Mellons Bay seawall: archaeological monitoring and investigation (HNZPT authority 2015/1337)

REPORT TO
Heritage New Zealand Pouhere Taonga
AND
Auckland Council

Arden Cruickshank
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Prepared by: Arden Cruickshank

Reviewed by: Matthew Campbell

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Mellons Bay seawall:
archaeological monitoring and
ingestion (HNZPT authority
2015/1337)

Arden Cruickshank

Auckland Council have undertaken remediation and erosion control of the Mellons Bay foreshore in the Recreation Reserve (Lot 17 SO 24863 and Lot 11 DP 29081), including installing a two-tiered vertical timber seawall, retaining walls, steps and diversion of stormwater pipes. The seawall is approximately 64 m in length, and is located on the north east (seaward) side of the reserve. Steps for public access to the beach are built into the northern, southern and middle parts of the wall. Two retaining walls are located on the south west (landward) side of the reserve at the foot of the steep slope below Mellons Bay Road. The purpose of these is to divert overland flow to the north west of the reserve, which currently flows down the slopes from the upper car park area and waterlogs the reserve, exacerbating erosion.

Recent erosion had exposed a shell midden along the foreshore. In September 2013 Bespoke Landscape Architects on behalf of Auckland Council commissioned an assessment from CFG Heritage Ltd to inform options and concept plans for the works (Campbell 2013) and, following finalisation of design, Tonkin and Taylor on behalf of Auckland Council commissioned a further assessment in support of authority applications to Heritage New Zealand Pouhere Taonga (HNZPT) (Campbell 2015a).

Auckland Council applied for an authority and the application was accepted by HNZPT on 28 April 2015 with an expectation that the authority would be action-able around 17 June. On 13 May CFG Heritage were informed by Tonkin and Taylor that during site establishment works some of the bank had been trimmed by hydraulic excavator. A site visit by Matthew Campbell of CFG Heritage revealed that for about 18 m at the eastern end of the beach the front of the bank has been cleaned back to remove loose material and the overhanging kikuyu, resulting in perhaps 200–300 mm being cut from the bank, exposing the midden. This provide an opportunity to view the midden in greater detail than during previous visits and confirmed that the midden was disturbed, with dispersed lenses of midden visible above and below the main, denser layer, but this layer has soils mixed through it indicating that it has been redeposited. A damage report was prepared (Campbell 2015b) and works ceased until the authority was issued. Authority 2015/1137 was granted by HNZPT on 22 May 2015 and works were restarted on 8 July under archaeological and iwi supervision. The primary task of building the seawall and retaining wall was ongoing throughout the construction phase, and earthworks were completed 18 November 2015. The secondary task of replacing the stormwater pipe between the upper and lower carparks was undertaken between 16 and 19 September 2015. A final site inspection was carried out on 8 January 2016.

Methodology

All earthworks undertaken on the site were monitored by an archaeologist. Installation of stormwater and sewerage pipes during the mid-20th century had created a terrace that runs along the beach front beneath the sateep slope below Mellons Bay Road. It is not clear what form the foreshore took prior to these works,
but they resulted in a large amount of disturbed midden along the beach front that has little archaeological value. As the earthworks cut back this bank it was monitored to see if any undisturbed material remained in situ. When in situ midden was found, works were stopped so that the archaeologist could record and sample the material using standard archaeological methods. Once earthworks were completed, a final site visit was conducted.

1. Location of Mellons Bay, showing recorded archaeological sites in the surrounding area.
Background

Mellons Bay is located on the eastern shoreline of a peninsula which is separated from the Auckland Isthmus by the Tamaki River. The highest point in the area is the location of the historic Howick Stockade, which is 79 metres above sea level (Figure 1). The remainder of the peninsula consists of gently rolling hills with a single volcanic cone, Ohuiarangī / Pigeon Mountain.

Mellons Bay beach is a small, sandy beach approximately 360 m in length, truncated at each end by sandstone bluffs. A small unnamed creek runs down a north east trending valley to the beach which originates at Bleakhouse Drive. This creek was redirected through a culvert when the gully was filled in to create the lower carpark in the 1960s.

The warm, sheltered waters of the inner Hauraki Gulf would have been a rich source of food for pre-European Maori while the local soils would have been gardened and the wild resources of swamp and forest would have made the area attractive for settlement.

Pre-European Maori history and archaeology

The land to the east of the Tamaki River, with its accessibility to the Hauraki Gulf and, via the Tamaki River and Otahuhu Portage, the Manukau Harbour was an important strategic location for Maori. Despite this, the area has not been extensively investigated, with the only sites that have been investigated related to Council parks (Cable 2007; Cruickshank 2014; Judge 2011; Trilford 2015) or housing developments (Foster 1989). There are a number of sites located within the peninsula, but these appear to have been recorded on an ad hoc basis, rather than as a result of systematic survey and recording. Figure 1 shows several sites recorded in the wider eastern suburbs area with the majority of these (53 in the map) being midden / oven sites, with 13 pit / terrace sites, mostly recorded along the Mangemangeroa Creek where they have not been affected by urban development, and seven pa. This indicates the importance of shellfish gathering and processing, but also that evidence of kumara horticulture and associated pit storage has been largely destroyed since European settlement. The pa would have been the focus of the community and served to protect resources and control movement along the coast.

19th century European history

Initial European settlement began in earnest with the creation of the Fencible settlement in Howick in 1847. Due to Maori unrest in the North Island during the 1840s, Governor George Grey requested additional troops to protect the European settlers around Auckland. The British Parliament approved the formation of The New Zealand Fencible Corps, which consisted of British army veterans with at least fifteen years of service, many of whom had served in Afghanistan, India and China. These ‘pensioners’ were given an acre of land and a two room cottage which after seven years’ service they would own freehold. Four Fencible settlements were established in the greater Auckland area at Onehunga, Panmure, Otahuhu and Howick (Alexander et al. 1997: 87). Howick was the largest of the settlements, with approximately 300 Fencible pensioners and their families. Although placed in a strategic location overlooking the Tamaki River to the north and the Hauraki Gulf to the south, it was said to be too far away from Auckland to defend it (Alexander et al. 1997: 51). While the pensioners were promised houses, they arrived to bare land, and lived in raupo huts for up to two years awaiting the construction of their cottages. During these early years, the Fencibles provided the labour necessary to
develop the village and build and maintain roads to link Howick to the rest of the region.

Investigation

Monitoring of the works were mainly concentrated on the seawall construction, with a small amount of trench monitoring in the lower carpark area and the bank running between the two carparks for stormwater pipe installation (Figure 2). The monitoring of works on the seawall focused on the two phases of work which would generate ground disturbance; the auguring of holes for the piles, and the stripping back of the bank for the installation of the seawall.

Seawall construction

The construction of the seawall required stripping back the bank to remove the overburden and create a cleared area in which to install the seawall. This was stripped using a 5 tonne hydraulic digger with a 1.5 m weed bucket. Three areas where staircases were installed were excavated back approximately 2 m into the terrace.

Midden was identified along the entire face of the bank, but this had been heavily disturbed and redeposited, with plastic and modern glass mixed into it. One section of intact midden was located in the cut made for the central staircase. This is described in more detail below.
Pile auguring

Forty-five 1200 mm deep holes were augured along the bank for the upper retaining wall. These were drilled with a 400 mm diameter auger attached to a 5 tonne hydraulic digger. There was an upper layer of dark topsoil ranging from 50–200 mm with redeposited crushed midden containing modern material mixed through much of it. Below that layer was mottled clay to the base of the excavation. No in situ archaeological material was identified in any of the augured holes.

Stormwater trench

Part of the works involved redirecting the stormwater from the upper carpark down to the main culvert that runs through the lower carpark. This area has been heavily modified, but it was possible that there were in situ features below it.

A trench was excavated in the lower carpark, which was 2 m deep x 600 mm wide, with a bench approximately half way down. Midden was identified approximately 1600 mm below the lower carpark surface. Due to the depth and confined nature of the cut, health and safety restrictions prevented entry into the trench to examine the midden closely. Midden was removed by the digger for inspection, and it proved to be heavily modified and crushed pipi with clay mixed into it. This midden/clay matrix appeared homogenous through the layer, and did not seem to be associated with any in situ archaeological features.

The redeposited midden layer was lying on a mixed matrix, which mainly consisted of medium/dark brown sandy soil intermixed with clay. A small lens of this redeposited midden was identified at the southern end of the trench beneath the modern gutter. There was some modern rubbish mixed into the brown sandy soil/clay layer below it including brick fragments, which indicated that this midden lens was also redeposited and could be the cross section of a swale drain (Figure 3).
Disturbed midden

Disturbed midden was identified along the length of the project area, containing burnt shell and charcoal. The dominant species observed was tuangi cockle (*Austrovenus stutchburyi*) followed by pipi (*Paphies australis*) and lesser numbers of oyster (*Ostrea* sp.) and gastropods. Much of this material had been fragmented and presented as overburden on the bank which was cut back for the installation of the seawall. A number of items were found mixed in with the midden, including plastic, polystyrene and ABC beer bottle glass.

The types of rubbish identified mixed into the midden indicated that it was disturbed at some point between the 1950s and 70s. The most likely cause of the disturbance was the installation of the sewer line, which runs along the beach, underneath the terraced grass area behind the seawall. Although a date could not be determined for the installation of the sewer, the manholes and surrounding stormwater pipes were installed between 1964 and 1965 (Laura Dawson, Auckland Council, pers. comm.) so it is likely that this drain was installed around the same time. This is also when the culvert which has redirected the unnamed creek was installed, so it is also the most likely date for the creation of the lower carpark.

Undisturbed midden

A 6.5 m wide cut was made 2 m into the bank for the central staircase, which exposed the only identified in situ deposit of midden within the project footprint. This section of midden was truncated at the southern end by a stormwater pipe, but it is likely that the midden continued beyond the staircase cut.

There were two cultural layers identified, Layers 1 and 4. Layer 2 consisted of mixed beach sand with and charcoal flecks and a small amount of burnt fragmented shell, indicating a period of abandonment between the deposition of the two cultural layers (Figure 6).

A single firescoop (Feature 1) was identified within Layer 1, which had a sandy base that did not appear to match with the soil matrix of Layer 2. This sandy base (Layer 3) appears to have been intentionally laid with the firescoop built on top.

4. Typical disturbed midden profile (scales = 1 m).
Analysis

Three 10 litre bulk samples were retained for analysis, one each from Layer 4, Layer 1 Feature 1. The samples were dried to obtain a dry weight, then wet sieved through a 6 mm screen, dried, reweighed and sorted following standard archaeological methods (Table 1).

<table>
<thead>
<tr>
<th>Context</th>
<th>Feature type</th>
<th>Dry weight (g)</th>
<th>Sieved weight (g)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Feature 1</td>
<td>Firescoop</td>
<td>13160</td>
<td>6330</td>
</tr>
<tr>
<td>Layer 1</td>
<td>Midden lens</td>
<td>10710</td>
<td>3750</td>
</tr>
<tr>
<td>Layer 4</td>
<td>Midden lens</td>
<td>10400</td>
<td>3010</td>
</tr>
</tbody>
</table>

*Table 1. Weights of 10 litre bulk midden samples.*
Chronology

Two pipi samples were submitted to the Radiocarbon Dating Laboratory, University of Waikato, for radiocarbon dating (Appendix A). One sample was from Feature 1, the firescoop in Layer 1, the other was from the lower Layer 4. The dates indicate two occupations within the late period of pre-European Maori history, the lower occupation around the 16th century while the upper occupation is around the late 17th to mid-19th century, possibly soon before the coming of Europeans. There is no overlap between the two date ranges, even at 95% confidence interval (Table 2).

Shell

Shell identification was undertaken by Danielle Trilford of CFG Heritage. The samples are dominated by pipi (*Paphies australis*) followed by tuangi cockle (*Austrovenus stutchburyi*). Pipi and tuangi cockle are found primarily on sheltered beaches, along harbours and estuaries (Morley 2004: 47, 54). This type of environment is typical of the sheltered inner Hauraki Gulf where Mellons Bay is located. The remaining shells are gastropods, with cat’s eye (*Turbo smaragdus*) in some numbers, indicative of by-catch. There are no substantial differences between the upper, later samples (Feature 1 and Layer 1) and the lower, earlier sample (Layer 4).

<table>
<thead>
<tr>
<th>Context</th>
<th>Lab No.</th>
<th>CRA BP</th>
<th>δ¹³C</th>
<th>cal AD 68%</th>
<th>cal AD 95%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Feature 1</td>
<td>Wk 42851</td>
<td>545 ± 22</td>
<td>1.1 ± 0.2‰</td>
<td>1689–1824</td>
<td>1665–1901 (92.1%) 1931… (3.3%)</td>
</tr>
<tr>
<td>Layer 4</td>
<td>Wk 42850</td>
<td>757 ± 32</td>
<td>1.5 ± 0.2‰</td>
<td>1489–1595 (63.3%)</td>
<td>1605–1615 (4.9%)</td>
</tr>
</tbody>
</table>

Table 2. Radiocarbon dates.

<table>
<thead>
<tr>
<th>Context</th>
<th>Pipi (<em>Paphies australis</em>)</th>
<th>Tuangi cockle (<em>Austrovenus stutchburyi</em>)</th>
<th>Cat’s eye (<em>Turbo smaragdus</em>)</th>
<th>Miscellaneous gastropods</th>
</tr>
</thead>
<tbody>
<tr>
<td>Feature 1</td>
<td>30</td>
<td>791</td>
<td>14</td>
<td></td>
</tr>
<tr>
<td>Layer 1</td>
<td>14</td>
<td>901</td>
<td>56</td>
<td></td>
</tr>
<tr>
<td>Layer 4</td>
<td>166</td>
<td>256</td>
<td>46</td>
<td>9</td>
</tr>
</tbody>
</table>

Table 3. Shellfish NISPs by context.
Fish

Fish identification was undertaken by Matthew Campbell of CFG Heritage. Fish identification followed the methodology outlined in Campbell (2016), adapted from the methodology developed by Leach (1986). Leach's method relied on the identification of five mouth bones: the dentary, articular, quadrate, maxilla and premaxilla; as well as several 'specials' such as pharyngeal of wrasses or barbs of stingrays. Campbell expanded this list to include: the palatine, hyomandibular, opercular, preopercular, ceratohyal, epiphary, supracleithrum, cliethrum, scapula, posttemporal, vomer and parasphenoid; as well as vertebrae.

While few fish bones were recovered from the samples (identifiable bones totalled 46), at least six species were identified (Table 4). Most of these would take a baited hook but yellow-eyed mullet have a very small mouth and would more likely be caught in nets. There is less diversity, but also less fish, from the upper, later samples (Feature 1 and Layer 1). The fish assemblage is indicative of a generalised netting strategy in the nearby waters of the Hauraki Gulf.

<table>
<thead>
<tr>
<th>Context</th>
<th>Yellow-eyed mullet <em>Adricetta forsteri</em></th>
<th>Gurnard <em>Chelidonichthys kumu</em></th>
<th>Shark / ray <em>Chondrichthyes</em></th>
<th>Samper <em>Pagrus auratus</em></th>
<th>Barracouta <em>Thyrsites atun</em></th>
<th>Mackeral <em>Trachurus sp.</em></th>
<th>Fish sp.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Feature 1</td>
<td>1 (1)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Layer 1</td>
<td>1 (8)</td>
<td>2 (2)</td>
<td>1</td>
<td>1 (1)</td>
<td>1 (3)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Layer 4</td>
<td>(10)</td>
<td>1 (3)</td>
<td>4 (1)</td>
<td>1</td>
<td>1 (1)</td>
<td>1 (2)</td>
<td></td>
</tr>
</tbody>
</table>

Table 4. Fish NISPs by context; unbracketed number = count of head bones; bracketed number = count of vertebrae.

Mammal and bird

In addition to shell and fish, rat bone was found in small numbers in Layers 1 and 4, while some broken bird bone, not identifiable to species but of medium size, was found in Layer 4.

Charcoal

Charcoal from the midden samples were sent to Dr Rod Wallace, Department of Anthropology, University of Auckland for species identification (Appendix B). The majority of the pieces identified (74%) were shrub species, indicative of regenerating bush and open scrub, with the only large broadleaf species that were identified were puriri and pohutukawa. Puriri is only found in the lower, earlier sample (Layer 4), while pohutukawa is more prevalent in this sample. The sample is small but may indicate that by the 15th century most of the original forest had been cleared, with only remnant puriri and coastal pohutukawa remaining, while by the 17th–18th century the environment had become even more degraded.
Conclusion

The beachfront at Mellons Bay has been heavily modified through the installation of stormwater and sewerage pipelines during the mid-20th century, which has resulted in the redeposition of midden along the length of the beach. Based on the cut for the central staircase, it appears that there are likely to be further intact sub-surface archaeological features along the beachfront, approximately 2 m behind the newly constructed seawall.

Russell Foster, in 1989, reported the excavation of site R11/1386 at Mangemangeroa Creek (Figure 1), describing terraces, storage pits and midden, with two periods of occupation. He did not analyse the midden and did not date the site. He wrote that: “the Howick – Maungamaunagraoa [sic] Creek area is not well known archaeologically.” This situation has hardly changed. Some site survey work has been undertaken. For instance, Young (1995) described archaeological evidence in Macleans Reserve, but noted that much evidence had been destroyed by development. Surprisingly, the Mellons Bay investigation, while limited in scope and extent, is the first reported pre-European archaeological excavation in the wider Howick area since Foster (1989). More recent residential development to the south of Howick (Botany Downs, East Tamaki, Flatbush) has meant that this area has been well surveyed by archaeologists, but evidence of pre-European Maori occupation is less common on these poorer soils.

There are two phases of occupation at the Mellons Bay site (as also noted by Foster at Mangemangeroa Creek). Charcoal analysis indicates that the Layer 4 occupation, while the earliest at the site, was probably not the first occupation of the area, as the charcoal is already typical of secondary regrowth. By the time of the Layer 1 occupation, the charcoal indicated even greater environmental degradation. There is little meaningful change in shellfish. The fish catch becomes less diverse between Layer 4 and Layer 1, which is again a possible indicator of a degrading environment. At Maungarei / Mt Wellington Davidson (2011) noted that shellfish size declined over time, indicative of intensive harvesting and siltation of the Tamaki Estuary. The Mellons Bay shellfish were not measured but a similar trend is possible. The excavated area and the samples are small and any suggestions of environments declining though time are suggestions only.

A lack of reported excavations in the wider area means that there is little to compare Mellons Bay with directly, so that the excavation along with the Mangemangeroa Creek excavation (Foster 1989) form at best a sparse baseline for future work.
References


APPENDIX A RADIOCARBON DATES
Submitter: M Campbell  
Submitter’s Code: Layer 4  
Site & Location: Mellons Bay, Auckland, New Zealand  
Sample Material: Paphies australis  
Chemical Pretreatment: Sample acid washed using 2 M dil. HCl for 120 seconds, rinsed and dried.

| δ¹³C  | 1.5 ± 0.2‰ |  
| D¹⁴C  | -90.0 ± 3.6‰ |  
| F¹⁴C% | 91.0 ± 0.4% |  
| Result | 757 ± 32 BP |  

**Comments**

- Explanation of the calibrated Oxcal plots can be found at the Oxford Radiocarbon Accelerator Unit's calibration web pages (http://c14.arch.ox.ac.uk/embed.php?File=explanation.php)
- Result is Conventional Age or Percent Modern Carbon (pMC) following Stuiver and Polach, 1977, Radiocarbon 19, 355-363. This is based on the Libby half-life of 5568 yr with correction for isotopic fractionation applied. This age is normally quoted in publications and must include the appropriate error term and Wk number.
- Quoted errors are 1 standard deviation due to counting statistics multiplied by an experimentally determined Laboratory Error Multiplier.
- The isotopic fractionation, δ¹³C, is expressed as ‰ wrt PDB and is measured on sample CO₂.
- F¹⁴C% is also known as Percent Modern Carbon (pMC).
**Feature 1**

*Paphies australis*


Sample acid washed using 2 M dil. HCl for 120 seconds, rinsed and dried.

### Results

| δ⁠₁₃C   | 1.1 ± 0.2‰ |
| D¹⁴C    | -65.7 ± 2.6‰ |
| F¹⁴C%   | 93.4 ± 0.3% |

**Result** 545 ± 22 BP

**Comments**

- Explanation of the calibrated Oxcal plots can be found at the Oxford Radiocarbon Accelerator Unit's calibration web pages (http://c14.arch.ox.ac.uk/embed.php?File=explanation.php)
- Result is Conventional Age or Percent Modern Carbon (pMC) following Stuiver and Polach, 1977, Radiocarbon 19, 355-363. This is based on the Libby half-life of 5568 yr with correction for isotopic fractionation applied. This age is normally quoted in publications and must include the appropriate error term and Wk number.
- Quoted errors are 1 standard deviation due to counting statistics multiplied by an experimentally determined Laboratory Error Multiplier.
- The isotopic fractionation, δ⁠₁₃C, is expressed as ‰ wrt PDB and is measured on sample CO₂.
- F¹⁴C% is also known as Percent Modern Carbon (pMC).
APPENDIX B CHARCOAL ANALYSIS
Introduction

Three charcoal samples from excavations Mellon’s Bay Seawall (S14/1366) Auckland were submitted for identification and report. The results are given below.

**Mellon’s Bay Seawall (S14/1366) - F.1**
Bracken root 1
Tutu 2
Hebe 2
Coprosma 3
Fivefinger 5
Manuka 5
Mahoe 9

**Mellon’s Bay Seawall (S14/1366) - L.1**
Monocotyledon 1
Tutu 2
Hebe 2
Coprosma 3
Manuka 5
Pohutukawa 2

**Mellon’s Bay Seawall (S14/1366) - L.4**
Hebe 1
Coprosma 4
Manuka 3
Ngaio 1
Mahoe 1
Pittosporum 1
Puriri 3
Pohutukawa 10
### Summary of Charcoal Results

<table>
<thead>
<tr>
<th>Species</th>
<th># pieces</th>
<th>Plant type (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fernroot</td>
<td>1</td>
<td>1.5%</td>
</tr>
<tr>
<td>Monocotyledon</td>
<td>1</td>
<td>1.5%</td>
</tr>
<tr>
<td>Tutu</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>Hebe</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>Coprosma</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>Fivefinger</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>Pittosporum</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Ngaio</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Manuka</td>
<td>13</td>
<td></td>
</tr>
<tr>
<td>Mahoe</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>Puriri</td>
<td>3</td>
<td>Shrub and scrub spp. (74%)</td>
</tr>
<tr>
<td>Pohutukawa</td>
<td>12</td>
<td>Large Broadleaf trees (23%)</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>66</strong></td>
<td></td>
</tr>
</tbody>
</table>

### Discussion

Shrub and scrub species dominated (74%). The charcoal with puriri and Pohutukawa being the only large broadleaf trees present.