Archaeology of the Taranaki–Wanganui region

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Abstract

The coastal areas of the Taranaki–Wanganui region were among the most densely settled parts of New Zealand in prehistoric and early historic times. Settlement probably began in about the 14th century and the region experienced a rapid rate of population growth that had probably peaked by the late 18th century. Occupation was widespread by the 16th century with local economies based on fishing, hunting and gathering, and gardening. Fortifications probably began to be built in about the 16th century and remain a conspicuous feature of the present day landscape. The landscape has been transformed over the last 150 years but, apart from fortifications of the New Zealand Wars, this period and its archaeological remains have attracted less interest from archaeologists.

Keywords: Taranaki, Wanganui, New Zealand, archaeology, historical archaeology, site distributions, settlement patterns, subsistence, moa-hunting, horticulture, pa, pits, population growth, radiocarbon dates

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1. Introduction

1.1 SCOPE

People have lived in the Taranaki–Wanganui region for at least 700 years. The coastal areas were among the most densely settled parts of New Zealand in late prehistoric and early historic times. Yet, deterred by the unfamiliar sources of evidence, mostly oral traditions and archaeology, many history books cover this considerable period in a brief introductory chapter. This study provides a synthesis of the information on the early history of the region based primarily, but not exclusively, on archaeological discoveries. As with similar archaeological resource statements overseas (Newman 1996; Glazebrook 1997), it makes no pretence to provide a full and detailed account of every aspect of the subject.

The Taranaki–Wanganui region is that area encompassed by the Department of Conservation's Wanganui Conservancy (Fig. 1) and comprises some 20,000 km^2. Modern administrative boundaries are not particularly meaningful in historical terms but the region does correspond broadly to three 'kin zones' of the late 18th century (Belich 1996: 94). In the north were Te Atiawa and the associated iwi of Ngati Mutunga, Ngati Tama, and Ngati Maru. In the middle, were Taranaki, Nga Ruahine, Ngati Ruanui, and Nga Rauru. In the south, there were the iwi of Whanganui and Ngati Apa.

1.2 SOURCES OF INFORMATION

The major sources of information are the New Zealand Archaeological Association Site Recording Scheme, which at present contains information on some 2000 sites throughout the region, and both published and unpublished reports on the archaeology of the region. While this is an invaluable body of information, it has limitations. Overall, an understanding of many aspects of the archaeology and prehistory of the region is still very restricted. Many activities leave few traces in the archaeological record and there is a range of questions about the past that archaeology cannot answer because of this. The most recent review of aspects of the prehistoric archaeology of Taranaki (Prickett 1983b), however, identifies a number of major themes including moa hunting, fortifications and warfare, and wood carving. There is no comparable review of the archaeology of the Wanganui and Manawatu areas.

The approaches employed by archaeologists to excavate, analyse, and date the physical traces and the frameworks they use to order and interpret data do not produce conventional narrative history. In describing or interpreting a sequence, decisions have to be made about what constitutes significant change, about how quickly or slowly it occurred, and about the relative importance of different sorts of changes. This provides a basis for dividing time into meaningful units (Wilson 1993). Various long-term and short-term trends can be identified in the archaeological record and these collectively mark the transition from the early to the late prehistoric period. Some artefact forms can be divided

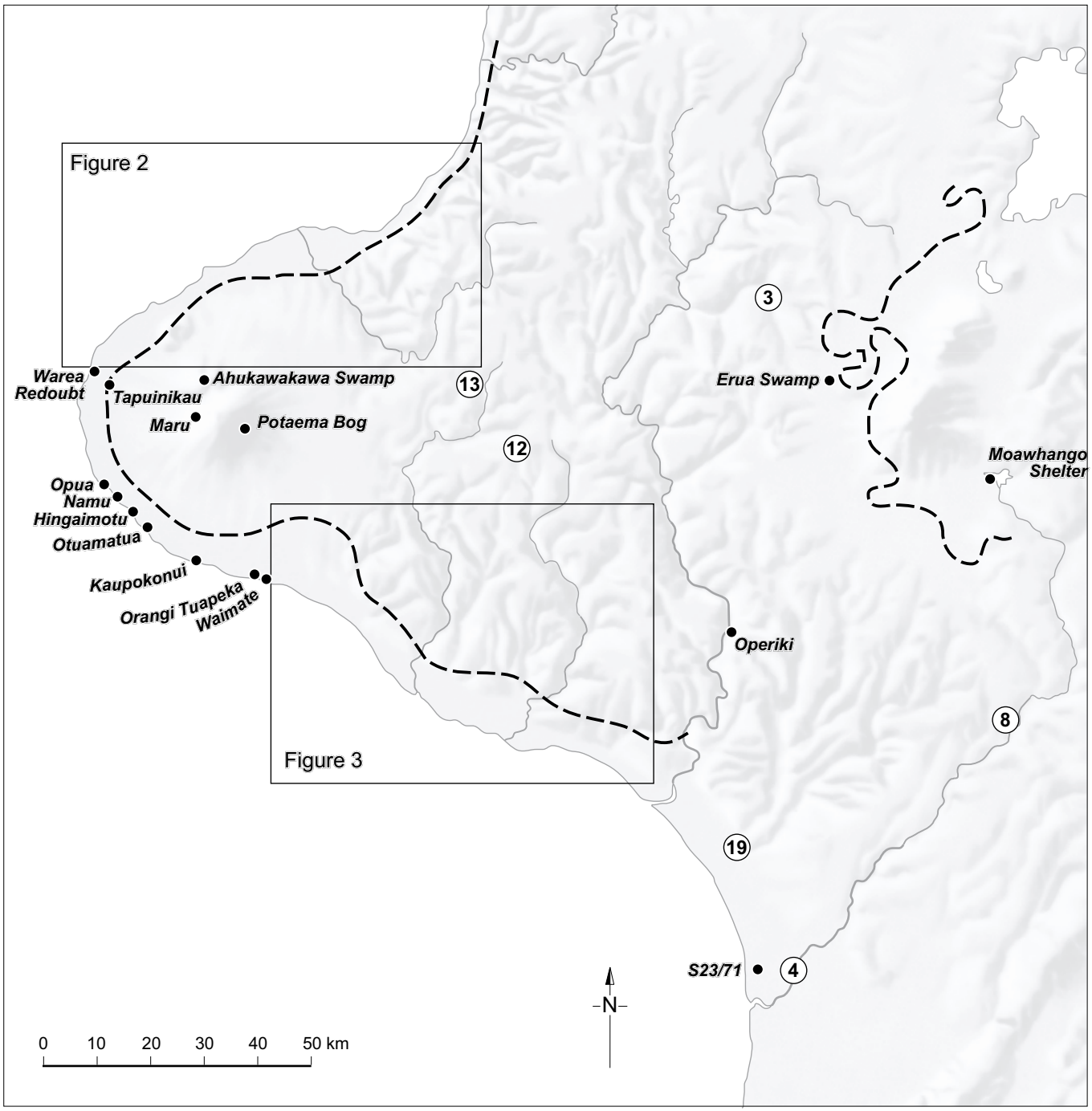

Figure 1. The Taranaki–Wanganui region showing places named in the text and the location of archaeological surveys.

roughly into 'early' and 'late' forms but there is a suspicion that too much may be read into too little where artefacts are concerned. The current tendency is, however, to avoid period labels in favour of a straightforward chronology based on radiocarbon determinations.

Few radiocarbon dates have been reported for the Taranaki–Wanganui region. Of 271 archaeological samples dated at the University of Waikato Radiocarbon Laboratory between 1975 and 1995 and reported by Higham & Hogg (1997) none are from Wanganui–Taranaki sites. There are currently 54 radiocarbon dates from 22 sites available but many were submitted decades ago when the limitations of radiocarbon dating were still poorly understood. There are, consequently, some significant problems in the interpretation of these dates

(Anderson 1991; McFadgen et al. 1994). Uncertainties in dating the occupation of particular sites are frequently encountered. It has long been recognised that radiocarbon dates have poor precision in relation to the short duration of the New Zealand prehistory and that this limitation is even more crucial if, as is argued below, change occurred rapidly through most of the prehistoric period.

There is little doubt of the speed and scale of the changes that must have occurred, particularly in about the 15th and 16th centuries, but Davidson (1993: 242) has noted that 'the move to regional studies has not necessarily always lead to clearer thinking about ways of organising the data.' Attempts to document regional sequences often run into a scarcity of evidence, resulting in the need to generalise unduly from isolated facts. Only a larger sample of excavated evidence will determine if results obtained to date are representative. A detailed picture of change within the Taranaki–Wanganui region based primarily on local data is not possible and conventional models of New Zealand prehistory, particularly the ecological approach of McGlone et al. (1994), must be used to provide a framework. This brings a danger of forcing the regional data into preconceived patterns based on developments documented elsewhere.

Traditionally, there have been two predominant approaches to studying the prehistoric past in New Zealand: one approach uses information handed down orally over the generations, the other studies the physical remains surviving from the past. Both have limitations and are beset with problems of interpretation. The two approaches are not necessarily mutually exclusive although most scholars have chosen to work with one or the other.

The volume of oral traditions collected and committed to written form is far from negligible (Skinner 1893; Downes 1909, 1915; Smith, S.P. 1910; McEwen 1986). The limitations of oral traditions as evidence about the past are now more widely appreciated (e.g. Simmons 1976; Vansina 1985; Belich 1996) than was the case when attempts were first made to translate oral traditions into straightforward narrative history in the late 19th century. A significant constraint for present purposes is that oral traditions usually have less to say about remoter periods and have been continually restructured through time to explain ever-changing contemporary situations. Sissons (1989) suggests that differences between early and late narrative traditions reflect a widespread re-organisation in Maori society which occurred in the mid 18th century. There is, however, nothing unusual about limited and unhelpful material: much historical writing is 'an attempt to provide a plausible narrative without overtaxing the evidence' (Davies 1993: 48; for similar comments see also Bartlett 1994; Fletcher 1998; Morley 1999). The question of what access our sources give us to the past is central to all historical enquiry. Arnold (2000: 12) notes that 'every historical account has gaps, problems, contradictions, areas of uncertainty'.

Information from non-archaeological sources is too complex to summarise briefly and discussion is largely confined to indicating the character of the evidence. There has been a recent tendency to regard the interpretation of oral traditions as the sole prerogative of the groups concerned, but this is neither a necessary nor sufficient condition for getting things right. Ideally, the archaeological remains and the oral traditions complement each other. In practice, the relationship is seldom unproblematic because of the limitations inherent in each.

1.3 PREVIOUS ARCHAEOLOGICAL RESEARCH

Moa-hunter sites and fortifications are the site types that have attracted most attention from archaeologists. The site at Waingongoro was prominent in the 19th-century debate over whether the moa remains and the occupation debris left by humans were contemporary (Anderson 1989: 97–99). The site was investigated by Rev. Richard Taylor in 1843 and by Walter Mantell in 1847. Later, in 1866, Governor Grey, Rev. Taylor, Lt. Col. McDonnell and others investigated ovens uncovered by wind. While the 19th-century argument over contemporaneity of humans and moa has been conclusively resolved in favour of synchronicity, the paucity of sites that are identifiably early is a major constraint on research into the earliest period of occupation. Rates of erosion around the coast in the last 150 years (Gibb 1978) and the changes at river mouths suggest the probability that an unknown number of sites at river mouths and on the coast have been lost. The relative lack of identified archaeological sites belonging to the early period of prehistory precludes detailed examination of a range of questions and issues that are of considerable significance. The idea of a widespread, but relatively sparse, settlement of New Zealand in the 14th century is, however, convincing, given that early sites have been identified in coastal areas in widely separated parts of the country.

Pa are very prominent in the archaeological landscape of some parts of the Taranaki–Wanganui region. Over 800 are recorded and yet others probably remain to be documented. As a result of archaeological surveys carried out over the last 40 years, a fairly clear idea of the nature and extent of settlement in the late prehistoric period has been developed. The location and extent of surveys is listed in Appendix 1 and shown in Figs 1–3. Appendix 2 contains details of archaeological excavations carried out in the Taranaki–Wanganui region since the late 1950s.

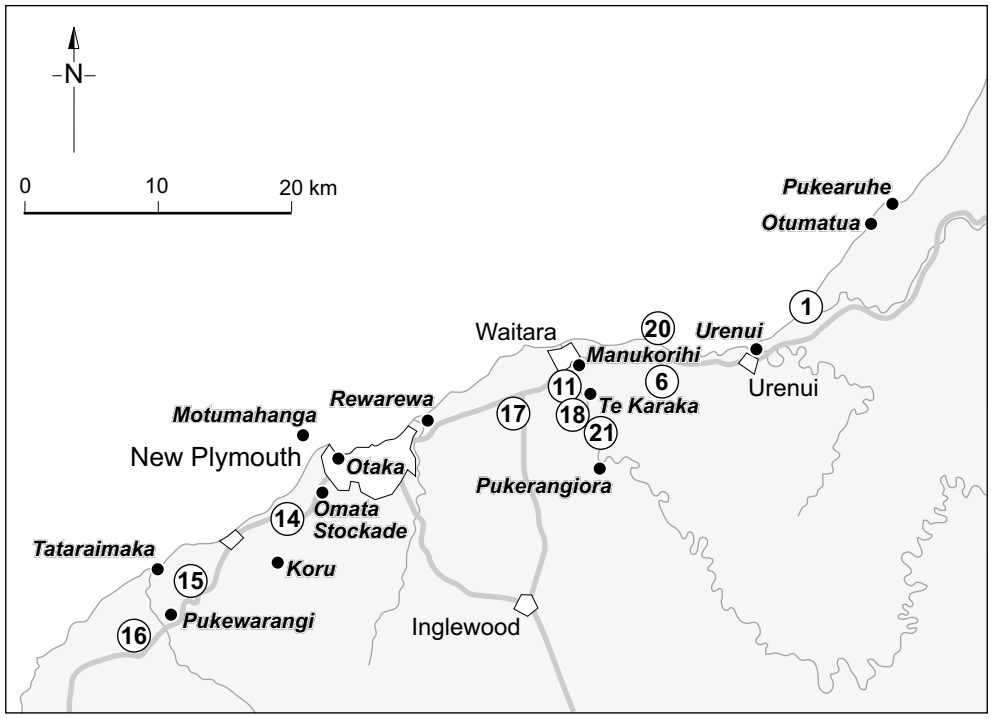

Figure 2. North Taranaki showing places mentioned in the text and the location of archaeological surveys.

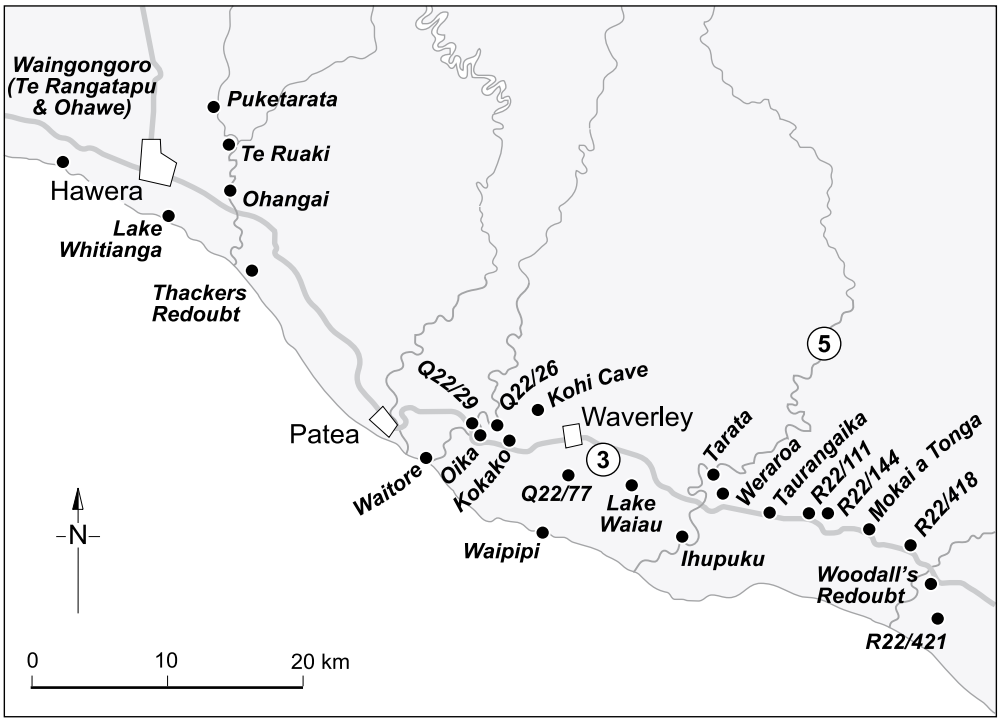

Figure 3. South Taranaki showing places mentioned in the text and the location of archaeological surveys.

Pa sites and pit sites are predominantly phenomena of the coastal lowlands (Figs 4–5). Within this area, however, there are significant differences in the archaeological landscape from area to area. Adds (1984: 104) reports that, in the early 1980s, pa made up 81% of recorded Maori sites in North Taranaki. He suggested that this figure is too high to be real and that it was due to the tendency to concentrate on pa and a concomitant neglect of relatively less visible classes of site. Further recording, however, has done little to change this pattern. In 1998, 394 pa make up 72% of recorded Maori sites in the same area. In a comparable area in South Taranaki a very different pattern is evident. Smart (1962) recorded 255 sites in the Nukumaru–Waitotara area but only 33 (13%) were pa. Pit sites, relatively rare in North Taranaki, were recorded in large numbers. Pits are a prominent feature of archaeological landscapes of South Taranaki but are not a feature of comparable areas in North Taranaki (Fig. 5). These differences require explanation and are discussed further below.

1.4 ENVIRONMENT

The Taranaki–Wanganui region has a number of different environmental zones, with very different potential for settlement in prehistoric times. There appear to be sound environmental reasons for the pattern of recorded sites as reflected in Figs 4–5. Gorbey (1970) confirmed the significance of the terrain and the type of soil in determining the distribution of pa. The pattern of recorded archaeological sites underlines the stark difference, in terms of their overall suitability for settlement, between the coastal lowlands and the hill country.

Archaeological sites recorded in Taranaki–Wanganui region and identified as of Maori origin are predominantly pa, or storage pits (including rua). These two

categories combined make up over 70% of the recorded sites. Most sites lie within about 5 km of the coast or near major rivers and relatively few sites have been recorded in Egmont National Park, in the inland hill country, or in the mountain ranges of the central North Island. Sites can be found anywhere, however, and there are some local concentrations even in the rough hill country remote from the coast. How much use was made of the marginal environments, and how people made a living from them, are little-explored topics.

The proximity of seasonal food resource areas played a major role in determining the location and longevity of settlements. Proximity to navigable rivers and streams and the access this provided to different resource zones were important throughout the prehistoric period. Well into the 19th century, it was

Figure 4. Distribution of pa recorded in the NZAA Site Recording Scheme.

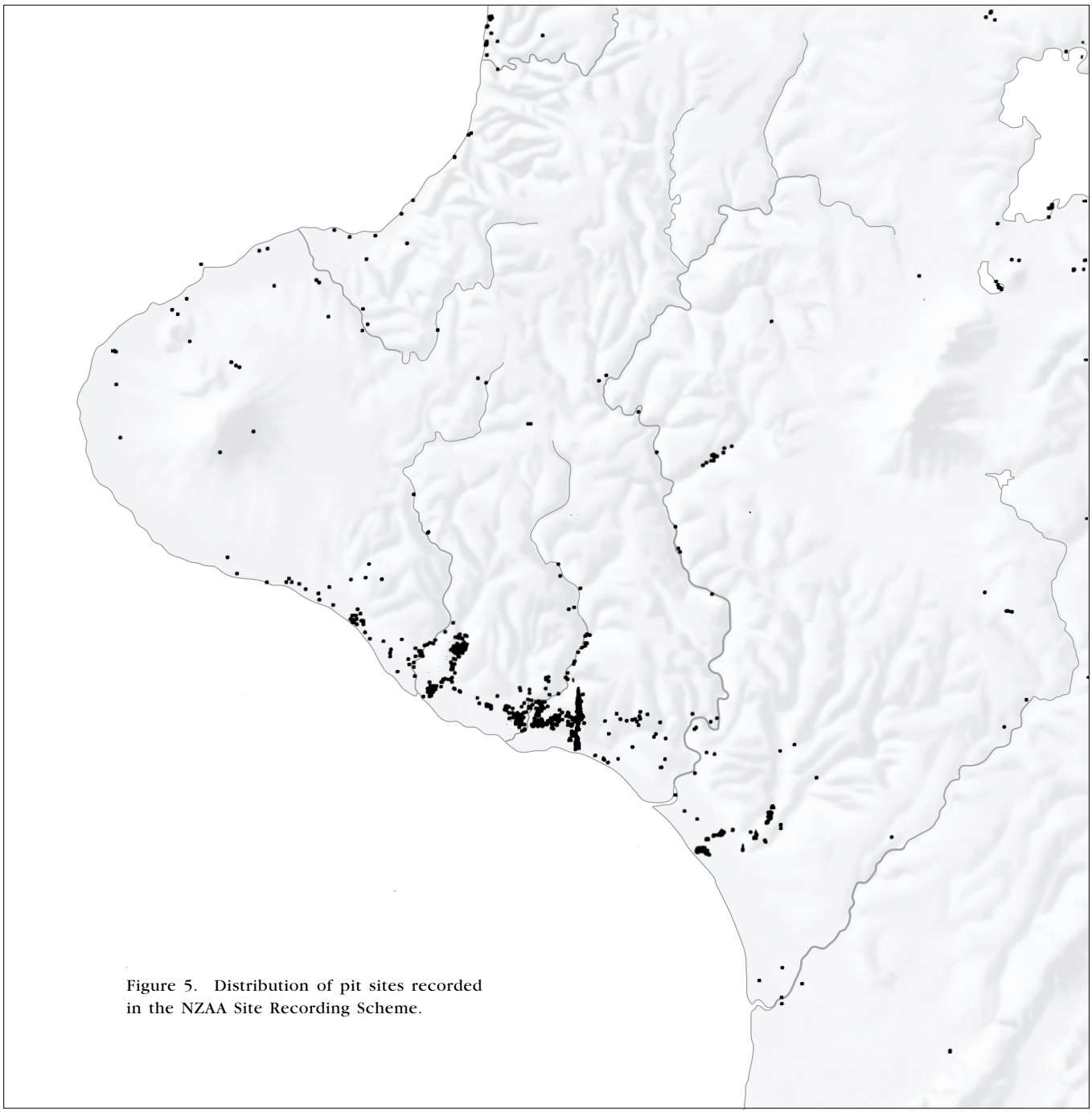

Figure 5. Distribution of pit sites recorded in the NZAA Site Recording Scheme.

usually easier to move about by water than travel by foot across country. As resources were often widely scattered, seasonal movement was characteristic of local subsistence patterns. The rivers gave access to the interior and facilitated access to different resources. Land routes were difficult and transport of food and materials was limited to loads that could be comfortably carried by unaided individuals. Most inland tracks, such as the long distance tracks of inland Taranaki, used ridgelines and followed the terrain.

Forest had been cleared from large areas of the coastal strip in Taranaki by the 1840s. The land was covered with fern but with sizeable patches of bush in valleys and other places (e.g. Dieffenbach (1843 v.1: 139–140) described the country between New Plymouth and Waimate). This created a mosaic pattern that increased access to the productive forest-edge zone. Plans published

between the 1840s and the 1880s indicate the approximate extent of pre-1840 clearance (e.g. General Survey Office map of Taranaki, New Zealand, dated 1879). Generally, the bush edge lay inland about 5–6 km but was further inland in some places. This clearance began, on current evidence, about 600 years ago.

The focus on the lowland coastal areas is, in large part, related to the importance of fishing and gardening as sources of food. The forest margins were also a significant source of fern root (*Pteridium esculentum*) and other resources. Most people probably lived within the strip of partly cleared land up to 6 km from the coast. Even when living some distance further inland up rivers, groups would come down to the coast to fish in summer, returning upriver with stocks of dried and smoked fish for winter consumption. Many of these fishing stations on the coast are much less visible than the earthworks of pa but they are an important part of the overall pattern of movement across the landscape to exploit seasonally abundant sources and provide stocks of food for winter consumption. The importance of fishing in the economy of groups living in the Whanganui River valley is documented in the historical period (Walton 1994).

Major changes have taken place in the environment within the last 800 years. Evidence of the introduction of kiore (*Rattus exulans*) about 2000 years ago (Holdaway 1996) may indicate transient human contact over a thousand years before permanent settlement occurred. The rats may have been responsible for extinction and range reduction amongst small fauna before human settlement. The most significant changes in the last 800 years have been the deforestation of large areas and the extinction of some species, particularly moa. The wide range of species present in early middens suggests that the hunters were opportunistic and took the largest animals they encountered. These human-induced changes took place against a background of fluctuations in climate which brought cooler or warmer summers in particular periods. Such variations in climate conditions would be significant if, for example, they affected the length of the growing season or created optimum conditions for burning the bush. Current evidence suggests, however, that mean temperatures probably did not fluctuate more than ±0.5° from the average during the last 1000 years (Royal Society of New Zealand 1990: 15).

New Zealand's position in the westerly wind belt determines the general character of the temperature and precipitation regimes but topographic relief causes marked spatial variability. When climate anomalies occur they tend to produce opposite effects either side of the main ranges so that conditions are colder and wetter in the west and warmer and drier in the east or vice versa. Information on past climate is derived from a number of different sources but none suggest significant changes in the last 1000 years. Glacial advances in the Central Southern Alps indicate periods of colder climate around AD 1200, 1400, 1600 and 1720. The largest of these was the 1400 advance. There were warmer temperatures around 1300, and in the 1300s and the 1500s (Royal Society of New Zealand 1990: 15). Few reconstructions of past climate based on tree-ring data exist for New Zealand but Salinger et al. (1994) reconstructing indices back to 1731 suggest that there were strong westerly flows from the 1730s until 1770 and that warm-season temperatures were cooler than usual in the 1760s and 1790s. Strong westerly flows suggest higher precipitation in western parts of the country such as the Taranaki–Wanganui region.

A period of widespread and sustained anthropogenic destruction of forest by fire after the period from about 650 to 560 years ago (NZA3433) is indicated by fine-resolution palynology of Erua Swamp, Tongariro (Horrocks & Ogden 1998). Radiocarbon dates and maximum ages of *Libocedrus* cohort trees indicate deforestation between about 570 and 550 years ago in the western part of Moawhango area and deforestation of Mangaohane Plateau about 430 years ago (Rogers 1987). High levels of *Pteridium* spores in the upper levels of Potaema bog and Ahukawakawa swamp on the northern and eastern flanks of Taranaki/Mt Egmont indicate clearance in the coastal lowlands after about 450 years ago (McGlone et al. 1988). This is unexpectedly late compared with the Central North Island area. In South Taranaki an abrupt decline in tree pollen and a dramatic increase in charcoal in the upper levels of Lake Waiau swamp deposits after 685 years ago (ANU6343 610±80 BP) also indicate deforestation, but the event is not closely dated (Bussell 1988).

Overall, these data are consistent with evidence of a widespread pattern of burning which occurred throughout New Zealand some 650–450 years ago (Anderson & McGlone 1992: 217–222; Newnham et al. 1998). It is important to stress, however, that large areas were not affected by burning and most of the Taranaki–Wanganui region, particularly the inland hill country, remained bush-clad well into the 19th or 20th centuries.

Volcanic activity on Taranaki/Mt Egmont also had an impact on areas around the volcano (McGlone et al. 1988). The major event within the period of human occupation occurred between AD 1500 and 1550 when hot avalanches of ash and lapilli crashed down the upper slopes and into river valleys. The loss of vegetation on the upper slopes followed by heavy rainfall led to deposition of large quantities of gravels in the catchment of streams like Stony River (Palmer et al. 1981:17). Further volcanic eruptions occurred in about 1655 and about 1755.

2. Resource use

2.1 MOA-HUNTING

Moa bones in coastal South Taranaki sites attracted early attention (Anderson 1989) and have continued to be a focus of research interest. Taranaki is 'the richest area of moa-hunting sites in the North Island' (Anderson 1989: 115). In all, moa have been identified at 11 sites in the Taranaki–Wanganui region (reviewed in Anderson 1989). Many of the sites have been subject to fossicking and formal scientific excavations have been limited in scope. The investigations have been hampered by the uncertainties in the definition of species of moa, the misidentification of remains, and radiocarbon dates which are the subject of debate. The result is that many sites are poorly documented and what evidence there is generally fails to produce a clear picture of the way of life of their inhabitants except in very general terms.

Reports have been published on work at Lake Whitianga (Q21/99) (Robinson 1961), Opua (P20/105) (Fyfe 1988b), Waingongoro or Ohawe (Q21/75) (Buist & Yaldwyn 1960; Buist 1960a, 1960b), Te Rangatapu (Q21/76) (Canavan 1960, 1962) and Kaupokonui (P21/3) (Buist 1962b, 1963; Robinson 1963; Cassels n.d.; Foley 1980). Moa bone has also been found at Hingaimotu (P20/120), in an occupation layer at a site on the upper Rangitikei River (Batley 1960), and in an occupation layer at the Moawhango Dam Cliff Shelter site (T20/1) (Newman 1988), but none of these occupations has been dated.

The small moa-hunting site of Foxton (S24/3) also lies within Taranaki–Wanganui region but is discussed in relation to environmental change in Manawatu–Horowhenua sand country by McFadgen (1997) and is only mentioned in passing here. The site is, however, extremely important for understanding the environmental and cultural history of the dune belt.

Nine species of moa have been identified from Taranaki–Wanganui sites (Anderson 1989: appendix C) namely: *Dinornis giganteus*, *Dinornis struthiodes*, *Dinornis novaezealandia*, *Dinornis torosus*, *Pachyornis mappini*, *Pachyornis elephantopus*, *Euryapteryx curtus*, *Euryapteryx geranoides* and *Anomalopteryx didiformes*. *Pachyornis mappini*, *Euryapteryx curtus*, and *Anomalopteryx didiformes* (which are all small species in the range 20–50 kg) are the most common. *Pachyornis mappini* and *Euryapteryx curtus* are North Island endemic species, but *Anomalopteryx didiformes* had a New Zealand-wide distribution (Worthy 1990). *Pachyornis elephantopus* and *Dinornis torosus* (when the latter is recognised as a separate species) are 100–170 kg endemic South Island species.

Pachyornis mappini was primarily a lowland species that preferred the forest edges and shrubland ecotones provided by wetlands. *Euryapteryx curtus* probably lived in lowland open forest or shrublands. *Euryapteryx curtus* is the most abundant species represented in Taranaki sites and some bones previously identified as *Pachyornis mappini* may in fact belong to this species (Worthy 1990: 223). *Anomalopteryx didiformes* preferred wet lowland, tall podocarp–broadleaf forests.

The period of moa hunting lasted from about 700 to about 450 years ago. This is based on a review of radiocarbon dates from across the country (McGlone et al. 1994: 145). Many of the Taranaki moa-hunter samples were dated prior to 1976 when the charcoal samples were unidentified as to species and the dated samples may, therefore, have substantial inbuilt ages. This is almost certainly the explanation for the 1463±52 BP determination (NZ0722) from Kaupokonui and the 1018±49 BP determination (NZ0543) from Waingongoro, which are too old by currently accepted views of the age of human settlement. Dates of 660±60 BP (NZ3934) and 610±50 BP (NZ3931) are now accepted as providing the most reliable dates for moa hunting at Kaupokonui (Foley 1980).

2.2 BIRDS OTHER THAN MOA

Prickett (1983b: 299) has commented that 'no sites yet investigated elsewhere in the North Island ... match the Taranaki sites for the array of extinct birds represented in such abundance' (see Prickett 1983b: table 1). The bones of 55 species of birds, other than moa, are represented at Kaupokonui. This includes the extinct swan, giant rail, goshawk, and crow. Weka, pigeon, kaka, kiwi, tui, duck, kokako, parakeets, and takahe are also present (Anderson 1989: 116). Buist (1962b: 235) has commented on the large numbers of forest birds in the midden at Ohawe. Later sites lack the rich variety of species found at early sites. The extinct New Zealand moor-hen, *Gallinula hodgeni*, usually grouped with moa and other flightless birds that became extinct early in the prehistoric sequence, has been reported from a late midden (S23/71) near Parewanui (Cassels et al. 1988).

According to historical ethnographic sources (for example, Taylor 1855: 380–382), birds such as kiwi, weka, kereru, and kaka were commonly taken. The inhabitants of Mangaehu (R20/39) in Inland Taranaki, took titi (muttonbird) in large numbers by knocking them out of the air as they flew over a steep precipice attracted by the light of a fire (Taylor 1855: 382; Mead 1966: 105). Hosking's excavations at Moawhango Dam cliff shelter (N122/1) uncovered evidence of taking of a range of species including the mottled petrel (*Pterodroma inexpectata*), but the hunting of birds in late prehistoric times has seldom left any durable traces, and so is rarely documented by archaeologists.

2.3 MARINE AND TERRESTRIAL ANIMALS

Early south Taranaki sites contain a variety of sea mammals, including fur seal (Te Rangatapu, Ohawe, Hingaimotu, and Opua), sea lions (Kaupokonui, Ohawe, Hingaimotu, and Opua), and elephant seals (Kaupokonui and Opua) (Smith 1989). The lack of similar remains from sites of later date is part of a broad pattern of absence over northern and central New Zealand.

Smith (1985, 1989) argues that human settlement and predation caused changes in the distribution of fur seal and sea lion populations. By the end of prehistory, fur seal and sea lion populations were common only in southern New Zealand.

Dogs and rats were both items of food throughout prehistory. Dog bone has been found at Kaupokonui, Ohawe, and Opua, and coprolites, identified by the excavators as dog, at Kaupokonui and Te Rangatapu. There are no comparable sites dating to later prehistory and so a decline in the importance of dog has been suggested. The change may, however, simply reflect different butchering behaviour in later prehistoric times. Rat has been found at Ohawe and a concentration of rat bones (Canavan 1960: 11) at Te Rangatapu.

2.4 FISH AND SHELLFISH

Fishing was a major source of food. According to historical ethnographic sources (e.g. Taylor 1855), the fresh water fisheries were based on the eel (*Anguilla* sp.), lamprey, and inanga. Weirs were built in rivers to take eel and lamprey, and channels were cut to take migrating eels. The salt-water fisheries concentrated on shark, snapper, kahawai and hapuku but anything taken was likely to be eaten. Kahawai, dog-fish and small shark were caught in large numbers and dried for later consumption at the Whanganui River mouth in the 1840s (Smart 1960; Walton 1994: 156). Dieffenbach (1843 v.1: 151) noted in December 1839 that the inhabitants of Ngamotu (New Plymouth) 'had daily gone out fishing, and the quantity of fish they took was so great, that they were enabled to dry large numbers in the sun for store.' Wakefield (1845 v.1: 252) noted 'a deserted fishing village' with 'racks and fish-bones' near the mouth of the Waitotara River in 1840. In spite of the volume of historical documentation attesting to the importance of fishing, limited evidence of this activity has been found archaeologically in the Taranaki–Wanganui area. Best found about 40 grooved net-sinkers near the mouth of the Waitara River in 1914 (Best 1918: 214) and they are still found along the Taranaki coast, particularly the Cape Egmont area (K. Day, Taranaki Museum, pers. comm. 2000). Buist (1976: 2–3) noted evidence of fishing camps in the coastal dunes at Waipipi including middens, ovens, flaked stone, and net-sinkers. Numbers of bone fish hooks from Puketapu pa (Q19/157) are held in the Taranaki Museum and the Whanganui Regional Museum. Many of these are small, suggesting a specialised function or catch (K. Day pers. comm. 2000). There is, nonetheless, a lack of detailed archaeological studies of fishing in this area and this gap in knowledge is likely to persist due to the scarcity of surviving sites. Fishbone is common at Kaupokonui, particularly in the later occupation (personal observations since 1974), but this aspect of subsistence practice has not been studied in the various excavations undertaken there.

The taking of eels and lampreys is better documented in historical ethnographic sources than in the archaeological record, but eel was present in some numbers at the Parewanui midden site (S23/71) and there are eel-trapping channels and a weir (S23/63) nearby (Cassels et al. 1988). Wakefield (1845 v.1: 252) noted a weir across the Waitotara River about 100 m from Ihupuku (R22/115) in 1840. Weirs were a feature of a number of the large rivers such as the Patea, Whanganui and Mangawhero, and their use persisted in some places into this century. There are some excellent photographs of them (see, for example, Young 1998: 187, 188).

Shell middens are rare compared with other areas of northern New Zealand such as the coastal eastern Bay of Plenty. This reflects relatively unfavourable conditions for shellfish along the coast at least as far south as the Rangitikei River mouth (Dr R. Wear, Victoria University of Wellington, pers. comm.). Middens are sometimes found on pa, but usually only as small deposits. The rarity of evidence, combined with little close examination of the contents of what middens there are, has ensured that many questions about diet and seasonality have not been addressed.

Isotope and trace element studies of human bone offer the best hope of determining the importance of marine foods to Maori communities in prehistoric times (Leach & Boocock 1993).

2.5 HORTICULTURE AND PLANT FOODS

It is often assumed that population size at the end of prehistory was closely related to the level of horticultural production. Greater reliance on cultivated foods was one way a population could increase its food supply. Kumara is frequently mentioned both as a crop and as a food in historical ethnographic sources and Taylor's observation (Journal 28 November 1844) that 'they take great pains in everything related to the kumara' is not unusual. Taylor's journals indicate that the planting of kumara took place from about mid October. This early start was necessary to make the most of the short growing season and to get the crops out of the ground by early April when the risk of frost increased. In this respect, lowland Taranaki–Wanganui has the advantage of enjoying some of the highest average number of days between last and first frost in the country.

Various attempts have been made to estimate the production levels of kumara in the prehistoric period. Yields achieved by subsistence cultivators in other parts of the world have been used as a guide to likely levels (Leach 1976: 154; Jones & Law 1987: 90). A figure at the lower end of the range is commonly adopted to reflect difficult climatic conditions, including a short growing season, and current understanding of the varieties in use. Although the importance of kumara in the diet has been questioned (Shawcross 1967; McGlone et al. 1994), yields from gardening must have justified the time and effort expended on it and there is archaeological evidence of denser populations in areas where kumara was grown. Two other crops cultivated in prehistory, taro and gourd, are seldom identified, directly or indirectly, in archaeological contexts and are also little mentioned in historical accounts. Wakefield (1845 v.1: 259) described crops of potatoes, maize, kumara, watermelons, gourds, and pumpkins 'in profusion' along the lower Whenuakura River in 1841, but both taro and gourd were not frequently grown, at least by the 1840s.

If horticultural production was generally low—perhaps between 2 and 5 tonnes/ha—evidence of horticultural endeavour is nonetheless common in the Taranaki–Wanganui region. This evidence takes a variety of forms. Storage pits are widespread (Fig. 5 shows pits in undefended sites only) and occur both as rectangular semi-subterranean structures and rua, the latter found in both cave and bell-shaped forms. These are generally assumed to be functionally

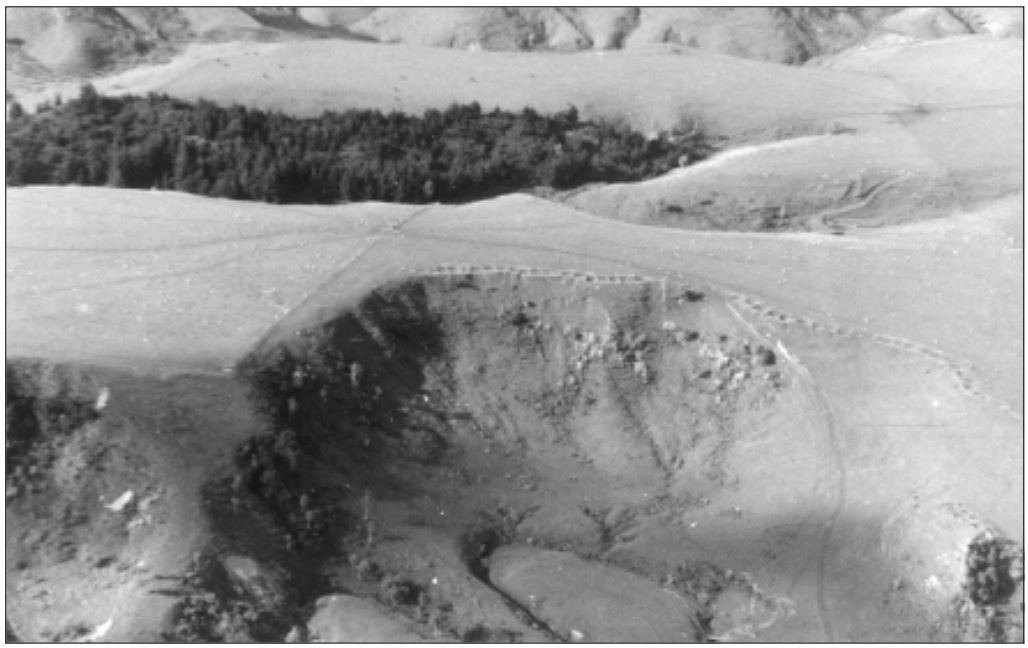

Figure 6. Pit site R22/421 in the early 1960s. Photographer: A.G. Buist. Whanganui Regional Museum Collection.

equivalent structures used for over-wintering kumara or potato stores, including the seed crop. Rua have advantages in settlements with confined space and were often built into the defensive banks of the site, thereby making good use of the limited space within the defended area. At Waimate (Q19/68) in 1834, Marshall (1836: 214) describes the rua as having 'trapdoors' that could safely be walked on and found that 'most were well-stocked, and several of them filled with potatoes for consumption.' In some of the pits were wooden bowls of water containing paua in the shell, dried and smoked fish, and gourds for water. This suggests that rua may have been used for storing a range of foodstuffs and supplies.

Reference has already been made to the prominence of pits as features in the archaeological landscapes of South Taranaki. An extraordinary site is R22/421 which contains some 37 pits end to end (with some gaps) on the edge of high ground (Fig. 6). Another, R22/418, contains at least 26 pits and R22/415 contains at least 23. These are the larger sites, but more common are the sites with a only handful of pits. The difference with North Taranaki requires explanation, as in many ways the soils and physical conditions are very similar. The key difference is likely to be scale. The coastal lowlands of North Taranaki are limited in size and are wedged in between the sea and the hill country. It is suggested below that society was very fragmented, with greater competition for resources, and that warfare was particularly prevalent in North Taranaki. This may have created a preference for storing produce on pa rather than in other locations. There are a number of pa at Motunui but, when soil was stripped from a large area in the vicinity for industrial development in the early 1980s, little evidence of occupation was found (Day & Adds 1981). A greater availability of land in South Taranaki may mean that the environment filled with people more slowly and that society was not as fragmented as in the north.

Figure 7. Borrow pits in the early 1960s, near Kokako Road. Pa Q22/26 is just out of view to the bottom right of photo. Photographer: A.G. Buist.

There is evidence of the use of sand as an addition to soils, presumably to provide better physical growing conditions for the kumara (Fleming 1953: 94–96; Walton 1984; Walton & Cassels 1992; Buist 1993). The soils modified were the best available locally, and it has been argued that 'made' soils were an attempt to enhance production on good soils rather than to bring poorer soils into production. Distribution of made soils is restricted to areas where there was a readily available supply of sand nearby (Fig. 7).

In North Taranaki Buist (1964: 24) has described large irregular pits in old sand dunes near Waiiti stream. A layer of coarse river sand sealed the earliest occupation at Kumara-kaiamo (Buist 1964: 25, 96) confirms a prehistoric antiquity for made soils, but otherwise there is little evidence to indicate the antiquity of this form of gardening in this region. Elsewhere in North Taranaki, coarse river sand has been reported in soils adjacent to Q19/11 near the Mimi River area (Buist 1964: 25; NZAA Site Record Form) and borrow pits and made soils have been identified at Matarikoriko (Walton 1984) and in the Waiongana River valley. Elsewhere, gardening has either left few identifiable traces in soil profiles, or the evidence has been obliterated by later ploughing.

The missionary Riemenschneider, who lived in the Warea district from 1846 to 1860, reported the use of stones as cultivation boundary markers (Day 1983a: 154). Smith, S.P. (1910: 113) saw garden boundaries made up of 'flat boulders set on edge and running in straight lines' in this same area in 1853. This type of evidence of gardening is unusual in the Taranaki–Wanganui area and no physical evidence has been found of these garden boundaries, probably due to destruction of the rows by ploughing (K. Day pers. comm. 2000).

With low yields from gardens, there must have been a heavy reliance on wild foods even in horticultural areas (McGlone et al. 1994). Historical ethnographic sources give some idea of the range of foods exploited. Wild foods were a major

Figure 8. Ihupuku Pa (R22/115) in the early 1960s. Note evidence of pits and later use as an urupa. The defences and areas outside the fenced urupa were levelled in 1986. Photographer: A.G. Buist.

item at hui held at settlements in South Taranaki and the Whanganui River valley in the 1840s and 1850s (see Walton 1994 for some Whanganui River examples). In March 1841 Rev. Creed found the inhabitants of Te Namu and Otumatua were absent harvesting karaka berries (Church 1991b: 40). Rev. Taylor noted that the inhabitants of Ihupuku (Fig. 8) had prepared eight canoes of dried kumara, two large stages of eels, and dried shark for a hui in 1846 (Mead 1966: 90). This last example highlights the importance of dried food as a means of storing seasonally abundant foods for later use. The process used for drying kumara is described by Taylor (Journals, 28 November 1844). He also reported that when the Taupo chief, Herekiekie, visited the lower Whanganui River he was presented with 40 kits of dried kumara and potatoes and that he stored them in a raised storage platform or whata (Taylor: Journals, 8 April 1846). The implications of storing part of the kumara crop in dried form is little discussed by archaeologists who have used storage capacity to calculate population size (Jones & Law 1987).

In summary, communities in Taranaki–Wanganui region lived by gardening and by hunting, fishing, and gathering wild foods. The relative importance of different foods would have varied according to the local environment.

2.6 STONE SOURCES

The region is deficient in the good fine-grained stone that was used for adzes. Imported stone types included metasomatised argillite, nephrite, and obsidian. For utilitarian implements that did not require a sharp cutting edge, such as pounders, lamps, sinkers, and grindstones, a range of locally obtained rock was available. Little has been published on these artefacts: the anthropomorphic 'Taranaki' pounder is an exception (Simmons 1971). Coarse crystalline rock