6.6 TONGARIRO/TAUPO

Little is known of the range of gardening sites in the Taupo area. There are 14 gardening-related records in the NZAA site file (Fig. 25), but some of these are doubtful or their function has been incorrectly assigned to gardening. Stone rows and modified soils account for 10 of the 14 recorded sites. Storage pits are present (Fig. 26), indicating that gardening was able to be carried out here, just as it was in the Rotorua lakes district.

Figure 25. Distribution of recorded Maori horticulture-related archaeological sites, Tongariro/Taupo Conservancy region, Department of Conservation. Map: C. Edkins, DOC.
Figure 26. Distribution of recorded archaeological sites with kumara storage pits, Tongariro/Taupo Conservancy region, Department of Conservation. Map: C. Edkins, DOC.

6.7 Wanganui

The range of gardening sites is poorly represented in the Wanganui region. Borrow pits dominate the archaeological evidence of gardening, accounting for 82% of the 78 recorded sites (Fig. 27). By inference, records of modified sand-added soils should be present in equal numbers, but such sites are not well represented in the records. Only the better soils were modified by adding sand, but soils without additives also appear to have been used (Walton & Cassels 1992).

Borrow pits are most frequently found in south Taranaki, between the Manawapou River and the Waitotara River, where sand was taken from underlying dune ridges and added to tephra-derived loams on the surface (Walton 2000). They are relatively rare in north Taranaki. Buist (1993) considered that this anomaly was due to the absence of pronounced dunes in the north, so that the borrow pits were confined to river terraces where coarse river sand and pebbles were extracted.

Stone rows were noted in the Warea area in the 19th century, but these no longer exist (Walton 2000). They were probably removed by European farming activities.

The distribution of storage pits (Fig. 28) in undefended sites and pa mirrors the pattern for borrow pits. There are fewer undefended sites with associated pits in north Taranaki, but there is a large number of pa present. However, whether these pa sites contain large numbers of storage pits is not known.
Figure 27. Distribution of recorded Maori horticulture-related archaeological sites, Wanganui Conservancy region, Department of Conservation. Map: C. Edkins, DOC.
Figure 28. Distribution of recorded archaeological sites with kumara storage pits, Wanganui Conservancy region, Department of Conservation. *Map: C. Edkins, DOC.*
6.8 WELLINGTON

The Wellington region has widely varying environmental conditions and is best addressed as several sub-regions, including the Horowhenua coast, the greater Wellington city area, and Palliser Bay and the coastline north through Wairarapa. With the exception of the Wairarapa area, the evidence for gardening in most of the Wellington region is sparse. A total of 94 gardening-related sites have been recorded, of which 82% are stone rows (Fig. 29). Of the few storage pit sites that are recorded, most are clustered around Porirua, although they are also present in the Wairarapa (Fig. 30).

The Horowhenua coastline has documented historic cultivation of kumara and taro (and European-introduced crops) but there is no archaeological evidence for this. However, gardening sites may still be present, buried under recent dunes. Wooden gardening tools have been recovered from some water-logged sites, indicating that gardening was carried out. Few storage pits have been recorded (McFadgen 1997).

Terraces, thought to have been constructed and used for gardening, are present at Whitireia Peninsula, Porirua. Excavations showed that natural terraces had been modified, and although the evidence did not conclusively indicate gardening, this is considered to be the most likely explanation (Walton 1992).

Stone rows and modified soils have been recorded on Kapiti Island, but may be historic. Similarly, rows have been noted at Fitzroy Bay on Wellington’s south-east coast, but these may have a natural origin and be part of an old shoreline. However, in the same area, there are also rows on the coastal platform that run at right angles to the shoreline and are undoubtedly cultural in origin.

The most extensive evidence for gardening is from the Wairarapa coast. The coastal platform, with shingle fans and marine-deposited stones, gravel and sand, has stone rows and mounds at many locations. These are usually associated with stream mouths. The most concentrated evidence is on the section of coast from Cape Palliser to Lake Onoke, where the platform is continuous and wide. These sites are well known through the Wairarapa Archaeological Research Programme, in which there was an emphasis on horticultural sites (Leach, B.F. & Leach, H.M. 1979; Leach, H.M. 1979a).

Less well known is the area from Flat Point to Cape Palliser, where large and well-preserved stone row systems are also present. Several sites, such as Okoropunga and Tora, have been investigated (McFadgen 1980a, 2003). The coastal platform on this section of coastline is discontinuous and narrower than further south. There are no gardening sites on the coast north of Flat Point, as the coastal platform is absent or very narrow, and steep hills border the coast (McFadgen 2003). The stone rows of the Wairarapa are situated on old beach ridges that make up the coastal platform, or on old shingle fans that spill out of the hills behind. Suitable sheltered valleys are rare in this area of steeply dissected hills, but where the right conditions exist, gardening sites are present on the valley floor and lower slopes.
During the Wairarapa Archaeological Research Programme, 15 garden sites were mapped: 12 on the coastal platform (Leach, H.M. 1979a), two in the Makotukutuku Valley (Leach, B.F. 1979) and one in the Moikau Valley (Prickett 1979). Mapped sites vary in size from Waiwhero (7 ha), to Black Rocks (16 ha). This latter site is the largest garden complex in Palliser Bay (Leach, H.M. 1979a: 155). The evidence at these garden complexes consists primarily of stone rows oriented at right angles to the coast. At a few sites, the addition of cross-rows formed enclosures. In some instances, e.g. at Pararaki, cooking and domestic evidence have been recorded in association with the gardens. Only rarely were soils on the Palliser Bay coast modified by the addition of extra sands and gravels, but charcoal was well incorporated into the soil profile. Mounds are rare and present at only a few sites (e.g. Makotukutuku Valley and North Waiwhero). Stone paving, which has been interpreted as a footpath, has also been excavated. Three sites with modified soil, but without associated stone rows, were recorded in Palliser Bay.

Excavations were conducted at seven coastal garden complexes (Black Rocks, North Waiwhero, North Kawakawa, South Pararaki, Te Humenga, Washpool and Whatarangi) where stone rows, mounds and soils adjacent to gardens were investigated. Evidence of environmental degradation was apparent; in some instances, garden soils and stone rows were covered by silt and sand. In addition to the stone row garden systems of the coastal platform, there are also garden sites in the Makotukutuku Valley that are of different form and probably of later age. One such terrace was excavated at the Washpool Terrace Garden, and a deep modified loam soil was found (Leach, B.F. 1979). A stone mound at the Washpool Cross site was found to have been constructed over an earlier modified soil, and contained a posthole thought to have been for support of a gourd vine (ibid). Both of these sites were c. 2 km inland from the coast.

Excavations at Okoropunga revealed a soil modified by the addition of marine gravel and constructed over existing stone rows. In contrast to the sites in Palliser Bay, the soils at Okoropunga did not have significant amounts of charcoal present through the profile, and the presence of gravel-added soils and borrow pits distinguish them from other sites (McFadgen 1980b). It is also likely that gravel was added to soils at Pukaroro Maori Reserve, c. 1 km north of Okoropunga (K. Jones, DOC, pers. comm.).

The Palliser Bay sites are notable for being well-preserved examples of garden plots and Polynesian horticultural practices related to the period between the mid-14th century and the end of the 15th century. Many of these gardens appear to have been used only once, and there was no later modification to the original plot layout. The sites on the coastal platform were abandoned—H.M. Leach & B.F. Leach (1979) suggested that climatic and landscape deterioration was
Figure 29. Distribution of recorded Maori horticulture-related archaeological sites, Wellington Conservancy region, Department of Conservation. Map: C. Edkins, DOC.

responsible in what was always a marginal area for gardening. New research based on geomorphology suggests that landscape changes induced by seismic and tsunami events may have been a contributing factor to the abandonment of the coastal Wairarapa area (McFadgen 2003), but this has not been proven archaeologically. The sites are largely intact and many are well mapped. Terraces, middens and living structures exist within the gardens. These sites are, therefore, a relict archaeological landscape, primarily because they collectively capture an economy at a defined period in time. As such, their importance cannot be understated.
Although gardening was no longer carried out on the coastal platform of Palliser Bay, it continued to be practised in the wider area, but centred on small valleys and on the inland plains, rather than the coast. There are records of storage pits and accounts of historic gardening on the east side of the valley south of Carterton (McFadgen 2003). Storage pit complexes in the Wairarapa Valley tend to be associated with ditches, banks and scarp defences (Leach, H.M. 1979a).

None of the recorded garden sites are on protected land, although the Pukaroro site is a Maori Reserve.
In total, 71 sites related to gardening are recorded in the Nelson/Marlborough region (Figs 31 and 32). Twenty-five of these are stone rows or rows, and 39 are modified soils. The evidence can be split geographically. The primary form of gardening evidence in the Nelson area is modified soils, but in the Marlborough Sounds, D’Urville Island and the east coast of Marlborough, stone rows are more

Figure 31. Distribution of recorded Maori horticulture-related archaeological sites, Nelson/Marlborough Conservancy region, Department of Conservation. Map: C. Edkins, DOC.
common, although modified soils also occur. Borrow pits are rarely reported in the records: there are only four sites in the Nelson area and none in Marlborough. However, the level of recording does not reflect the incidence of borrow pits in relation to soils; instead, it is due to borrow pits being ploughed out, or the fact that most of the locations for the modified soils are taken from soil maps and have not been ground checked. Stone mounds are rare in this region.

Figure 32. Distribution of recorded archaeological sites with kumara storage pits, Nelson/Marlborough Conservancy region, Department of Conservation. Map: C. Edkins, DOC.
The majority of the recorded sites are in the Nelson area (including D’Urville Island), with fewer sites in Marlborough. Within the Nelson lowlands area, the principal horticultural site type is modified garden soil, where gravel and sand have been added to silt loam soils (Challis 1976). Several modified soils are recorded in this area, but it is obvious that further sites are yet to be located, or that gardening took place without the need to alter soil texture. Similarly, storage pit sites are distributed throughout Golden Bay, but direct evidence of gardening is under-represented. A detailed analysis of gardening sites in the Motueka area is presented in Challis (1978: 28–29). It is worth noting that some storage pits reported in the literature have been found to be sunken dwelling sites when excavated (Challis 1991: 105-106).

Stone rows on D’Urville Island are situated on old shingle fans at Manawakupakupa and Opotiki Bays. General occupation evidence, including storage pits, is present in addition to the rows. At Opotiki Bay, the rows run across the slope, while those at Manawakupakupa (which cover 2–3 ha) are oriented up and down the slope but are less ordered than those at Opotiki (Prickett & Prickett 1975: 123). Storage pits are present in large numbers in this area. In contrast, in the north-east part of the island in an area of rich soils, no surface evidence of gardens was seen in 1840. This demonstrates, yet again, the difficulty of assessing the horticultural potential of an area from the remaining field evidence of gardening. Modified soils were noted in association with the stone rows, and were also reported from Greville Harbour (Challis 1991: 102).

In Marlborough, the evidence is predominantly of stone rows. Well-known investigated sites include Titirangi and Woolshed Flat in the Marlborough Sounds and the complex of sites in the Clarence area on the east coast. The rows at Titirangi formed enclosures, which contrasts with the usual parallel lines more commonly reported elsewhere. Again, these sites are located on shingle fans adjacent to the coast. The Cattleyards Flat site has been described by Trotter (1977) as ‘...probably the most impressive garden site in the South Island, it comprises an extensive complex of stone and earth rows, mounds and middens’. Within the garden plots, the soil had been modified by the addition of pebbles.

The sites at Clarence River, on old raised coastal terraces, are present over a distance of c. 5 km and consist of stone rows, modified soils and borrow pits (McFadgen 1980a; Trotter & McCulloch 1999b). It has been estimated that P30/5 alone covered an area of 10 ha (Trotter & McCulloch 1979), but the site has been partially destroyed by ploughing. Earth rows, in addition to those of stone, have been recorded (see section 7.2).

Sites with storage pits are more numerous than garden sites (Fig. 32). Golden Bay and the Marlborough Sounds have concentrations of storage pits, but this may be an artefact of site surveying. Storage pits are in association with stone rows at Robin Hood Bay and at Seventeen Valley near Wairau (Brailsford 1981: 74, 77). Garden sites are expected to be present in larger numbers, but perhaps without the highly visible stone rows.
6.10 CANTERBURY

Within the Canterbury region there are only 17 recorded garden-related sites (Fig. 33), and four possible sites without NZAA site file numbers, as recorded in Challis (1992: 108). These include stone rows and borrow pits (Harrowfield 1969; Brailsford 1981; Walton 1985a; Trotter & McCulloch 1999a, 2001; Gordon et al. 2004). The evidence in north Canterbury is sparse and similar to that present on the Marlborough east coast. Borrow pits and modified soils are evident at Woodend and Tuahiwi near Kaiapoi, and possibly at Gore Bay (Walton 1985a; Challis 1992; Trotter & McCulloch 2001). The gravels accessed at the Woodend and Tuahiwi borrow pits were alluvial rather than from old beach ridges (C. Jacomb, Dunedin, pers. comm.).

The southernmost gardening evidence is adjacent to Lake Ellesmere. The bays of Banks Peninsula have warm, frost-free and sheltered coastal microclimates, which were favourable to gardening, but most of the garden sites are in the northern and eastern valleys, possibly because other factors, such as sea access and exposure to the south, placed limitations on settlements in south-facing bays. The gardening evidence is of earth and stone rows, of which the largest complex is at Panau, covering an area of c. 16 ha (Jacomb 2000). Stone rows have been reported from Menzies Bay, Stony Bay, Ducksfoot Bay, Goughs Bay and Paua Bay (Harrowfield 1969), and Island Bay, and most recently from Flea Bay, to the east of Akaroa Harbour. Shallow, parallel trenches are known from Paua Bay and Lavericks Bay. However, storage pits are rare on Banks Peninsula (Fig. 34) (Law 1969; C. Jacomb, Dunedin, pers. comm.). Modified soils are present at Okuora Farm near Birdlings Flat, near raised-rim storage pits and what appear to be borrow pits on the old beach ridges below. Possible kumara phytoliths have been identified in these soils (Gordon et al. 2004). Borrow pits have also been recorded at Taumutu near the western end of Kaitorete Spit at Lake Ellesmere (Trotter & McCulloch 1999a). These pits cover an extensive area, extending in two lines for c. 1 km along an old beach ridge, and modified soils have reputedly been found in the vicinity. If this site does indeed represent the southernmost extent of pre-European Maori kumara gardening in the South Island, then its size is quite remarkable. The number of borrow pits here is far in excess of the number found at Woodend, where there is a maximum of seven definite and nine possible borrow pits (Walton 1985a), and the 400 m × 20 m strip at Tuahiwi (Trotter & McCulloch 2001). The pits indicate that there must have been very extensive areas of modified soils and gardens right at the limit of tolerable growing conditions. Further work needs to be done at this site, particularly on descriptions of soil profiles, examination of soil samples for microfossils and mapping of borrow pits. It would also be useful to have a geomorphologist assess the site, and to evaluate other possible explanations for the origin of the pits.

None of the gardening sites in the Canterbury region are on protected lands (Challis 1992).
Figure 33. Distribution of recorded Maori horticulture-related archaeological sites, Canterbury Conservancy region, Department of Conservation. *Map: C. Edkins, DOC.*
Figure 34. Distribution of recorded archaeological sites with kumara storage pits, Canterbury Conservancy region, Department of Conservation. Map: C. Edkins, DOC.
6.11 Other Southern Regions

There is one record of stone heaps at Okarito on the West Coast. This feature is more likely to be remnants of ovens rather than gardening evidence. Similarly, a stone pile in Otago, which has been recorded as being garden-related, is probably an oven, and deep sand containing shell at Aramoana is unlikely to be a pre-European Maori gardening site; instead, it probably represents a build-up of occupation-related deposits.

7. Case studies

This section provides several more detailed case studies that have been selected to cover both site type and region. It was not the intention to identify a few sites that stand out as being important or more significant than other sites. Choices were made to cover geographic distribution, site type and a range of archaeological interest. These sites are not isolated in the landscape, but form part of the wider cultural settlement pattern, and the intention was to discuss selected garden-related sites or groups of sites in the context of the local landscape. Where the sites, or group of sites, have been investigated archaeologically, this work is described.

Selections were carried out partly on the basis of information contained in site records, i.e. some sites were identified as being well preserved, having a range of information and being representative of the site type for that locality. Available archaeological investigation or surface study plus mapping also influenced the choice of site. Geographic spread from the far north to the very southern limits of horticulture was also considered. For instance, Panau was selected because it was well preserved and at the southern extreme of viable horticultural activity. Clarence River was also selected because it was of large extent, represents a range of material, including stone rows, borrow pits and modified soils, together with other occupation evidence, such as storage pits and terraces, and has been studied archaeologically. The sites of Okoropunga and Pukaroro were selected to complement the Palliser Bay sites in the discussion of horticulture in the Wairarapa region. The stone row systems at Cape Runaway were chosen because they are unique on this part of the coastline and have had little archaeological interest expressed in them and warrant more attention. The slope trenches at Rangihoua in the Bay of Islands were selected because they have been mapped in detail and are representative of this site type in Northland.

The case studies are only examples of their site type. Other sites or garden-related landscapes are no less significant. Not all sites of merit could be included—some places are already well known as outstanding landscapes; for example, the Pouerua garden area together with its associated kainga and pa, or the well-studied garden sites of Palliser Bay on the Wairarapa coast.
7.1 PANAU, BANKS PENINSULA

7.1.1 Location
North side of Banks Peninsula overlooking a small bay to the east of the entrance to Little Akaloa Bay, on north-west-facing slopes.

7.1.2 Condition
The garden site and Panau Pa (Fig. 35) are under a land management system of pastoral farming, predominantly being grazed by sheep. Recent fencing across and down the contours may affect the condition of the features in the long term, especially if sheep form tracks along fence lines, or smaller paddocks lead to intensification of stocking rates at particular times of the year. There is some slumping at the southern end of the site.

Figure 35. Plan of slope trenches (N36/74) at Panau, Banks Peninsula. The south-eastern group is partly constructed from stone. Panau Pa (N36/73) separates the two groups of lines. The Panau settlement is on the foreshore, identified as ‘excavation area’. After Jacomb 1995.
7.1.3 Description

The gardens (N36/74) consist of parallel rows of either stone or earth (Figs 36 and 37). These are barely distinguishable, except in certain low-light conditions and on closely cropped grass. The stone has been used to form narrow alignments rather than rows composed of many stacked rocks. They fall naturally into two groups: one group at a higher contour to the south of Panau Pa (N36/73), and a lower group to the north of the pa, descending on steeper slopes to just above Panau village (N36/72). The southern group incorporates stone from the outcrop of basaltic stone near the top of the broad ridge, with stone and earthen rows descending across the contours from c. 70 m a.s.l. to the head of a gully. Use of stone is confined to the upper slope, close to the stone source (Fig. 36). The distance north-south is close to 300 m. The northern group, at a slightly different orientation, more closely matched to the ‘ditch’ of the pa, are composed of earth and extend for c. 150 m across the slope and the same distance down (Fig. 35).

Soils in the area are yellow-grey earths derived from loess and the underlying basalt. There is no known evidence of a modified soil associated with rows. The soil profile in an exposed section through a stone alignment was interpreted by Jacomb (2000) as being largely undisturbed. There was, however, a greater depth to the topsoil adjacent to the stone alignment. Jacomb (2000: 98) concluded that the crops must have been grown on or immediately adjacent to the stone

Figure 36. South-eastern set of slope trenches, Panau, with stone outcrops on the slope above. The two children are standing on trenches, which can be seen running under the fenceline. Photo: L. Furey.