bestowed by the soils and the good marine access must have overcome this, as site density in the sand area is no less than it is on the inner side of the harbour.