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RESEARCH STRATEGY

MAUAO HISTORIC RESERVE
ARCHAEOLOGICAL RESEARCH STRATEGY

InSitu Heritage Ltd

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Mauao Historic Reserve Archaeological Research Strategy

28 June 2022

Prepared for: Tauranga City Council and the Mauao Trust

Prepared by: s 7(2)(a) - Privacy

Contents

1. Purpose

Mauao Historic Reserve is one of the most significant cultural landscapes in the Bay of Plenty and New Zealand. The Reserve contains approximately one thousand visible archaeological features, which represent the remarkable continuity, concentration and complexity of human occupation in the area. Mauao is significant and iconic landmark for the Tauranga Moana community, and is visited by over one million people per annum. This volume presents opportunities for the dissemination of archaeological information, but also presents considerable challenges in terms of the management of the archaeological resource.

Tauranga City Council prepared a Management Plan for the Reserve in 2017 and a ten-year implementation plan (Te Mahere Whakamahinga o Mauao) in 2018. Both plans outline the desire for greater understanding of the Reserve through archaeological research. More specifically, management statement 5.1.2 j of the Management Plan has the stated goal of enabling "archaeological and other research to better understand the former settlement pattern and lifestyle of the ancestors who resided at Mauao. Encourage further archaeological research to identify and map unrecorded cultural and historic resources". Moreover, primary project F1 of Te Mahere Whakamahinga o Mauao outlines the potential management benefits of a greater understanding of the archaeological resource on Mauao.

This research strategy has been developed to fulfil the research goals laid out in the management plan. Its focus is on outlining the questions and methods underpinning the high-quality archaeological research programme. The communication of results and the involvement of tangata whenua in the research programme are regarded as essential. Although not within the direct scope of this document, these components are also discussed in brief.

2. Setting

The Mauao Historic Reserve is located at the western end of Mt Maunganui, Tauranga (Figure 1). Mauao and other nearby areas of high ground, such as Hopu Kiore and Moturiki, are remnants of rhyolitic lava flows. Initially islands, these formations gradually connected to the mainland through the development of the Mt Maunganui tombolo in the Quaternary period (Briggs et al. 1996; MacPherson et al. 2017). The Mt Maunganui and Bowentown tombolos, together with Matakana Island, form the seaward margins of Tauranga Harbour (Te Awanui). Tauranga Harbour is a large, predominantly shallow (<10m deep), estuary comprising two basins with intertidal flats making up around two-thirds of its total area (Inglis et al. 2008). The harbour supports a large range of species, many of which were important economic resources for Maori. Pipi (*Paphies australis*) – the most abundant shellfish species in Mauao midden – are found throughout the harbour, but are particularly concentrated in the south channel adjacent to the Reserve (Ellis et al. 2013). Elsewhere the harbour would have offered further access to faunal resources and various materials as well as providing a highway for people and goods to move (McFagden and Williams 1991).

3. Archaeological Background

The urban and industrial development of Mt Maunganui has created 'islands' of Mauao and other un-developed areas, such as Hopu Kiore. In fact, these places were integral parts of a broader cultural landscape at Mt Maunganui and, more broadly, Tauranga Harbour (Phillips 2003). The following sections provide an overview of the archaeology of Mt Maunganui, discussion of Mauao draws directly from a comprehensive report produced by Ken Phillips (Phillips 2003).

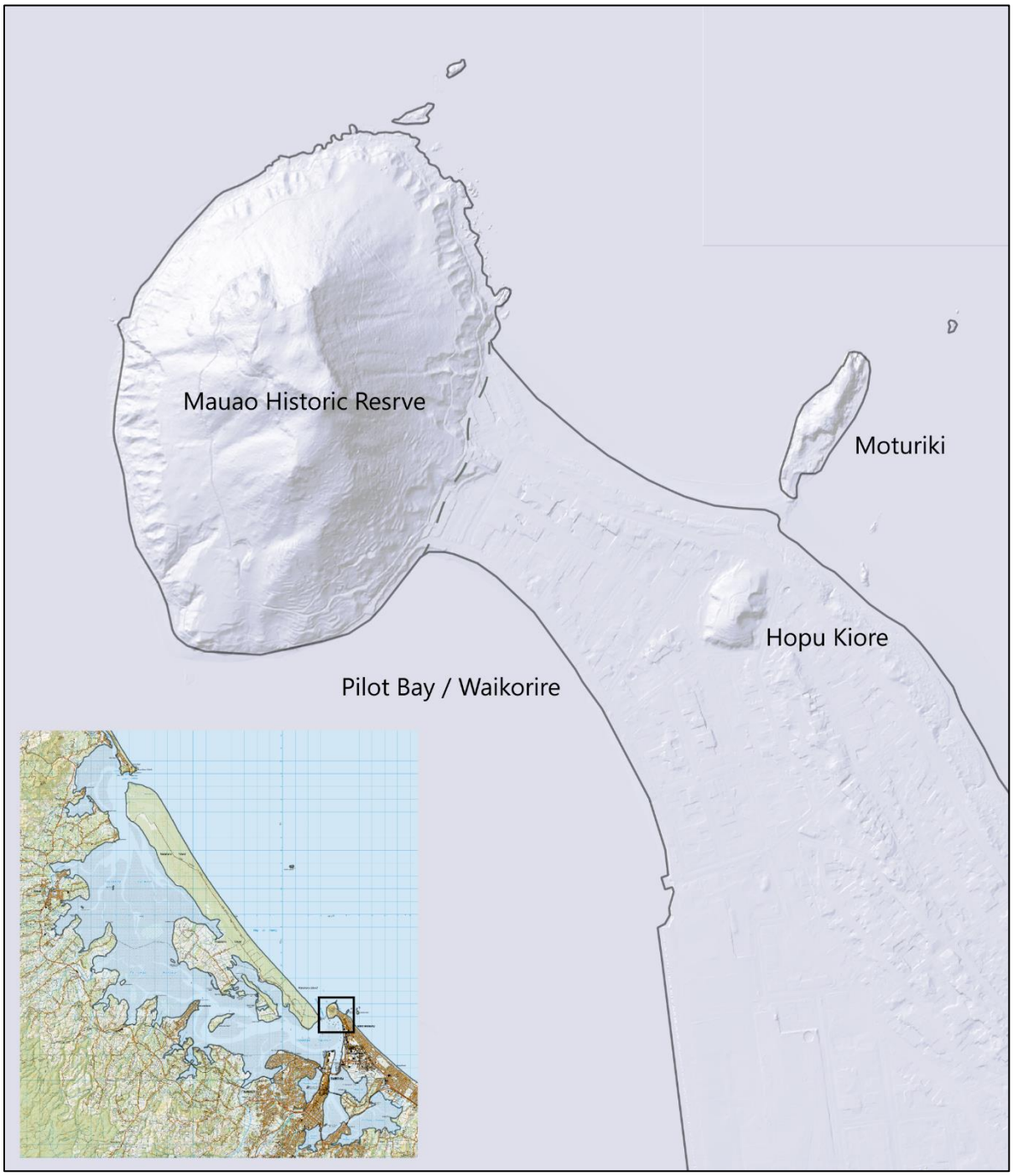

Figure 1 – The location of Mauao Historic Reserve and surrounding areas.

Initial settlement of Mt Maunganui landscape occurred at Waikorire/Pilot Bay and dates from the earliest period of Polynesian occupation in New Zealand. The Waikorire site (U14/363) was originally identified as a result of erosion of the Waikorire beach frontage from the late 1960s. In the record of the site submitted to the New Zealand Archaeological Association Site Recording Scheme, s 7(2)(a) - Privacy noted the presence of vast amounts of stone, including obsidian and Tahanga basalt, various tool types, and midden containing shellfish, fish and moa bone.

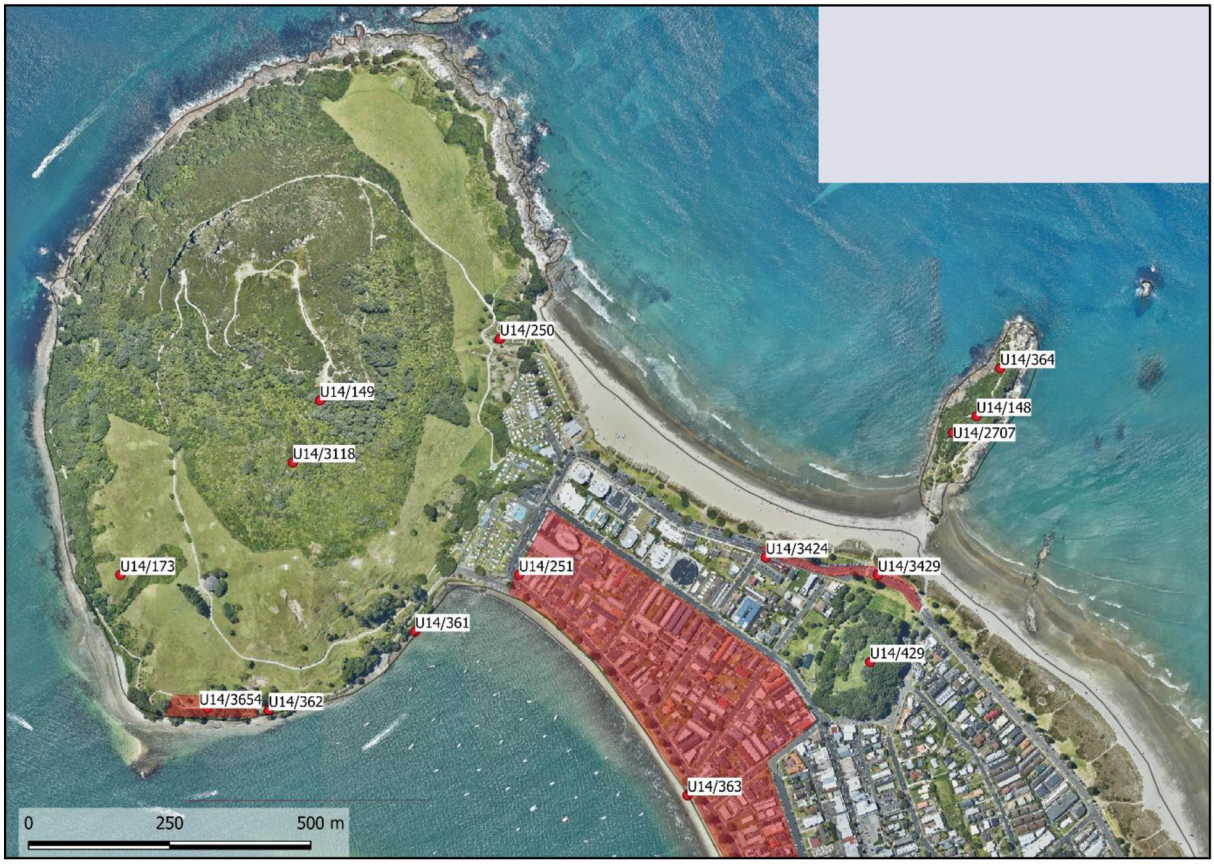

Figure 2 – Archaeological sites in the Mauao Historic Reserve and adjacent areas,

This material was found both eroded on the beach and in association with in situ occupation layers in the beach face. These layers have subsequently been identified in a number of investigations on The Mall, the adjacent beach reserve and in isolated areas further inland (Mallows and Cable 2006, Mallows 2007, Phillips 2009, Hooker 2010, Phillips and McCaffrey 2013 and Holmes et al. 2014). In most cases the reported stratigraphic sequence includes a lower, charcoal stained layer containing artefacts and faunal material consistent with early occupation and an upper layer consisting predominantly of shell midden.

The lower layer commonly contains moa bone and artefacts – particularly fishing gear and adzes – typical of the early period occupation (Mallows 2007, Hooker 2010, Phillips 2009, Phillips and McCaffrey 2013). Moreover, Hooker (2010) notes the presence of the early layer immediately atop a Kaharoa ash deposit, dated to approximately AD 1314. Direct radiocarbon dates of the early layer also firmly place the occupation in the initial 100 years of Polynesian settlement of New Zealand (Mallows 2007, Hooker 2010, Holmes et al. 2014).

Evidence from Waikorire is consistent with many other sites of this era. The site appears optimally positioned for the exploitation of local resources, such as fish, shellfish and other estuarine and marine species. Fresh water was also available from springs on the nearby southern slopes of Mauao. The settlers of Waikorire were also connected to a broader regional economy as evidenced by the presence of large amounts of stone from the Coromandel and perhaps some from Motutapu Island in the Hauraki Gulf (Holmes et al. 2014). While the clearest evidence from early period sites relates to subsistence activities, gardening was also a core part of the early economy (Walter et al. 2006; Prebble et al. 2019). While the immediate dune environment was unsuitable for crops, soils on Mauao were capable of supporting Polynesian gardens (Phillips 2003), which, together with the springs, may have drawn early occupants into the confines of the present Mauao Historic Reserve.

Later Settlement

Investigations on the tombolo have also identified later occupation layers. Typically, these layers are shell-rich, and contain a smaller range of species compared to earlier midden. Radiocarbon dates from a range of locations across the Mt Maunganui dune environment have provided dates for the later layers from the 15th to 19th century (e.g. Holmes et al. 2014). Shell mounds, similar to those found on Mauao today, were also formerly found near the present location of the camp and in Waikorire (Phillips 2009).

> "These industrial scale shellfish processing areas probably relate to this late prehistoric and early historic period (ca AD1600 - 1830s) when shell fish became a significant protein source for local consumption, preservation and trade. s 7(2)(a) - Privacy also recorded and investigated a number of large shell mounds at Pilot Bay and noted changes in species concentrations through time and an almost complete lack of artefact material within these deposits. The shell mounds of Pilot Bay appear to have been similar in structure to those still visible on the western slope of Mauao which exhibit a number of unusual features. Unlike many coastal Bay of Plenty middens the shell mounds at Mount Maunganui are remarkably concentrated and discrete and do not extend beyond the mound structure. While sand layers indicate short periods of inactivity between deposition episodes, they typically represent uninterrupted and prolonged use. The distribution of these midden mounds within the Pilot Bay landscape and on the slopes of Mauao suggests a degree of social and spatial organisation unique to this area." (Phillips 2009:40)

The most visible archaeological features in the Mt Maunganui area are found on the high ground within the Mt Drury (Hopu Kiore) and Mauao Historic Reserves. These features include, terraces, pits, house-floors, large midden mounds and defences. Although they have not been directly dated, such features are commonly considered to be predominantly post c. AD 1500 (e.g. pa - Schmidt 1996) or 'late' in the New Zealand pre-contact sequence.

The features on Mauao have been extensively mapped by Phillips (2003) and In Situ Heritage. Phillips (2003) provides a detailed account of these features grouped according to their geographic position (Figure 3); a version of Phillips' discussion is provided below with minor edits to remove some details not relevant to the current document.

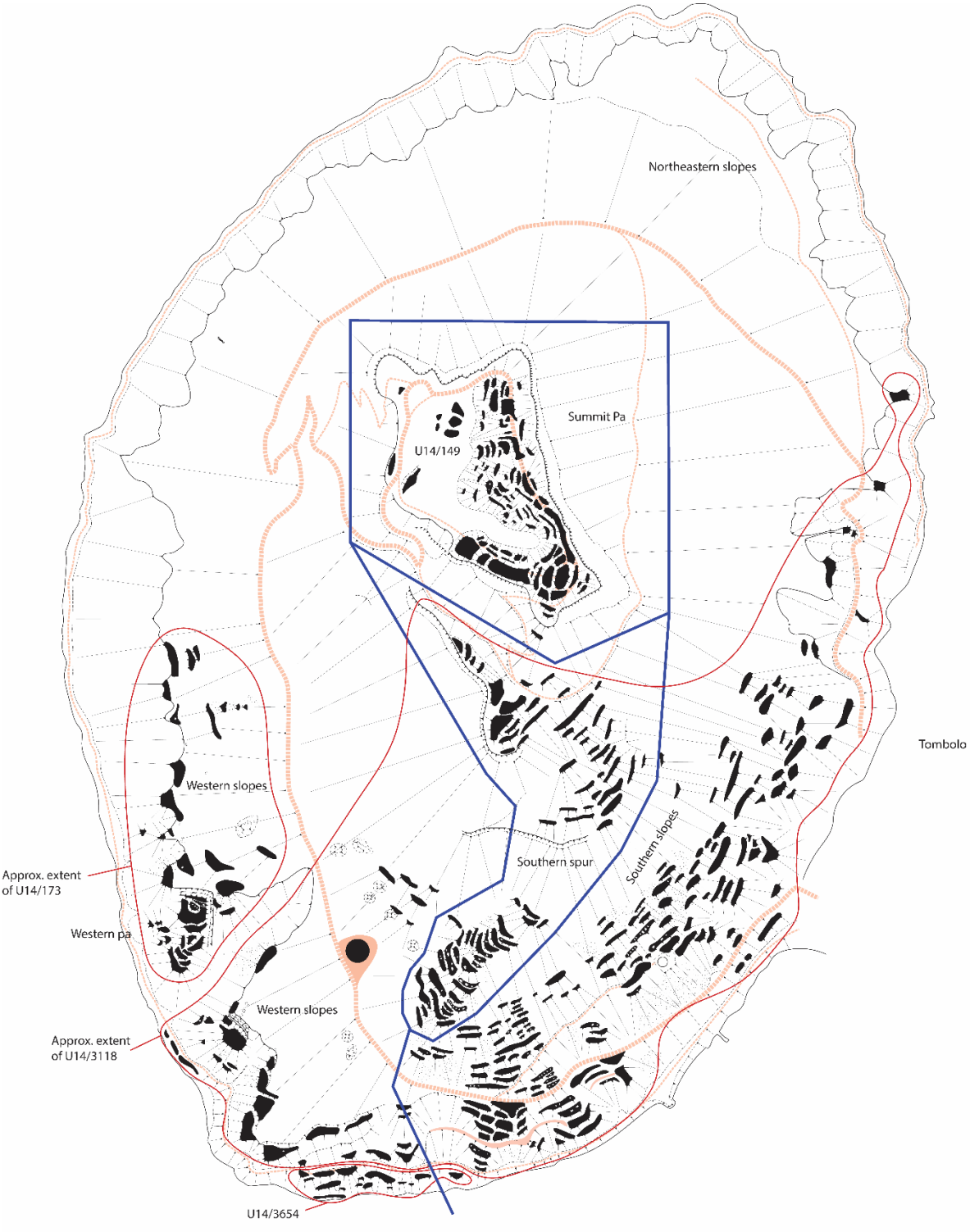

Figure 3 – Archaeological features and sites in the Mauao Historic Reserve, Phillips' zones (e.g. southern spur) are also noted.

The Summit Pa

The summit pa, also referred to as 'Ranginui's Pa', was one of the most strategically important locations in the Tauranga District with commanding

views along much of the Bay of Plenty coast and inland to the volcanic plateau.

The summit is relatively flat comprising two low ridges branching north and north west from a central high point. The two ridges are separated by a sheltered 'amphitheatre like' basin. The summit ridges are terraced while the

basin contains a series of long low back scarps creating large open terrace and platform areas. The summit is naturally defended on three sides by rocky bluffs and steep talus slopes while a 10-20 metre scarp on the southern approach was probably strengthened by palisades.

A number of terraces on the summit have stone-faced risers above and/or below the terrace tread. Equally common are terraces with a boulders forming a barrier at each end. While stone faced terraces are relatively rare in the Bay of Plenty their presence on Mauao is not surprising given that stones and boulders form a significant part of the landscape. The summit proper was the probable location of the tihi now occupied by a trig and reserve furniture.

Many of the archaeological features of the summit Pa had been covered by scrub and mature pines since the mid-1920s until vegetation clearance was carried out by tangata whenua in the late 1960s. Soon after the vegetation removal s 7(2)(a) - Privacy ' (archaeologist) inspected the pa during a Tauranga Historical Society outing.

According to a report of the visit archaeological features identified by s 7(2)(a) - Priva included 'a fire place consisting of stones set on edge, large look-out rocks which also had deep grooves where the edges of adzes had been sharpened, a large flat rock where tools had been sharpened on their flat faces, boundary stones set on edge in straight lines, a water collecting area, large vertical kumara pits (rua Kumara), cooking ovens (umu), house sites, sites of palisading, and rock· and earth banks supporting house sites.

Notes taken during subsequent visits by s 7(2)(a) - Privacy identify many more subtle surface features including hearths and midden scatters. Despite recent fire damage many of these features remain hidden by low vegetation and for security reasons many are not presented in this report.

The archaeological integrity of many features on the summit has suffered significantly from track construction, pedestrian traffic, installation of reserve furniture and vegetation management. The summit desperately needs a management plan established by experts in the field of archaeological site conservation.

The Western Pa

Above the western coastal escarpment are two defended areas on either side of a spring gully. The northern defended area referred to in this report as 'the western pa', is often called Kinonui's Pa, however, its association with Kinonui's exploits on Mauao is unclear. It comprises a spur descending to the southwest defended by ditch and bank earthworks on the northern and eastern sides.

The elevated northern platform (tihi) encompasses four house floors overlooking a flight of nine or ten terraces descending to the south. Extensive shell middens extend below the southern-most terraces.

The antiquity of the western pa has not been determined although some believe it to be of a later construction due to the type of ring ditch defensive system. However, the antiquity of the ring ditch defensive system has yet to be conclusively established.

The Southern Spur

Terracing extends from the summit pa down the southern spur to Waikorire. The continuity of the archaeological landscape from the summit to the harbour shore is not currently apparent due to vegetation cover on the upper half of the southern spur. The vegetation cover has also resulted in a perceived discrete division of the archaeological landscape between the summit and the lower slopes that has influenced previous management plans.

Archaeological features on the upper half of the spur are similar in concentration and function to features clearly defined in pasture on the lower slopes. There are numerous rua, evidenced by many circular depressions, particularly on the large level section of the spur immediately south of the summit.

At least two artificially steepened scarps divide the upper reaches of the southern spur and may have been the location of palisade lines defending populations on the summit from the relatively easy approach up the spur from the south. Further stone-faced terraces are located mid-way down the spur as well as terraces containing multiple crop storage pits and house floors.

The Southern Slopes

Occupation terraces cover almost all of the lower slopes of the south eastern quarter of Mauao east of the Waipatukakahu Spring making this area one of the most populated parts of prehistoric Mauao. This activity area would have spilled out onto the Pilot Reserve spur and along the frontal dunes of the ocean and harbour beaches. Early 19th and 2011 century accounts of the tombolo landscape indicate large shell midden mounds dotted the area now occupied by the Motor Camp and residential development to the east.

The size and complexity of the terrace complex on the southern slopes is unique in the Bay of Plenty and represents a high degree of spatial organisation. Many terraces contain one or more storage pits as well as possible house floors and the presence or absence of midden below the terraces often indicating function. In several areas' middens extend onto the tread of occupation terraces and larger middens may have completely buried and preserved earlier occupation terraces.

The intensity and complexity of the terrace complex on the southern slopes makes this area one of the most archaeologically significant on Mauao. The

burial of earlier terraces by later midden deposits presents archaeology that may provide information relating to occupation phases on Mauao and the changing function of terrace features.

The Western Slopes

The lower western slopes have a unique archaeological feature distribution pattern with large areas left relatively free of earthwork or midden features. Terracing is confined to the edge of the coastal scarp leaving common ground above. It was initially thought that these open areas were used for the cultivation of crops, however, an examination of soil profiles revealed a relatively unmodified soil stratigraphy with no evidence of mixing of soil horizons typical of Maori cultivated soils in the Tauranga District.

It is equally likely that these open spaces functioned as communal gathering areas or Marae. Around the margins of the southern end of this open area are five or six of the largest terraces on Mauao, including one that is defended by a transverse ditch and bank. The latter terrace is considered by many to be the location of Kinonui's large meeting house said to have been above Stony Point (Te Kaawa) and capable of holding 150 or more people, It was within this meeting house that Kinonui and Kotorerua engaged for several hours in 'courtly urbanity and matchless dissimulation covering a substratum of deadly hate' before Kotorerua went outside and torched it incinerating Kinonui and his associates.

The open slopes to the north of the western pa (currently in pasture) are partially divided by large shell midden mounds several metres in depth. These mounds are quite different from middens found in association with the occupation terraces overlooking Waikorire to the east. They are not associated with occupation terraces and are neatly constructed with little or no scatter beyond the mound. Their association with the open ground may suggest they were processing areas for important occasions when large quantities of food were prepared.

The Northeastern Slopes

An apparent absence of archaeological features on the north eastern slopes may be somewhat deceiving. The dense sward of kikuyu currently covering this area prevented accurate archaeological inspection, however, the absence of clear earthwork features such as occupation terraces and pits on such favourable contour is intriguing.

One possible reason for the lack of occupation features is the high concentration of boulders and cobbles that litter the slopes. In addition the unstable nature of the rocky bluffs above this area may have presented a dangerous environment for permanent occupation.

The hazards of living below rock outcrops on Mauao are conveyed in a story about Tamapahore following the battle of Kakowai. Tamapahore is said to have selected a place to settle within Maunganui Pa, however, the other

Ngaiterangi rolled great stones down the hill to his location; he took the hint and made a pa elsewhere at Maungatapu.

While permanent occupation may have been too hazardous, cultivation of crops could have been the primary function of the eastern slopes. There are indistinct small narrow terrace-like features with sloping treads that may be interpreted as cultivation terraces, however, the key to understanding the function of this area is probably in the soil stratigraphy. Preliminary examination of exposed soil profiles indicates deep topsoil with possible mixing of soil horizons suggesting this area may indeed have been used for crop cultivation.

In similar rocky landscapes throughout New Zealand early Maori cultivation often involved the clearing of rocks and cobbles to create defined garden areas. This often resulted in distinct stone alignments or mounds surrounding these gardens. There is no evidence of rock clearance on the eastern slopes, however, there are areas close to the coastal scarp that are relatively free of surface boulders.

The archaeology of the eastern slopes remains poorly understood, however, given the large prehistoric population inhabiting the many occupation terraces to the west it is reasonable to assume that the favourable contour of the eastern slopes formed an integral part of the archaeological / cultural landscape on Mauao.

Maunganui Pa -'the Super Pa'

Maunganui Pa essentially encompasses the entire archaeological landscape on Mauao although many features are not contemporaneous with the Maunganui Pa occupation phase.

s 7(2)(a) - Priva description of the settlement on Mauao at the time of the battle of Kokowai (variously dated by secondary sources between 1625 and 1750) correlates well with the surviving archaeological landscape. Wilson writes, 'The pa of Maunganui... covered about 100 acres. The fortifications crossed the top of the hill and ran down each side, then, circling round the base towards the south, they met.... The fortifications were so strong and the garrison so numerous that the pa seemed impregnable to Maori weapons...

Stafford writes that Maunganui Pa must have presented one of the most heavily defended positions in New Zealand.

That such a large area could be successfully defended seems quite remarkable, however, an inspection of the topography and archaeological feature distribution provides evidence of the existence of this super pa. Visible archaeological features on the southern side of Mauao terminate relatively abruptly at two points on the eastern and western sides. The western boundary is defined by a gully extending from the rocky shore up the talus slopes to a section of near vertical slope angle. The defining archaeological features on the southern inner edge of this gully are a row of large shell mounds cleating an elevated inner bank. Few archaeological features are

found north of this gully where the gently sloping ground changes rapidly to steep terrain.

On the eastern side a series of prominent gullies extend from the western end of Ocean Beach up to the Waikorire walking track above which the talus slopes present an extremely difficult climb, particularly when without vegetation cover. Archaeological features finish abruptly just south of the first gully with several platforms evident on either side of the most clearly defined central gully. The central gully extends up to a vertical rock face just below the Waikorire track.

The eastern and western gullies would have provided excellent natural barriers and with palisades would have presented a formidable barrier to would be attackers.

The defensive line probably employed a combination of earthwork and timber barriers on the lower slopes and naturally steep terrain and rocky bluffs on the upper reaches below the summit. The steep weathered coastal scarps around the southern shore also provided a natural barrier that when enhanced with palisades would have been an equally effective deterrent.

The enormous scale of Maunganui pa would have required an exceptional degree of social and political organisation in its construction, maintenance and defence. The use of space within the pa, evidenced by the distribution and function of archaeological features, reflects this degree of organisation making Maunganui one of the most remarkable pa in New Zealand.

4. Research Aims

The current state of archaeological knowledge on Mauao is limited to what is evident from the visible features in the Reserve. Bay of Plenty archaeology is remarkable for the large amount of sub-terranean features, which are not visible on the surface. Thus, the present archaeological picture of the Reserve is incomplete and coarse-grained. The overall aim of this research is to enhance the understanding archaeological features and address unresolved questions about the traditional occupation and use of the Reserve. This will advance the archaeological understanding of the Reserve, but will also have positive management outcomes. This aim will be addressed via the research themes and smaller-scale research questions outlined below.

Nature of Archaeology

While there are a large number of visible features in the Reserve, further research is required to understand these features more fully and to relate them to any not visible on the surface. The key goal of this strand of research is to better understand the occupation and use of different areas of the Reserve as well as how these have changed over time.

The Reserve contains one of the most significant terrace complexes in New Zealand. While excavation of analogous features elsewhere in New Zealand provide some sense of what these features were used for (e.g. occupation), no such evidence currently exists for features in the Mauao Historic Reserve. Targeted excavation of terrace features will provide a clear picture of how features were occupied and used. Comparison of results from different areas within the

Reserve (e.g. terraces on the southern spur v. the western slope) will provide evidence of any spatial differentiation. Finally, targeting of those areas where features appear to overlap (e.g. midden overlying terraces; Phillips 2003) provides an opportunity to investigate temporal changes within these areas. The key tasks that will be undertaken to address this goal are as follows:

- Drone survey of selected areas to capture a 3D model of features prior to any archaeological investigation.
- Excavation of a small areas in different parts of the terrace complex to identify features such as postholes, hearths and pits, which provide evidence of the type of occupation.
- Excavation of areas of the terrace complex in order to establish relative chronology and change through time in use and occupation of features
- These first objectives will be supported by the radiocarbon dating programme (below).

There are at least two areas in the Reserve where visible surface features are conspicuous by their absence. The first is located in an area of dense archaeological features on the western slopes of the maunga (Figure 4). Two hypotheses have been presented to explain this 'blank' area.

The first is that it was used for gardening. The soils on the western slope of Mauao are suitable for Polynesian cultigens (Phillips 2003) although soil profiles observed by Phillips suggest limited cultural modification consistent with gardening in the area. The position and extent of these profiles is not discussed by Phillips, and further testing of this hypothesis is required. The alternative hypothesis is that this area represents a marae space (Phillips 2003). Both oral tradition and visible archaeological features suggest this area housed large and important structures that may well have been associated with such a marae space. Like the previous hypothesis, further work is required to confirm this idea.

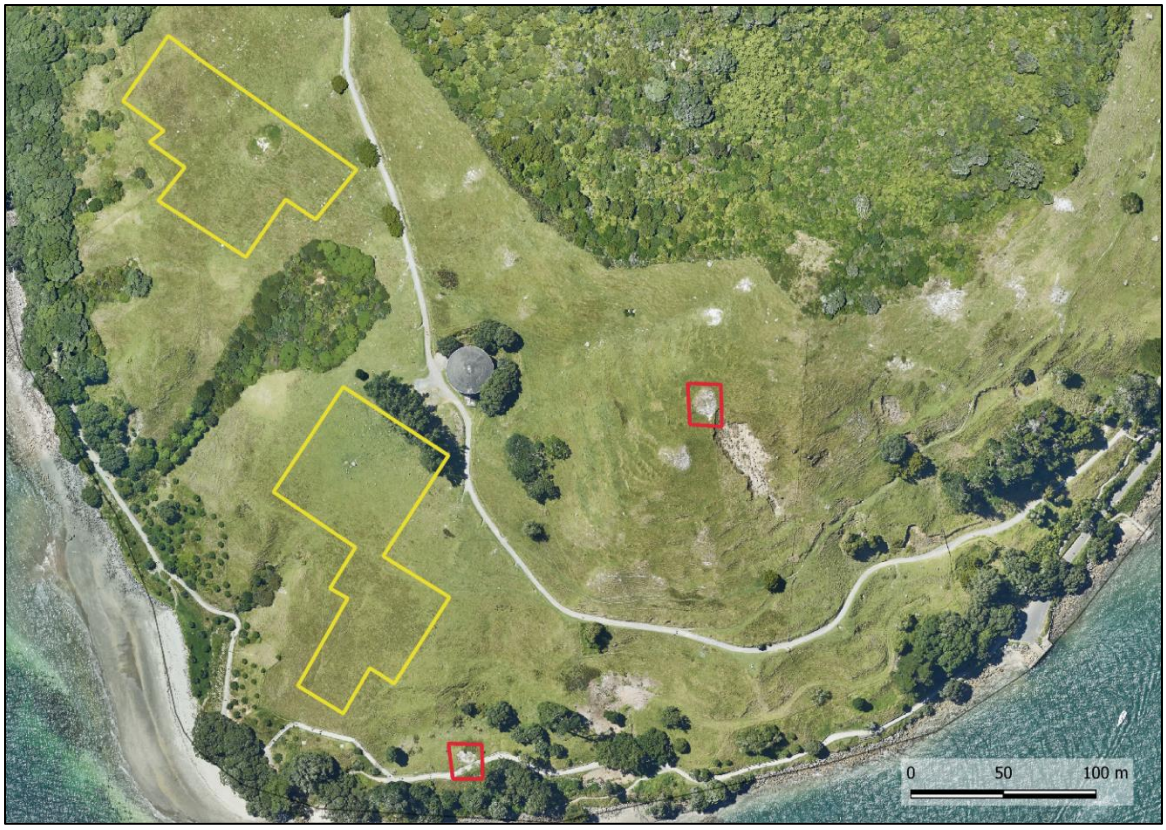

Figure 4 – Potential geophysical survey grids (yellow) within 'blank' areas on the western slopes of Mauao. Shell mounds that are at risk from erosion and could be investigated shown in red.

The second area where no visible archaeological features are present is in the northeast of the Reserve, beneath the debris field (Figure 5). The area is suitable for horticulture, which may account for the absence of features, but it is also possible that the relatively exposed nature of the area, together with danger caused by rock debris may have prohibited settlement in this area.

- Geophysical survey of 'open' areas to determine the existence of features.
- Targeted excavation to test the results of this survey as they relate to the competing hypotheses for this area.
- Environmental analysis on soil samples from 'open' areas to test for evidence of gardening.

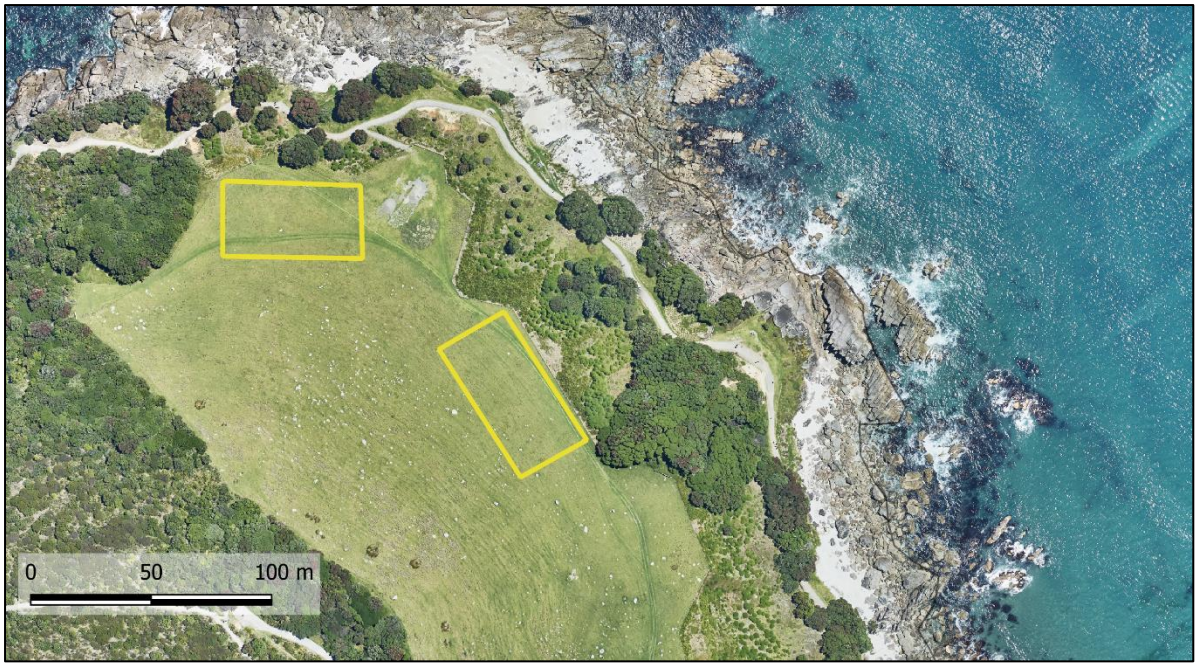

Figure 5 - Potential geophysical survey grids (yellow) within 'blank' areas on the northeastern slopes of Mauao

Subsistence and Specialisation

Midden are the most common archaeological sites in New Zealand, although there is considerable variation within this category. Many early midden contain evidence of broad-spectrum foraging from a variety of habitats. For instance, a midden deposit from Wairau Bar near Blenheim contains evidence of over 40 different bird species (many extinct) from marine and forest environments, as well as shellfish, fish and marine mammals (Jacomb et al. 2014). Smaller-scale early sites in the North Island do not possess the same species range, but do show evidence of diverse foraging practices, particularly in relation to many later midden, which tend to have a narrower species range. While there is some diversity in the content of midden in the Reserve, the majority are dominated by pipi (*Paphies australis*) suggesting a somewhat later date. However, the more interesting aspect of midden in the Reserve is their form; there are a series of midden mounds both in association with terraces and as stand along discrete features. These features offer an opportunity to better understand the subsistence practices of communities living at Mauao, including confirming that the mounds are the result of mass-harvest. They also offer the opportunity to investigate the impact of early communities on shellfish resources.

- Excavation in two areas – one mound and one shell dump off the edge of a terrace
- Retention of baulk for recorded layers and for selection of c14 dates
- Dating shells at key points to establish sequence
- Faunal analysis of column samples to determine species change and size variation

Chronology

The generic chronological model of New Zealand suggests many features within the Reserve belong to the 'late' pre-contact period (c. AD 1500 – 1769). However, radiocarbon dates from the Mt Maunganui tombolo suggest the area was occupied at points throughout the pre-contact

sequence. Moreover, Phillips (2003, 2009) suggests the suitability of the lower slopes of Mauao for horticulture and their proximity to a known early settlement at Waikorire are reasons that earlier settlement of the Reserve is likely. No direct dates are currently available from the Reserve, meaning that neither a more accurate date for later features, or the possibility of earlier settlement within the Reserve can be explored. This research will refine the chronological picture of the Reserve and, in so doing, investigate the possibility of early settlement. This will be achieved through the following steps:

- Excavation of selected features to understand relative age of features
- Collection of radiocarbon dates for key sites in the Reserve
- Acquire dates from different points in the stratigraphic sequence of shell mounds

Relationship to Local and National Questions

The proposed research focusses on contributing to outstanding questions on both a local and national scale. The key goal of this research is to provide a richer picture of the lifestyle of tupuna who lived on and near Mauao. In so doing the research will also provide information that will contribute to and guide future management of the Reserve.

The research will also contribute to broader archaeological questions. There are three key areas where the proposed research will have impact:

- Early Settlement in the North Island – Current models of the early period of New Zealand human history are drawn heavily from South Island data. While much in these models is applicable to the North Island, there are also key areas – most notably the horticultural nature of early settlement in the north – that require modification of existing models through the addition of new data. Current archaeological data shows the Mt Maunganui tombolo was occupied to some degree across much of the pre-contact sequence. Thus, the Mauao landscape presents an interesting opportunity to develop bespoke models of Polynesian settlement that can also be applied on a wider scale.
- Change Over Time – Current archaeological data shows the Mt Maunganui tombolo was occupied to some degree across much of the pre-contact sequence. Thus, Mauao offers the opportunity to understand the timing and change in lifeways.
- From Generalists to Specialist – Early occupation sites typically have a broad-spectrum foraging, but there is potential evidence on Mauao that points to specialist harvesting of shellfish. Thus, we have the opportunity to understand the timing and nature of subsistence change and human impacts on the Tauranga Harbour.

5. Methodology

In order to gain the necessary archaeological information to address the aims outlined above the following field and laboratory methods will be used.

All investigations will comply with the requirements of the Heritage New Zealand Pouhere Taonga Act and will be subject to Heritage New Zealand, Nga Poutiriao o Mauao and Tauranga City Council approvals.

Excavation

Hand excavation will be carried out in targeted areas within the Reserve. Excavation units will be sited to most effectively address the questions of this research; these decisions will be informed by previous mapping, visible features and geophysical survey. Where possible excavation will be carried out on features under direct threat from factors such as erosion. Excavation will be carried out using standard archaeological techniques. All excavation areas opened during the proposed research will be reinstated to ensure minimal on-going impacts.

Mapping and Recording

The extent of archaeological excavation will be recorded electronically by total station or RTK GPS. Trench recording will follow standard archaeological methods, including drawing and photographing layers and sections.

Geophysics

Geophysical survey will be carried out in two areas of the Reserve. These include to northern and western slopes where the topography would have supported occupation, but no archaeological features are present. Geophysical survey will involve magnetometry, the results of which will guide future investigation of these areas.

Material Processing

The faunal assemblage and any artefacts will be processed by In Situ Heritage Ltd using standard material culture and archaeozoological methods. Once processed some midden material will be retained for radiocarbon analysis, the remaining midden will be returned to the Reserve. Any artefacts will be held at Tauranga City Council Heritage Collection Storage Facility, Mt Maunganui, and will be notified to the Ministry for Culture and Heritage, as required by the Protected Objects Act 1975. Soil samples will be collected and submitted to Microfossil Research.

Radiocarbon Dating

A large-scale programme of radiocarbon dating will be carried out across the Reserve. Samples will be selected from secure archaeological contexts. The dating programme will be directed toward answering key aims of the research, including the sequence of occupation across the Reserve, and the development of individual features (e.g. shell mounds).

Outputs

Reports will be submitted to Heritage New Zealand in accordance with the conditions of any archaeological authorities granted. A summary of results will be published in a New Zealand-based archaeological journal. For more see Section 10.

6. Indicative Research Programme

Year 1

- Geophysical survey of eastern and western slopes
- High-quality drone imaging of the southern spur, western slopes and eastern slopes
- Archaeological investigation of shell midden and terrace above slip scar (southern spur)
- Analysis of material and submission of C14 dates.

Year 2

- Targeted excavation of 'blank' areas on the eastern and western slopes based on Geophysics
- Collection and submission of soil samples and C14 dates

Year 3

- Targeted excavation of midden mound and living terrace
- Submission of C14 samples

Year 4

- Completion of laboratory analysis

Year 5

- Completion of final archaeological report and publication

7. Indicative Costings (over 5 years)

8. Personnel

s 7(2)(a) - Privacy is an experienced archaeologist of Ngati Te Whiti-Te Ati Awa and Pakeha heritage. She has worked within the heritage sector in New Zealand for 35 years, holding a Master of Arts in Anthropology (Archaeology) from the University of Auckland. She has provided archaeological advice and project management services to Heritage New Zealand (formerly the

NZ Historic Places Trust), NZ Archaeological Association, DoC, Iwi and local authorities. s 7(2)(f)(ii) is a member of Te Tapatoru a Toi (Joint Management Committee between Ngati Awa and the Crown for Tauwhare Pa, Ohope Scenic Reserve and Moutohora/Whale Island). s 7(2)(a) - s 7(2)(a) - Privacy

Ken Phillips holds a MA in Archaeology from the University of Auckland. Ken has extensive experience in New Zealand archaeology, particularly in the Bay of Plenty where he has conducted numerous archaeological excavations and surveys for the past 35 years. Among this work Ken has completed projects within the Mauao Historic Reserve and on numerous sites around the Mt Maunganui area.

s 7(2)(a) - Privacy holds a MA in Archaeology from the University of Otago and PhD from University College London. For the past 13 years s 7(2)(a) has worked as a commercial and research archaeologist in New Zealand, Australia and the United Kingdom. His research focusses on the early period settlement in New Zealand and pre-contact demography.

Further personnel will be engaged to complete specialist research (e.g. radiocarbon dating) and to provide guidance where required.

9. Iwi Involvement & Mātauranga Māori

The involvement of iwi in the project is essential. As well as providing cultural support and safety for those working on the maunga, the research should be used to engage iwi in the process of archaeology in order to aid efforts to build capacity and expertise. In particular, nominated cultural monitors and/or rangatahi will be integrated into all parts of the archaeological programme. It is anticipated that employment opportunities would be managed by TCC in the same manner as cultural monitors are currently employed during council-led works, therefore this is not included in the current costing.

Mātauranga Māori and western science are complementary and, together, can benefit the understanding of a place for both mana whenua and scientists. The research strategy outlined above provides methodologies and data that are suitable for integration with a programme of research designed to enhance Mātauranga Māori. For example, a better understanding of the nature of archaeological sites on the maunga can inform kaitiakitanga moving forward. Moreover, the scientific outcomes of the proposed research would be improved and by the integration of Māori knowledge. Current best practice in collaborative science in Aotearoa suggests Mātauranga Māori remain under Māori control. Therefore, we welcome the development by the Mauao Trust of a Mātauranga Māori framework, to which archaeological and other scientific methods can be applied to increase the knowledge base about Mauao and Te Awanui (Tauranga Harbour).

10. Outreach and Dissemination

The research programme proposed here will operate under the Heritage New Zealand Pouhere Taonga Act (2014) and will have reporting requirements. The importance of the site necessitates publication of results in a scientific journal, but also requires that information is disseminated to the public. The following section sketches how the latter may be achieved.

In the field

The large number of visitors to the Reserve means there is likely to be considerable interest field work activities. The sensitive nature of the site and potential hazards within work area mean the public will be excluded from the excavations. However, the combined experience of the archaeological personnel listed above is that members of the public will often crowd safety barriers and request site tours or information, which can create considerable time costs. Nevertheless, capturing 'accidental visitors' (i.e. visitors who did not deliberately set out to engage with heritage sites) is an essential part of raising the awareness of the Reserve's history and heritage more broadly. We recommend someone is employed to communicate current results to lay audiences visiting the excavations. This should be in accordance with a clear communication strategy.

A carefully designed programme involving guided tours of excavations and activities focussed on visible archaeological features has great potential to engage children. We recommend such a programme is developed. Advice could be sought from Heritage New Zealand, who have staff specifically engaged in this sort of work.

Finally, the process and results of excavation may be communicated more broadly using both traditional and social media. The potential exists for short films, interviews and other content to be produced. Again, there can be significant time costs to this work, therefore the on-site communicator could also be engaged to front this content, with cameos from iwi and archaeologists.

Documentation

The results produced from this research should be transferrable to the on-going upgrade of the interpretation panels. A skilled science communication (perhaps the person employed on site) can take the grey literature and published accounts of the research to produce a booklet or publication specifically targeted at the lay audience.

The ideas stated above are all compatible with the research programme outlined in this document. However, they are not core components of programme and therefore have not been costed in the current document.

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