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PRELIMINARY OBSERVATIONS
RELATING TO THE COASTAL SHELL MIDDENS OF MANAWATU

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Napier

The Manawatu coastline is that portion of the south-west coast of the North Island of New Zealand between the Rangitikei and Manawatu rivers (Fig. 1). This section of coastline is 19 km long, presently intersected by only three small streams (from north to south, Pukepuke Lagoon stream, Lake Kaikokopu Stream and an apparently unnamed stream which flows to the south of Lake Koputara and then out to the coast).

Behind the mobile foredunes are extensive sand plains and "long, low parabolic dunes" (Esler, 1978:11). The character of the sand plains can change rapidly and the development of distinctive features has evolved significantly in the last 50 years (*ibid*: 85-93). The middens discussed below are located on the floor of the sand plains, between (not on) the parabolic dunes behind the foredunes. This is to be expected on a mobile coastline where "sand is so plentiful that the coast moves seawards 0.6 - 1.0 m each year and the foredunes move forward a corresponding distance" (*ibid*:88), although this rate of coastal progradation may not have been constant over a long period of time.

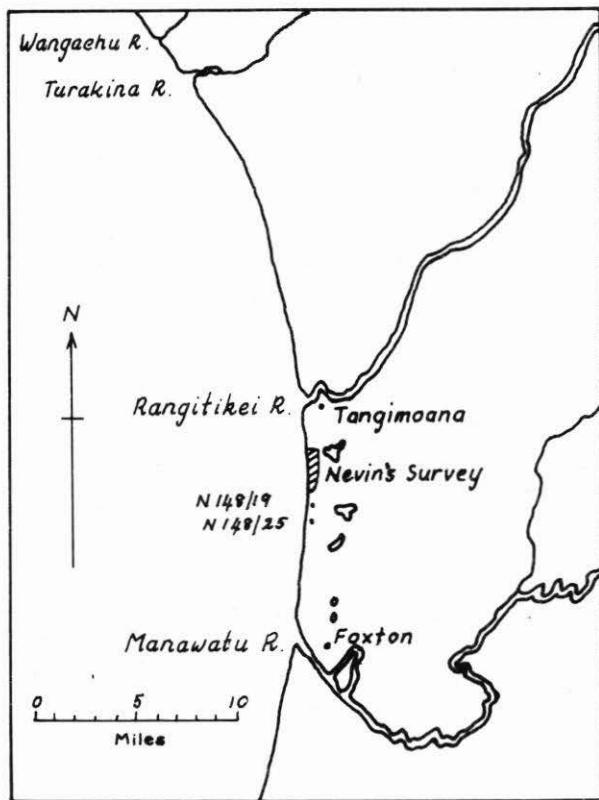
The climate of the sand country is characterised as north to north-west winds, relatively frequent gales, an annual rainfall of 889-1270 mm, warm summers and mild winters (Cowie et al., 1967:9-12).

Information on the coastal middens of Manawatu comes from three sources: a survey undertaken for the New Zealand Forest Service at Tangimoana by D. and G. Nevin during October 1979, a preliminary survey of sand dune plains by the Manawatu Museum Survey team in December 1979, and the excavation of two middens in 1972.

Nevins' 1979 survey

Twelve midden sites (N148/6-17) were recorded in the Tangimoana State Forest between the Pukepuke Lagoon stream and Himatangi. Although this is a small number of sites, some very useful observations can be made. The middens appear to fall into two reasonably discrete groups parallel to the coast. The first group falls within an area about 125-300 m from the sea, while the second group begins at about 600 m and extends to as much as 800 m inland.

FIGURE 1. The
Manawatu coast.



Given the progradation of the coastline these two lines of middens may come from two different periods, the furthest inland being the oldest. There is, however, no apparent difference in the composition of the middens. All of them are almost completely dominated by tuatua (Paphies s. subtriangulata) with very small numbers of Spisula aequilateralis. No bone material was recorded. Oven stones are recorded on every site. Some sites have from three to seven discrete mounds of shell. Shells occur naturally to about 120 m inland from high tide mark and all the middens are inland from this point. Most of the middens are badly wind deflated or damaged by recent human activity.

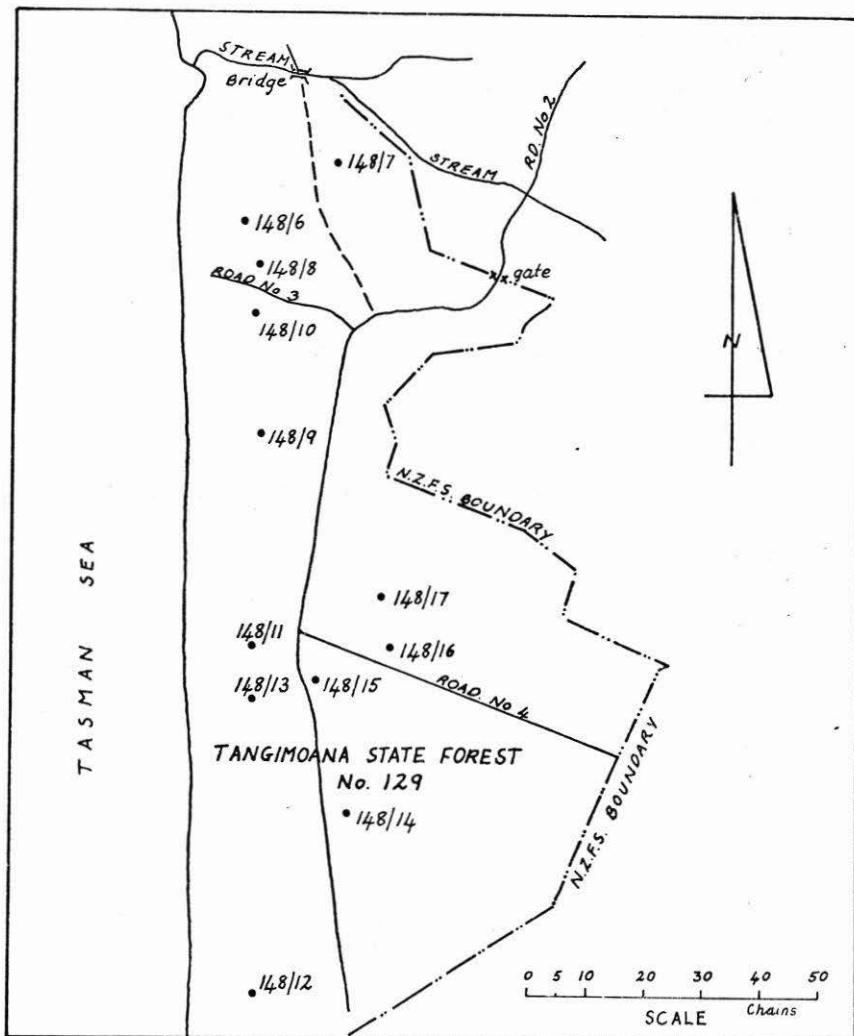


FIGURE 2. Nevins' archaeological survey.

Manawatu Museum survey 1979

With the assistance of two Student Community Service Programme personnel I investigated the problems likely to be encountered in recording midden sites in the sand dune plains between Tangimoana and Foxton. Unfortunately, neither satisfactory aerial photographic enlargements nor topographic maps were available: it was found impossible to accurately locate sites on small scale aerial photographs of the sand dunes, and the NZMS1 map, N148, lacks the necessary topographical detail. The Nevins' State Forest Survey had the advantage of having low level aerial photographs and detailed large scale maps. Therefore, this larger scale research programme will have to be repeated using aerial photograph enlargements with grids superimposed before the sites can be accurately recorded in the Site Record File. However, some useful generalisations about the coastal sand dune middens can be made as a result of this research.

Comments here are confined to middens observed between Himatangi and Foxton. Twenty-three discrete middens were recorded, some in close proximity to each other in sand plains (Plate 1), others in isolated mounds. The largest midden had twelve mounds of shell covering a large area with at least eight discrete surface areas of fire cracked oven stones. All the middens are dominated by tuatua and no fish or bird bone was recorded. All the middens fall within a band 100-300 m from the sea. The area further inland was not thoroughly investigated as the research was principally concerned with sites in the sand plains directly behind the fore-dunes.

The condition of the middens is uniform in that they are all badly wind deflated and leached. The large midden mentioned above has also been modified by motorcyclists. This is a conservation management problem in an area which is frequently used for motorcycle recreation.

No artefacts are known to have been recovered from any of the coastal shell middens between Tangimoana and Foxton during organised surveys, casual observation, fossicking or excavation. Midden composition, condition and location do not appear to differ along the Manawatu coast, though there is at present some evidence to suggest the presence of larger middens towards Foxton. The second band of middens, circa 600-800 m from the sea, tentatively identified from the Nevins' Forestry Survey, was not found south of Himatangi.

Excavations

Shell midden N148/19, about 1 km north of Kaikokopu Stream, Himatangi, was excavated during July, August and September 1972,

by a group of amateur archaeologists led by Jim Lundy and Mina McKenzie. The midden covered an area 9.5 x 8 m and was marked out in a 6 ft square grid. Two squares were excavated. The midden was found to have only one occupation layer. The results of the excavation are summarised below.

The midden was dominated by tuatua though small numbers of Spisula aequilateralis, scallop (Pecten novaezealandiae), mussel (Mytilus edulis), ostrich foot (Struthiolaria papulosa) and Dosinia anus were recovered. Pumice fragments were found throughout the midden, as were stone ovens. One intact oven was excavated at the base of the shell midden.

Charcoal samples were collected and a sample has been submitted recently for C14 dating. Some fragments of bird and fish bone and small amounts of fish scales were recovered. Ron Scarlett has identified the four bird bones recovered as follows: fairy prion (Pachyptila turtur) 1 right ulna; fairy prion? 1 metacarpal of left carpo-metacarpus; broad-billed prion (P. vittata)? 1 left ulna (lacking proximal end), 1 part shaft of left humerus. It is not presently possible to identify the fish remains which consist only of vertebrae and scales. The only stones recovered, other than oven stones, were a number of quartzite pebbles.

As the shells were excavated from the midden, ten tuatua shells were measured from each bucket and their mean width recorded. Two hundred and sixty-six buckets of shells and sand were removed from one square. The individual shells measured between 30 and 50 mm. The mean width of the ten measured shells from each bucket ranged from 30.5 mm to 42.9 mm. This data clearly indicates that the shells being exploited were from the smaller size range of the species. The size range given by Powell (1979:416) is 48.5 mm - 76.0 mm. Also demonstrated is the relative uniformity of size. This is one of the general impressions gained from site survey work right along the coast - that shells are generally small and that size is relatively uniform. N148/19 is about 150 m from the sea and so among the most recent middens.

In June 1972, N148/25, another midden of the same type as N148/19, was excavated. This site is located about 2.4 km south along the beach from Himatangi township and about 300 m from the beach, behind the foredunes. There were tuatua and Spisula, heat shattered stones, pumice and charcoal visible on the surface. Excavation added only insignificant numbers of other shellfish species and two pieces of bird bone. As with N148/19, no stratigraphy was documented by the excavators, indicating occupation of the area over a short period. Two bird bones were recovered and have been identified by Scarlett as black-backed gull (Larus domin-

icus), left humerus; fluttering shearwater? (Puffinus gavia) small left radius. Excavation records and material retained suggest no significant difference in the activities being undertaken at N148/25 and N148/19. One charcoal and two tuatua shell samples have been submitted from N148/25 for carbon dating.

Interpretation of coastal shell middens

The coastal dunes and beach are known to have been the major route for travellers moving along the south-west coast of the North Island. Although some tracks are known to have existed through the forest between the major rivers, these are thought to have been for shorter journeys or to gain access to major inland waterways for west-east journeys. This transport system is also reflected in early European travel which was predominantly on rivers and along the coast, either by ship or along the beach. The middens, therefore, may in part have resulted from groups of people moving along the coast, exploiting shellfish beds as they went.

The middens may also have resulted from the seasonal movement of the communities living along the Rangitikei, Manawatu and Oroua rivers to the coast to exploit the shellfish. Research on the growth rings of the shells might confirm seasonal gathering. There is no evidence of general activities which one would expect on a general living site. The absence of bone may, however, be explained by the destructive conditions of the sand plain environment. An important factor may be the seasonal rise in the water table to surface level.

A problem with the recording of sand dune middens on the Manawatu coast is the constant covering and uncovering of middens, especially during periods of high winds. Middens recorded in a survey may be covered the following year, new middens may be uncovered. The middens are not continuous along the coast, but appear to concentrate in certain areas. Initial analysis suggests that greatest concentration is in proximity to permanent or semi-permanent waterways.

Comparison with Horowhenua coastal middens

Adkin (1948:38-63) has outlined site distribution and described the artefacts recovered from the sand dune middens in the Horowhenua area. In Horowhenua he has distinguished three concentrations of middens: "One, approximately opposite Lake Horowhenua, from a little north of the Wai-rarawa Stream to Rakauhamama; a second, on the south side of the Waikawa River; and a third and, so far as is visible in these latter days (1940s), the

smallest of the series a little to the north of the Wai-tohu Stream, near Otaki" (*ibid*:39). There are middens in between the areas mentioned above, though these do reflect areas of concentration, all relatively close to streams. Adkin identified two lines of dunes which he documented most fully in the Wairarawa-Rakauhamama group:

"There the younger belt extends from the present foredune inland for rather less than a quarter of a mile; the older belt lies farther inland and extends from 30 chains to 100 chains in from the foredune. In this group there seems to be a hiatus of roughly 10 chains to 15 chains between the younger belt and older ..." (*ibid*:39)

The younger middens closest to the coast he describes as consisting of,

"Loose, often widely-scattered masses of shells almost exclusively of the pipi (Amphidesma subtriangulata = Mesodesma subtriangulata) and the tohemanga (Longimactra elongata); practically no artifacts are associated therewith; large quantities of water-worn pumice and much drift-timber..." (*ibid*:39).

It should be noted that Adkin's 'pipi' are really tuatua.

The older line of shell middens further inland, are quite different and characterised by compacted shell beds which Adkin states consist of,

"... pipi and two species of cockle - the tipatipa (Dosinia anus) and the kaikaro (Spisula aequilateralis). The tohemanga is conspicuously absent, but there is often a curious admixture of seemingly useless types of mollusca - tiny univalves, coronet barnacles, etc.... Pumice and drift-timber are entirely absent..."

But the most striking and important feature of the older middens is the frequent presence in association with them of stone and bone artifacts and other objects, and quantities of chips of blackstone, flint, and other rock-types indicating manufacture on the spot." (Adkin, 1948:40)

Adkin is here speaking of a series of archaic middens.

Site N148/1 is the only archaic midden site recorded between the Manawatu and Rangitikei rivers (McFadgen, 1972). This paper is not concerned with these archaic midden sites, but rather with later middens closer to the coast. The above detail has been given to show that Adkin was aware of the different types of midden in his area and to emphasise the point that he was able to identify an homogeneous group of coastal middens of a very similar nature to those described in this paper for the Manawatu coast. Adkin's assumption regarding the activity reflected in these sites is important because he was able to compare the later middens with the more complex earlier ones:

"It is thus evident that the older middens represent centres of community activity whereas the younger middens were merely piles of shell-refuse indicating a single phase and process of food gathering" (Adkin, 1948:40).

R.A. McDonald and E.O'Donnell (1979:57) in their book Te Hekenga : Early Days in Horowhenua make the following comment relating to the coastal middens in Horowhenua:

"...pipis were preserved for winter use by being strung on threads of flax and dried in the sun. This work was done by women while the men were fishing and the huge mounds of pipi shells found along the coast in places were formed as a result of this and not, as has sometimes been said, being merely the refuse from an adjacent pa."

McDonald had an intimate knowledge of the Maori of the Horowhenua area and this comment can be accepted as one interpretation of the type of site discussed in this paper.

It is not possible to identify discrete bands of these more recent coastal middens from Adkin's data as was possible from the Nevin's survey in Manawatu. Apart from this, however, there is a remarkable consistency in distribution, condition and contents of the coastal middens in both areas.

Carkeek (1966:103) makes the following comments regarding coastal middens between Otaki and Paekakariki which are relevant to this discussion:

"Some of the middens close to the seashore between Raumati South and Wainui seem to fall into the temporary category. They consist almost entirely of tuatua shells (Amphidesma subtriangulata) with a few fire stones and, in one case, the presence of well-preserved fish scales with no bones evident seemed to suggest that the fish were merely caught there and carried on to a more permanent dwelling place.

Because of their mode of life in travelling and warfare a large proportion of the food prepared by Maoris was of the dried or preserved variety. Shellfish was often dried and stored for future use. Even at the present day the old process of drying pipis and stringing them out on long strips of thin flax for later use is still carried out by the older Maoris, and it is said that at one time in the Otaki district every house had its store of pipi maroke or dried pipi."

Conclusion

This paper has summarised currently available information relating to Manawatu and has compared these middens with the coastal middens of Horowhenua. Further detailed site recording

is required as are excavations, to provide confirmation of the general observations outlined in this paper. These specialised shell middens appear to be a briefly occupied, seasonal component in the settlement pattern of the later prehistoric and proto-historic Maori of Manawatu and Horowhenua. The pattern of complex dunes, sand plains and peaty swamps extends along the southwest coast of the North Island from Paekakariki north to Patea. Within this distinctive coastal formation the most recent series of coastal middens can be expected to show a similar shellfish exploitation pattern to that outlined for Manawatu in this paper.

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OKATAINA PA. A diver with group of palisade posts.



MANAWATU MIDDENS. Shell middens north of Himatangi, May 1981.