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WATSON'S BEACH (H45/10): PRELIMINARY REPORT

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Introduction

Over the last twenty years, a suite of erosion agents has been gradually destroying an archaeological site complex (H45/10, S172/55) to the south of Watson's Beach across Big Creek. The site was originally recorded in 1977 during a coastal survey for the Historic Places Trust (Teal 1977), but no further archaeological investigation took place. During February 2000 Ken and Margaret Tustin brought the site to the attention of local iwi, and some months later concern about accelerating site destruction prompted contact with the Anthropology Department at the University of Otago.

Over the last eighteen months, members of the Anthropology Department at the University of Otago have been monitoring Watson's Beach to record present conditions, to facilitate future research and to study processes of coastal erosion (Walter and Tucker 2001). This paper serves as preliminary report on the site at Watson's Beach, providing a description of the archaeological material presently exposed and reviewing the fieldwork undertaken to date. Further investigation has the potential to contribute towards several research issues including: cultural change and the Archaic in Murihiku, site type and location on the southern east coast, intra-site spatial patterning, and the management of coastal sites. Additionally, there is little published archaeological work from this region of the Otago coastline.

The site complex H45/10 (S172/55) is located on the Otago coastline approximately ten kilometres south of the Taieri River Mouth. The NZMS 260 grid reference for H45/10 to the nearest 100 metres is H45 899 457. The site is situated at the base of sloping hills, along a beach between a rocky headland and Big Creek. Technically, Watson's Beach is the strip of beach to the north of Big Creek, while H45/10 occupies the sandy bay to the south. Aerial photographs

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taken of this region graphically illustrate the fact that Watson's Beach proper is the only suitable landing place to beach canoes, while the bay provides the largest break in the rocky coastline in either direction. A low dune face is adjacent to a flat, grassed and slightly boggy area, surrounded by a low ridge. Cultural material is exposed along the length of the bay, within an area of approximately 300 x 20 metres. Eroding features are aligned parallel to the ocean and are situated on or just behind the dune face. Several features are located within large areas of deflated material, and most features seem to be clustered. At various stages during monitoring, dark bands of material have become apparent in different parts of the site, suggesting the potential presence of sealed stratigraphy.

Method

Initial field survey recorded site conditions between June-November 2000 and produced a base map of exposed archaeological material. Monitoring soon revealed a rapid rate of erosion, and additional mapping and monitoring continued in order to capture changes to the site. During each site visit, photographs were taken and additional points mapped when necessary. Site condition and physical characteristics were recorded and written up, including land use, descriptions of area and extent of erosion, condition of archaeological material and integrity of site. Sketches and plans have been produced and several artefacts salvaged. On one occasion test pitting was carried out in conjunction with Chris Jacomb (Southern Regional Archaeologist, Historic Places Trust).

The majority of field survey at Watson's Beach was undertaken using a LaserAce® 300, a hand held Electronic Distance Measurer (EDM), which has recently been purchased by the Anthropology Department, University of Otago. Relatively flat topography and low vegetation cover made Watson's Beach a suitable location for field testing this equipment. We were particularly interested in checking accuracy and efficiency of data collection and technical suitability as a simple, time saving alternative to standard plane table mapping.

The LaserAce® 300 is a hand held machine that incorporates a pulsed laser distance meter, an inclinometer and a digital fluxgate compass with an in built calibration system (Figure 1). The equipment weighs 600 grams in total and can be operated continuously for around five hours on two AA batteries. A visible laser sight allows the measurement of range, bearing and vertical angle. For targets up to 300 metres distant, without additional equipment, readings are of decimetre accuracy. When used in combination with retro-reflectors targets

up to 5 kilometres away can be measured (MDL nd: 7). The LaserAce® 300 is designed for general use and not solely as a piece of surveying equipment. The LaserAce® 300 beam has a 'footprint' or diameter that increases by 40 centimetres every 100 metres. Ideal targets are the same size or larger than this 'footprint' (*ibid*: 14). Potentially, elevation results may vary slightly. However, on a site such as Watson's Beach, with little variation in elevation over large areas, the LaserAce® 300 proved very effective.

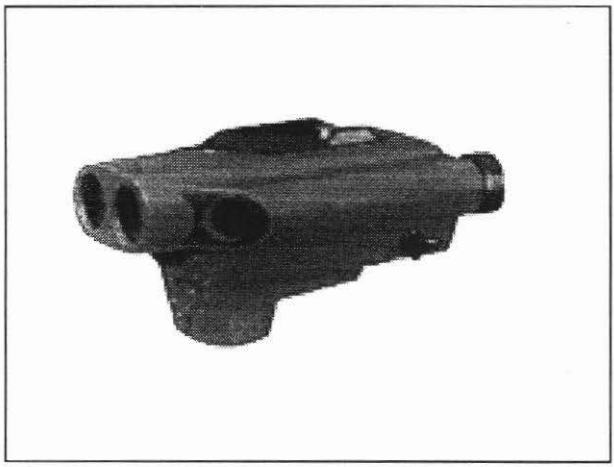

Figure 1. The LaserAce® 300.

The LaserAce® 300 provided a simple way to collect a lot of data quickly, even without previous experience with the equipment. An EDM can produce a quality reading in seconds, allowing a dramatic increase in data collection from the hundred points typically achieved with a theodolite in a single day (Bettess 1992: 73, 118). The simple 'point and shoot' process allowed us to rapidly record hundreds of points and collect several types of data simultaneously (bearing, horizontal distance and elevation). This simultaneous data collection is a significant advantage when compared to the electronic alidades currently used in New Zealand archaeology, which require separate readings to collect each type of data. When mapping with an EDM, an area rather than linear method is used. The instrument is positioned at various stations, which are central to particular areas of interest. An EDM has a much greater range than most other methods of mapping archaeological detail, which means that stations can be more widely spaced at distances limited only by the need to maintain

clear sight lines (*ibid*: 121, 123). Initial mapping at Watson's Beach involved six stations and this number was added to as monitoring continued.

The LaserAce® 300 was particularly accurate for compass bearing and horizontal distance measurements, and was very efficient. When care was taken to avoid introducing error and to calibrate the machine correctly, and batteries were maintained to avoid inaccuracy, results were very satisfactory. Operator error could be easily identified and addressed in the field. However, this is did not do away with the need for a formal mapping procedure and we found it particularly important to take repeated back sights and independent readings of all station points. In addition, standard levelling methods (*ibid*: 44-45) were used to check the elevation of station points.

Site Components and Spatial Distribution

Watson's Beach contains many individual features (ovens, midden scatters and artefact clusters) which provide the potential for a discussion of intra-site spatial distribution. We have produced two maps of the site, representing different erosion phases observed in November 2000 and October 2001 (Figures 2 and 3). These are discussed below as a composite representation of the site (described from South to North – left to right) in order to incorporate temporal elements of erosion and exposure. When describing some site components, we also include labels linked to specific features. These labels (indicated by quotation marks) were supplied by Ken and Margaret Tustin and will provide future material culture studies with spatial data for surface artefacts salvaged from Watson's Beach.

Three ovens are closely associated in the far south of the site. One of these is being carved away by tidal erosion and has suffered structural damage, while the other two remain buried further behind the dune face and are only visible at surface level as dark shadows surrounded by lithic scatters. This area of the site was exposed in August 2001. Nearby, surface shadowing in a shallow blowout indicates the presence of another two ovens. Their condition appears to be relatively stable (Figure 3).

Immediately to the North, the tide has formed two channels either side of a rock outcrop, resulting in particularly destructive erosion (Figures 2 and 3). In September 2001, erosion in the southern tidal channel exposed an oven and associated charcoal and lithics near the edge of the blowout, and an oven on the southern edge of the outcrop itself. In the northern tidal channel on the other edge of the outcrop, three ovens surrounded by obsidian and other worked stone

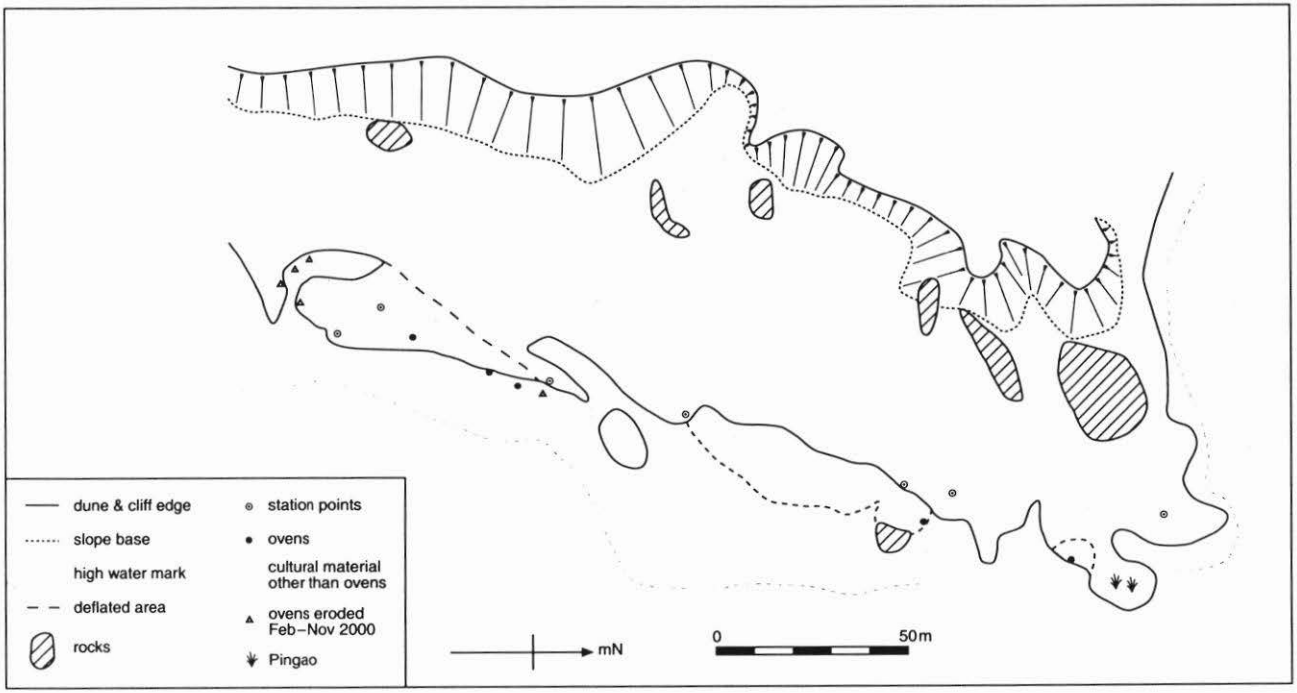

Figure 2. H45/10 November 2000.

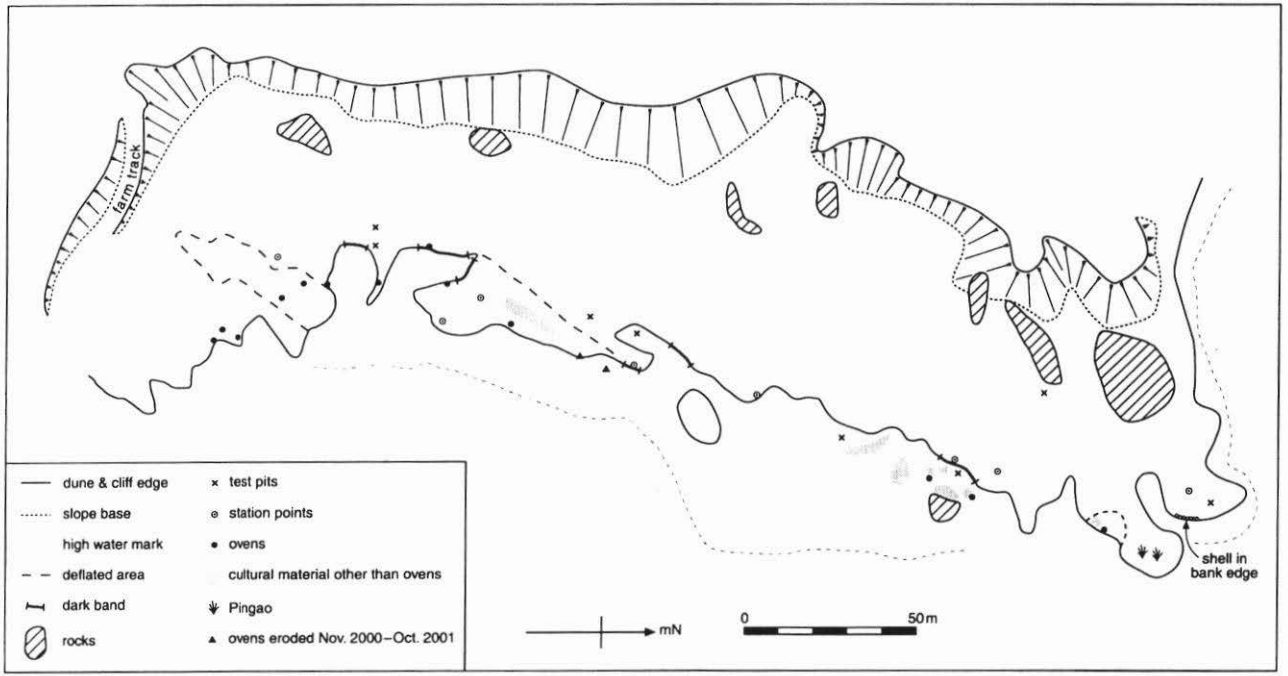

Figure 3. H45/10 October 2001.

were destroyed and removed by tidal action prior to our initial survey (Tustin pers. comm). Between June-November 2000 an oven first observed and recorded in cross-section (Figures 4 and 5) was also destroyed. This oven is referred to in salvage records as "The original umu" (Tustin pers.comm). In September 2001 new ovens were exposed at the base of the channel and on its northern edge. Although test pitting in the area suggested that cultural material is not present further inland, a band of darker coloured sand may be seen at the furthest reaches of both tidal channels (Figure 6).

North of the tidal channels, beside another rock outcrop, several ovens were associated with shell midden and lithic material scattered approximately 10 metres along the deflated dune slope. Initially, remains of three ovens were exposed on the dune edge, but all have since eroded completely – one prior to our fieldwork (Figures 2 and 3). The remaining oven first became exposed in late 2000, and has been gradually weathered down (Figure 7). After ten months it seems to have reached a critical stage in the deterioration process and is eroding at an accelerating rate. Midden inland of this 'line' of ovens contains mussel and paua shell, and fish and bird bone, as well as small pieces of moa bone and lithic material. Surface artefacts salvaged here have been labelled "Southern Midden" (Tustin pers.comm). The midden scatters have been eroding steadily, and material has become exposed, loosened, and dispersed, to reveal the compact greyish sand matrix in which it was embedded. This compact layer has now begun to crack and can be seen to be only several centimetres thick. A test pit inland of this area contained dark soil.

To the north side of the deflated area the dune has retained a relatively stable, grassed top, although this too is eroding substantially in places. Early in the monitoring process this area contained intact stratigraphy (Walter and Tucker 2001: 8) but by June 2001 this seemed to have been destroyed. However, in October 2001 erosion revealed new cultural material, which may indicate that a small amount of sealed stratigraphy remains beneath the grass. This material is threatened by rabbit and penguin burrows, and by the growth of a channel cutting through and behind the dune. Lithic material (including obsidian) has eroded within this channel, and a compact grey sand matrix has recently been exposed. During initial field survey, lithic material from this area was strewn on the dune slope below and around a grassed mound situated at the channel mouth (Figure 2). A test pit from within this channel contained dark soil.

Several discrete areas of cultural material are exposed within a second deflated area to the north of the channel and mound (Figure 2 and 3). Eroded lithic

Figure 4. Oven eroding, June 2000.

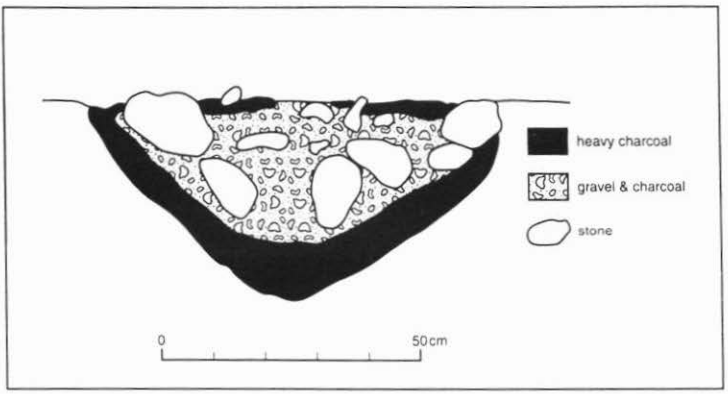

Figure 5. Cross section of the oven pictured above.

material in the "Middle area" is thinly scattered and disturbed, with a more defined "Northern middle midden" further along the dune slope. A test pit in this area contained some debris from oven rake-out. Nearby, the larger "Main midden" is exposed. Like the scatters to the south of the site, the northern middens also consist mainly of mussel and paua shell, with a less obvious bone component. Over the monitoring period, continued erosion and a large rabbit burrow have shown that the "Main midden" is more substantial than other cultural 'layers' at the site. The cohesive nature of this midden has resulted in the temporary preservation of a thick slab of cultural material, despite the erosion of surrounding sands (Figure 8).

Figure 6. Band of dark material, September 2001.

Closely associated with and to the north of the "Main midden", a smaller area of concentrated lithic material lies directly behind an eroding oven. The many surface artefacts salvaged from this lithic concentration have been labelled as eroding from "The Workshop". These include two stone minnow lures with triangular cross-section and bilateral perforation (one lure has a regularly notched distal end, while the other is plain), an adze preform, a drill point, a

large number of obsidian flakes, several other examples of worked silcrete and a series of moa bone tabs (Tustin, pers. comm). Near "The Workshop" lies an eroding oven and an area labelled "The Make-up Room" from which many pieces of ochre and worked stone have been salvaged. The dune edge directly behind these features has been described as "Moa Bone Bank" due to the large sections of moa bone which eroded and were salvaged here prior to our fieldwork (Tustin, pers. comm). In July 2001, a dark band of soil became exposed in this area. A subsequent test pit to investigate the possibility of intact stratigraphy was inconclusive. In September 2001, cultural material also began appearing on a rocky outcrop to the seaward side of this group of features (Figures 2 and 3).

Figure 7. Pedestalled oven, September 2001 (behind eroding midden scatter).

Finally, to the far north of the site beside a disturbed area of cultural material, a single oven is gradually being exposed by the tide (Figures 2 and 3). Nearby, a bank of pingao (*Desmoschoenus spiralis*) grows on the northern most of the dunes. Pingao was highly valued by Maori weavers for its golden colour (Herbert and Oliphant, 1991: 5). The plant (a dune builder and binder) is now rare in most parts of the country, and in September 1996, pingao from this stand

was taken to Moturata Island at Taieri Mouth in a re-vegetation programme (Tustin, pers. comm; Palmer, 1997: 202). Behind the pingao, erosion in a tidal channel has revealed a very thin layer of shell (Figure 3) beneath the grass beside the mouth of Big Creek, which runs into the sea at Watson's Beach. Test pitting inland of these features suggests that cultural material is not present behind the dune. Across Big Creek, on the edge of Watson's Beach proper, a small cave contains mussel shell, but is not necessarily connected to site complex H45/10.

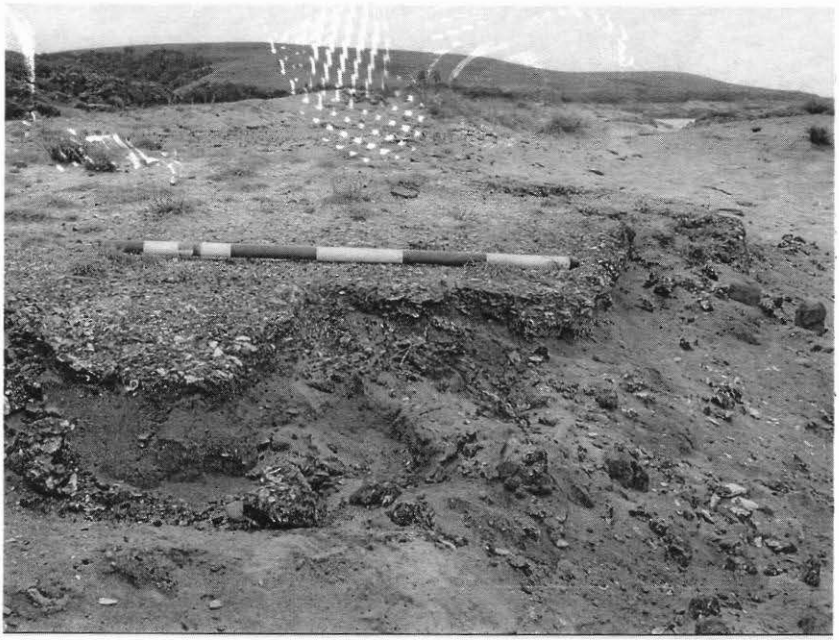

Figure 8. Eroding midden cap, September 2001.

Archaeological Resource Management

As noted above, the site at Watson's Beach was originally recorded in Teal's (1977) *Blackhead to Clutha River Mouth Site Survey* for the Historic Places Trust. In the report, the site (S172/55) is described as "Very slumped and well trampled, blue mussel only", and is located "on edge of north side of grassy point where there is a track used by cattle." The New Zealand Archaeological Association site record form completed for this site is dated 6 March 1984, but

contains information from the 22 January 1977. The form locates the site at the "south end of second bay to south of Watson's Beach" and notes that the midden is eroding, and that "scatters extend for 15m on edge of terrace, before grassy point, mussel only". Teal "measured" the site and photographed a "view of exposure" which is currently unable to be located. This material suggests that the site at Watson's Beach has been eroding over at least a twenty-five year period from a fifteen-metre exposure to the extensive coastal complex visible today.

Comparisons between aerial photographs of the area taken in 1946 and 1997 indicate that both Watson's Beach proper and the bay containing site H45/10 used to be slightly more extensive, with sands reaching further into the sea and around the mouth of Big Creek. Locals recall that 30-35 years ago the site was covered by a dune system large enough to jump from and slide down (Tustin, pers. comm). While most erosion probably occurred on a gradual and continuous basis, 8-10 years ago a series of severe storms stripped most of the remaining dune sand from the bay (Tustin, pers. comm).

Continual erosion and regular cycles of severe degradation are affecting the site at Watson's Beach. The site is open to southerly fronts in bad weather and high tides often cover the sand entirely. The dune marks the unfenced boundary between pasture and coastline. Sheep travel across the site, and until recently cattle had seasonal access. Upon request in the winters of 2000 and 2001, the landowner removed cattle from the paddock that borders the site. Nonetheless, with each high tide archaeological material is exposed along the edge of the dune ridge. In addition to surface destruction, rabbits and penguins continue to create burrows within remaining sealed deposits. Over the monitoring period, areas of exposed cultural material increased and midden and individual ovens became more defined. Several features have been entirely removed and recently an entire section to the south of the site was exposed after stormy weather (as described above). While some parts of the dune face seem to maintain relative stability, this occurs only after the protective layer of sand has been stripped from the area, leaving the more compact archaeological material behind. Cultural remains are thus conflated and exposed to further disturbance and damage. Our monitoring programme leads us to conclude that a significant part of the original site complex probably extended towards the ocean and has already been destroyed. Remaining archaeological material lies on the dune edge and under the dune surface. As the dune face is actively eroding and moving inland, any currently undisturbed material will soon be destroyed.

Conclusion

On the basis of available evidence, Watson's Beach can be tentatively described as an Archaic site. Artefacts such as the minnow lure shanks are characteristic of Archiac sites in Murihiku, and the presence of moa bone needs to be considered further (we have not seen the large portions of moa salvaged, and note the possibility that these may have been 'mined' for fishhook manufacture). While the site may not be a very early one, there is at present no reason to describe it as Classic, and there is no evidence of post-contact material. Until excavation provides further information we suggest the site is characteristic of the late Archaic. People probably used the area as a collection point for paua (divers still harvest these today) and other marine resources, and as a convenient camp at which to break journeys along the coast. Seventeen of the twenty known ovens occur in the southern half of the site. Based on available evidence, tentative interpretation of activity areas could include residential (southern), cooking and processing (central) and tool production (northern) foci in various parts of the site. Alternatively, H45/10 could be the result of many small, successive campsites.

Regular monitoring and mapping has allowed the recording of deteriorating site condition, and continual erosion and emergence of cultural material at Watson's Beach. This temporal dimension makes our maps (Figures 2 and 3) a valuable information resource. Coastal erosion is a serious and ongoing problem for archaeology and cultural resource management in Otago. In 1978 Anderson and others revisited the coastline of North Otago in an assessment of previously recorded sites between Waitaki Mouth and Warrington (Anderson *et al*, 1978). Fifteen of the fifty-two sites had completely eroded, while thirty-two new sites had been exposed. Similarly, Palmer (1994) revisited the area around the Taieri Mouth originally surveyed by Teal (1977). Of twenty-two previously recorded sites, seven had been destroyed, eleven were probably lost and five new middens were located. These studies demonstrate the volatile nature of the Otago coastline over the last forty years, and the trend continues at present. Erosion at Pleasant Mouth and Doctors Point has accelerated recently (Symons pers. comm), while Purakaunui (Barber, 2001: 203) and Watson's Beach are just two of many continuously eroding sites. There is a need for a formal, regular monitoring programme along the Otago/Southland coastline to identify the continuous exposure of new sites and to prevent the loss of information that cannot otherwise be recovered. Additionally, data about the erosion processes observed needs to be built into models of regional archaeology, to provide a context for our understanding of coastal prehistory and to allow a more accurate

interpretation of the archaeological material we have obtained and have still to recover.

Acknowledgements

Information about artefacts from Watson's Beach has been obtained from Ken and Margaret Tustin, who have salvaged material and recorded provenance information, and from the Palmer family (Te Runanga Otakou) who currently hold the collection of salvaged material. We wish to thank Mr and Mrs Shaw for access through their land, the Palmer family for introducing us to the site, Ian Barber, Elaine Marland and Amanda Symons for information, the Otago Regional Council for access to aerial photographs, Chris Jacomb for letting us tag along during test pitting, Heather Sadler for technical support, Les O'Neil for the illustrations, Peter Tucker for transport, Ken and Margaret Tustin for their generosity with information and encouragement, and Dr. Richard Walter for his support, encouragement and proof reading and for starting us on this project.

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