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WHEN IS A SHELL MIDDEN NOT JUST A SHELL MIDDEN? EXCAVATIONS ON THE PURIRI RIVER, HAURAKI PLAINS.

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A series of excavations were carried out on sites located on the Puriri River (Fig.1), in late 1991 and early 1992. The work was part of an on going research programme based on the Hauraki Plains which has been largely precipitated by flood mitigation and control works. Initially attention was focused on attempting to relocate the site of the Puriri mission station. Three shell middens were discovered during this phase of the work. In the meantime, stopbank and drainage work was progressing from the Puriri mouth upstream towards the mission station site. As this work progressed other sites, mostly shell middens, some recorded and some not, were exposed and partly destroyed or were to be threatened by work yet to be done. Eight of these shell midden areas were either sampled or excavated. These are the subject of this paper.

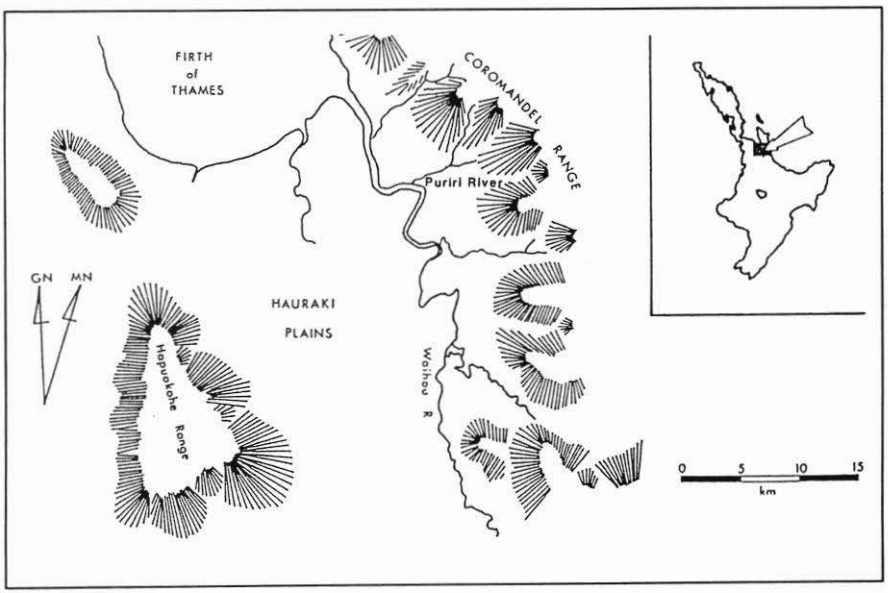

Figure 1. Puriri River, Hauraki Plains.

INTRODUCTION

Archaeological research on the Hauraki Plains has a long and somewhat controversial history (see Best, S. and Allen, H. 1991). The first half of the twentieth century was characterised more by the pillaging of sites rather than research. It was not until 1979, when a comprehensive survey of the east bank of the Waihou's first 35 kilometres was done, that a more detailed picture of this very rich archaeological landscape was fully realised (Best 1979). This is also when sites were first recorded in the Puriri area.

Salvage excavations of the pa sites of Raupa, Waiwhau and Opitau (all near Paeroa) and at Oruarangi, were carried out during the 1980s and early 1990s (Allen in prep., Best and Allen 1991, Phillips 1986, 1988, 1991, Prickett 1990). These excavations were precipitated by stopbank construction work.

Although the catchment authorities, the Historic Places Trust, and the archaeologists had knowledge of site locations over this period (1980-1990) along the eastern side of the Waihou, damage was done to the majority of known archaeological sites without any other authority applications and without any monitoring. This situation only changed with the appointment of a regional archaeologist for the Waikato Conservancy of the Department of Conservation. Comprehensive site surveys have also now been completed on the west side of the lower Waihou River and east side of the Piako River (Crosby and Loughlin 1991, 1992). Results of the archaeological investigations at Puriri have also been completed (Bedford and Allen 1992).

Initial interest in the Puriri area, for its archaeological research potential, stemmed from the historical accounts of missionaries who visited the area in the 1820s and 1830's. A mission station was set up in the area in 1833, the first south of the Bay of Islands. It was abandoned, however, in 1837 and shifted up to Kauaeranga, largely due to what was described by the missionaries as "unhealthy conditions" and a shift in the surrounding Maori population (Preece 1837).

The exact location of the station was not known, but through historical research and discussion with Puriri locals we were able to pinpoint its likely location. The site was potentially in the impact area of proposed stopbank work.

Initial investigations were carried out in August 1991, with a two week excavation of the potential mission station site being completed in December. No definitive material evidence for the mission station was found. One of the difficulties in finding any structural remains that could be definitely associated with the ephemeral mission station was its location adjacent to the large bend on the Puriri River. This is at the tidal limit on the river, once the location of a ford and the highest point that the river traffic could proceed upstream. The mission wharf was followed by a number of later wharf structures, buildings and a tram line which was used in the latter part of the nineteenth century.

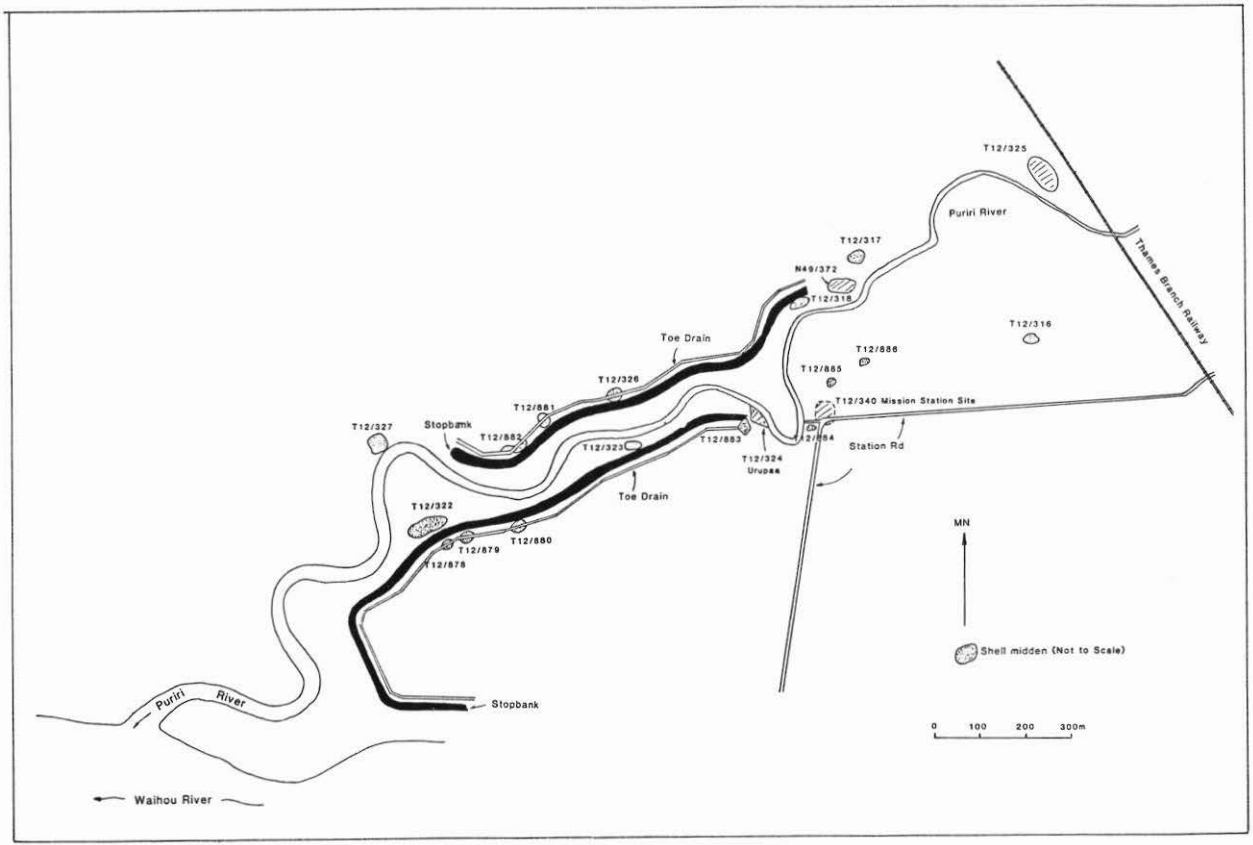

Figure 2. Location of archaeological sites on the lower Puriri River.

Straightening of the river has now destroyed the bend and consequently the physical correlate that made this spot a focus of settlement and use. For a more detailed discussion of the work see Bedford and Allen (1992).

During the excavations at the mission site in December areas of shell midden, previously unrecorded (T12/340, 885, 886), beneath, adjacent and upstream of the possible mission station site, were also investigated (Fig.2). The work on the shell middens was expected to provide evidence as to whether they were earlier, contemporary with or later than the mission station site.

A second phase of archaeological activity began when stopbank work on the Puriri, south of the mission station site, commenced in 1992. The presence of an urupa, previously unknown to the Regional Council, was located on an early survey map. Some short distance from the urupa a shell midden (T12/883) had been exposed during the construction of the toe drain. This midden contained European ceramics and nails. It was thought the site may possibly have been related to Matapihi's village which had been set up adjacent to mission station in the 1830s. As such, the site could provide valuable information regarding this early period of Maori interaction with the missionaries and evidence regarding the flow of European goods into the Maori community as far as these might be reflected in the middens.

The excavation of the above midden (T12/883) was carried out from the 17th to the 21st of April, 1992. During this period a detailed survey of the area on both banks of the Puriri River south towards the Waihou was also carried out. It was noted during the survey work that several previously recorded sites has either been damaged (T12/322) or virtually destroyed (T12/326) during construction of the stopbank and drain. Other sites upstream and across the river from the mission station site had also been exposed through machine scraping (T12/318). In addition, the digging of drains on the outer edge of each stopbank revealed a number of previously unrecorded and unknown midden and activity areas (T12/878, 879, 880, 881 and 882). Discussions were held with the Regional Council, Historic Places Trust and trustees to plan for yet further investigations of several of the above middens, and an excavation at T12/882.

ARCHAEOLOGICAL INVESTIGATIONS

The discussion of the fieldwork is divided into four parts each reviewing the work and results from particular sites in a particular area.

A. T12/340 (Area D2), T12/885 and T12/886.

T12/340 (D2).

During the attempts to locate the site of the Puriri Mission Station a test pit (2 x 1m) was excavated near the banks of the river. The section showed that

there had been extensive riverside reclamation during the 1870s. Beneath flood silt, cobbles and a clay dump, large deposits of shell midden were revealed (Fig.3). The midden, made up of pipi and cockle, contained, small amounts of fish bone and was very crushed. No European material was recovered. (C14 dates; Wk-2644, shell Cal AD 1674; Wk-2641, charcoal modern).

T12/885.

This shell midden area was previously unrecorded and was identified through probing. An area of 3 x 1m was excavated. The midden was 10cms thick and lay beneath 25cms of silt. Associated postholes were also recorded. The midden was again made of pipi and cockle, with no European material present. The shell was very crushed.
(C14 dates; Wk-2645, Cal shell AD 1674; Wk- 2642, charcoal, modern).

T12/886.

An area 2 x 1m was excavated. Midden and postholes were again revealed at a depth of 25-40cms but also a drain feature and postholes at 70cms. Very crushed pipi and cockle made up the midden. Again no European material was present.

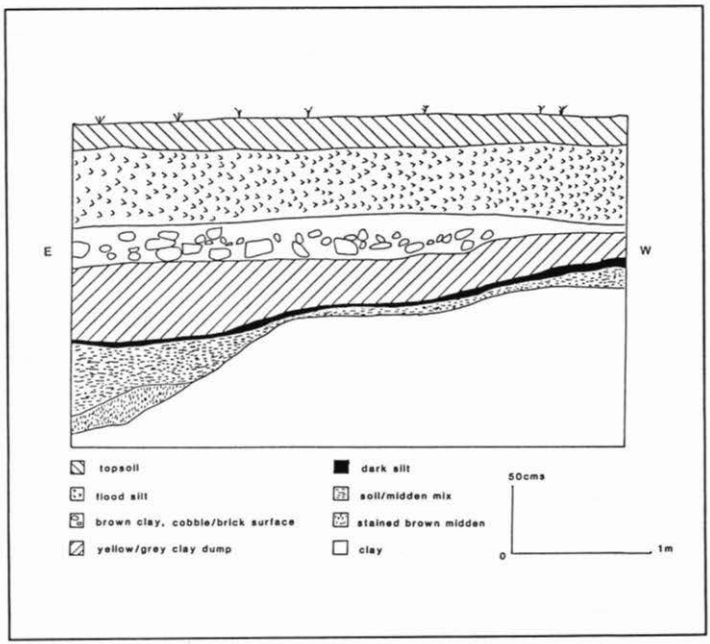

Figure 3. T12/340, D2, North Section.

Figure B: T12/883.

As mentioned earlier, this midden was exposed during the construction of a toe drain (Fig.4a). Two periods of excavation were carried out on this site. The midden covered a circular area of fifteen metres in diameter. The shell averaged 20cms in thickness, lying on top of a silt layer and heavy clay. Several firescoops were identified in what appeared to be a large cooking area (Fig.4b). Many European artifacts were recovered, including ceramics, bottle glass and metal. The site was a single period occupation site and the recovered material appeared to date to the 1870s/1880s.

It appears that the shell had both been used as a food source and once consumed used as a fill, creating a more free-draining surface. Features beneath the shell included two drains on the outer edge of the shell area and a series of postholes which suggested quite substantial windbreaks/shelters had been erected. These can be interpreted as cooking shelters suggesting that the pattern of separate sleeping/living arrangements with a detached cooking area continued into the latter part of the nineteenth century.

Historical research of early survey maps revealed a house site existing in the immediate vicinity of the midden. Further excavation was carried out in the area but during the intervening weeks further work on the stopbank had been completed and covered the likely site of the house. (C14 date; Wk-2646 shell Cal AD 1706).

C: T12/882, T12/878, T12/879.

T12/882.

Excavation of the midden T12/882 proceeded in tandem with the work at T12/883. An area or 4 x 2 metres was excavated and midden samples were taken. Samples of both shell and charcoal were submitted for dating. The midden had been exposed and disturbed by machine scrapping. It lay directly on top of natural clay and was on average 20cms thick and had covered an area of c. 20 by 5 metres, which had been truncated by the construction of the toe drain. It appears that again the shell had been used as a food source and as a fill. Several stakeholes and a hearth were also revealed. (C14 date; Wk-2643, shell Cal. AD 1684; Wk-2640, charcoal, modern).

T12/878.

A midden layer previously c. 12 x 8 metres but cut through by the toe drain so that only 2 metre wide remnants are now visible on either side of the drain. A sample of the midden was taken for analysis.

Figure 4a. T12/883. Start of the excavation. Note the toe drain in the foreground. The urupa is near the tall willows to the right.

Figure 4b. T12/883. Firescoop and drain features exposed after the removal of the shell midden.

T12/879.

A shell midden c. 12 x 10 metres (50 cms deep) covered by 75 cms of silt and cut through by a toe drain. This was a pipi shell midden with shell, ash and hangi stones visible on either side of the cutting. A sample of the midden was taken for analysis. The three middens in the area, T12/322, 878 and 879 appear to form a cluster of sites.

D: T12/318.

T12/318 was another shell midden which was disturbed by machine while we were working in the area. It was semi-circular in shape and measured 15 metres in diameter. The midden was covered by silt that had mostly been removed by scraper and was on average 20-25 cms thick. The area again appeared to have been used for cooking, but had had several periods of use. Items of European material which dated to the 1870s were recovered from firescoops on the uppermost layers of the midden. The outline of a house site with mostly rectangular postholes was excavated beneath the shell midden (Fig.5). Fragments of some of the posts remained, these were either kauri or matai (R. Wallace pers. comm.).

It appeared that a layer of crushed shell had been placed on the floor surface. No internal hearths were recorded, possibly due to the damage to at least half the site by machine scraper.

Figure 5. T12/318. Completed excavation showing house site.

SHELL MIDDEN CONTENTS AND DATING.

The samples taken from each midden were washed and sorted once returned to the laboratory. The samples were run through a series of sieves ranging in size from 1, 2, 6.7 and 13.2 mms. Whole shells and hinges of the different identified species were separated. The remaining material was bagged and weighed according to the corresponding sieve size. The hinges of both the pipi (*Paphies australis*) and cockle (*Chione stutchburyi*), the dominant species present, were measured. In the case of pipis, this gives a good indication of overall shell size. It is not quite as reliable with cockle. Minimum numbers were calculated by counting the numbers of left or right hinges and recording the larger figure of the two. Small numbers of gastropods (*Cominella gladiformis* and *Xymene plebeius*) were also identified amongst the middens (Table 1).

Table 1. Summary of Species Percentages and Hinge Measurements by Site.

Sites	Pipi, % of total	Cockle, % of total	Misc., % of total	Pipi, mean hinge size	Cockle, mean hinge size
T12/879	94	5	1	3.3mm	3.1mm
T12/880	94	4	2	3.6mm	3.9mm
T12/882	80	20	0	3.5mm	3.1mm
T12/883	74	22	3	2.7mm	3.5mm
T12/885	47	52	1	3.0mm	3.4mm
T12/886	48	47	5	3.0mm	3.4mm
T12/318	68	31	1	3.4mm	3.2mm
T12/340 D2	77	22	1	4.5mm	3.0mm

As shown on Table 1, the eight midden samples taken from sites on the Puriri River show a marked degree of similarity in their composition. All are predominately made up of pipi (*Paphies australis*) and cockle (*Chione stutchburyi*) with small components of gastropod (*Cominella gladifornis* or *Xymene plebeius*). Six of the eight middens are dominated by pipi, middens T12/885 and 886 stand out in that their composition is almost 50/50 pipi/cockle. I suggest this dominance of pipi indicates a species preference rather than availability. Pipi represents greater meat value per unit than cockle, so they may

have been selected for this reason (Graham et al. 1991:40). Both are a common shellfish, found in similar environments. The most likely source for the people of the Puriri area would have been the Firth of Thames, 10kms downstream.

Table 2. Summary of Percentages of Crushed Shell verses Hinges and Whole Shell.

Sites	1, 2, 6.7, 13.2mm Sieve Sizes, % of total	Hinge/whole pipi and cockle, % of total
T12/879	64	35
T12/880	55	45
T12/882	86	14
T12/883	64	35
T12/885	77	22
T12/886	85	10
T12/318	85	15
T12/340 D2	91	8.5

The presence of the gastropods (of which none are larger than 4mm) appears to suggest wholesale collection from the shellfish beds. These shells represent virtually no food value and are associated with pipi and cockle beds. If careful selection was taking place, it is unlikely these shells would have appeared in the midden. The practise of wholesale collection is also reinforced by the presence of dead shells having been collected also. There are numerous examples of shells that have been eaten (drill holes) by carnivorous gastropods and some of the shell also appear to have been heavily sea washed. Similar remains were highlighted by Nicol when analysing shell samples from Oruarangi, a large shell mound pa, two kilometres to the north of Puriri. He suggested that shell was being quarried from drift deposits on the coast (Nicol 1980:96) to build up the mound. Similar activity may have been carried out at Puriri on a much more limited scale.

The hinge size of pipi from the various sites is on average 3.3mm. Only two samples differ greatly from this average, namely T12/883, which is much smaller at 2.7mm and T12/340, which is much larger, at 4.5mm. T12/883 is an historic site dating to the 1870s or 80s. The small average size of the shell may be an indication of increased pressure on the resource. As noted below, T12/340 has been radiocarbon dated to the late prehistoric/early historic period,

the very large hinge size may be an indication that a new area is being exploited. As mentioned the measurement of cockle hinges is not as reliable for an indication of overall size.

As mentioned the midden samples were run through a series of sieves and percentages of crushed/part shell was separated from whole shell and hinges. The percentages from each of the sites is shown on Table 2. When looking at the percentages of crushed shell to whole shells and hinges, the dominance of the crushed shell is dramatically demonstrated. Only one of the sites (T12/880) shows any parity between crushed and hinges/whole shells. The remainder all show a high level of crushing. As has already been suggested this indicates the use of the shell both as a food source and as a material for building up a free draining surface where subsequent crushing took place.

RADIOCARBON DATES

The three radiocarbon dates calculated from the charcoal samples all fall within the period 1750-1950. The corresponding shell dates from the same sites have a mean mid-seventeenth century date. Given the vagaries of dating different C14 fractions in charcoal and shell, it is arguable whether the shell and charcoal dates are statistically different in each case. All indicate site use in the late prehistoric/early historic period 1750-1860, with the archaeologically most recent site (T12/883) giving the youngest C14 date (though this is estimated to be 100 years older than the actual date of occupation). There are two possible explanations. Either the marine C14 calibration for New Zealand shells (McFadgen 1990) is c.100 years too young for the Firth of Thames or dead shell may have been brought to the sites and used specifically as a material to build up a free draining surface. Their presence would cause the shell date to appear somewhat older than the charcoal dates and the period of site occupation. Phillips (pers. comm.) has summarised the dates available for the fossil shell beds formed at the previous mouths of the Waihou River at 1500-3000 BP. The young age of the C14 shell dates on the Puriri River indicates that shell from fossil beds was not being collected and the dead shells were likely to have been amongst living shellfish which were being collected as a food source.

DISCUSSION AND CONCLUSION

Initial work centred on the location of the Puriri Mission Station, an important site in historical terms. It was the first mission station south of the Bay of Islands and became a focus of Maori/European contact in the area in the early 1830s. However, definitive archaeological evidence for its location was not found. Focus then shifted to what were initially identified as pre-European and

historic shell middens located along the banks of the Puriri River.

The excavation of a sample of these types of sites located on the Puriri River has enabled the sites to be more fully understood before destruction. Initially midden and hearth sites are often seen as simply shell heaps or refuse dumps offering little further information than a record of their existence. The excavation of the so called shell heaps revealed a variety of prehistoric and historic Maori occupation areas, and evidence of changing patterns of settlement and site use along the Puriri River during the early historic period.

Table 3. Radiocarbon Dates from the Shell Middens.

Site No.	Radiocarbon Shell Date BP	Calibrated Shell Age	Radiocarbon Charcoal Date	Comments
T12/340 D2	630 + 55 Wk-2644	Cal AD 1674 Cal BP 276	modern Wk-2641	late prehistoric/ early historic
T12/882	600 + 55 Wk-2643	Cal AD 1684 Cal BP 266	modern Wk-2640	late prehistoric/ early historic
T12/883	570 + 55 Wk-2646	Cal AD 1706 Cal BP 244	------	historic/mid - nineteenth century
T12/885	620 + 55 Wk-2645	Cal AD 1674 Cal BP 276	modern Wk-2642	late prehistoric/ early historic

modern = falls within the last 200 years (1750-1950).

Some middens simply represent simple cooking and refuse dumping sites (T12/340 D2). Others, however, revealed considerable evidence for structures or could be seen to be part of residential or garden complexes. The sites also indicate that in this area continued occupation occurred from the prehistoric into the historic periods. It has been demonstrated also that similar practises of using shell both as a food source and to create a free draining living surface being carried out in the prehistoric and historic periods.

A likely prehistoric settlement pattern for this part of the Waihou Valley is settlement concentrated at one of the defended artificial swamp pa (Pouarua, nearby on the banks of the Waihou is the likely contender for the Puriri area), with scattered gardening and residential sites. The area was largely abandoned after the fall of Totara pa, the Ngati Maru stronghold, in 1821. People returned to the area in the early 1830s after the battle of Taumatawiwi in the Waikato. At the time the mission station was established, settlement was dispersed, with the mission clientele moving between Kauaeranga, Kopu and Paeroa. Later some permanent settlement along the Waihou and smaller streams began to be established.

The midden sites that were bereft of any articles of European origin might have been contemporary with or occupied earlier than the mission station itself. The absence of European items is not a sure chronological marker of prehistoric status for middens in the Waihou catchment.

In general shell middens and other sites excavated on the Puriri River, or elsewhere on the Waihou River, and presumably dating to the period 1790-1840 (eg.,Waiwhau, Raupa and Opitau) contain few items of European manufacture or evidence of economic change. On the other hand middens dating to the middle and later part of the 19th century, for example T12/883, have abundant, if broken pieces of metal, glass, ceramics in shell middens that exhibit both continuity and changing use of this site type. Continuity is seen in the shell midden itself, the drains and the cooking areas. Change is clearly seen in the makeup of the midden. If the number of objects of European manufacture in shell middens can be taken to represent a rough measure of the degree of acculturation or change in Maori society and/or economy, then the evidence from the Puriri middens is that substantial change did not take occur in this region until the latter half of the nineteenth century.

The lessons of the Puriri are that firstly, in an area where shell is used as a construction medium, even quite insignificant patches of shell can hide significant structural and settlement evidence. Secondly, that surveys and excavations of the sites are essential if we want good archaeological evidence for changes in the late prehistoric and early historic settlement patterns and material culture. And finally, that the majority of sites that could be used for these studies, small shell midden settlement sites, located along stream terraces of the Waihou tributaries, have already been destroyed by flood control works despite the existence of the Historic Places Act and locational and site record knowledge of at least some of them.

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