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MOTUIHE ARCHAEOLOGICAL LANDSCAPE AND RECENT INVESTIGATIONS

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Introduction

Motuihe, in the inner Hauraki Gulf, is a 178ha island reserve owned by the Crown and administered by the Department of Conservation (DOC; Figures 1 and 2). It was occupied from the time of early Polynesian settlement in the Hauraki Gulf and, as with Browns Island and Motutapu, was one of the first European land purchases in the Auckland Region. The northwest headland has seen a varied history including use as a quarantine facility, prisoner of war (POW) camp, children's health camp, and a naval training facility.

The island is gazetted as a Recreation Reserve, and is presently the focus of a native revegetation programme. Its proximity to Auckland, and sheltered anchorages either side of the north-western isthmus, make Motuihe a popular destination for Auckland's boating public. A wharf on the southern side of the headland provides easy access.

Until recently management of the island as an open space reserve required concessionaire farming of the island. Year-round heavy stock grazing, combined with rabbit burrowing has resulted in degradation of the upper soil layers over the most part of the island with the exception being areas protected from stock by the coastal perimeter fence.

Historic Background

Motuihe was settled during pre-European times, and pa were constructed there at Te Rae-o-kahu, Mango-pare-rua and Te Tumurae. The bay formed by the headland isthmus and west coast of the island, known as Wai-hao-rangatahi, and Mango-pare-rua are both remembered as important battle sites. The traditional history of the island was provided by George Graham in 1931.

Formerly a Maruiwi tribal home. About 1200 AD they were conquered by Te Tini-o-Toi, that people being in possession when “Arawa” canoe people arrive 1325 AD. Kahumatamomoe naming various localities after self & the island itself he named “Te Motu-o-Ihenga” - (a nephew of his) & this is said to be original form of name. Huarere, a brother of Ihenga was the founder of the Arawa sub-tribe Ngati-Huarere who dispersed the Tini-o-Toi. Later in warfare with the Tainui tribes (the Marutuahu) the Ngati-Huarere were displaced by Ngati-Paoa. This later people held these islands until European times (despite much warfare with Ngati-Whatua of Tamaki & Ngapuhi under Hongi Hika & others) - & were the vendors as recognised owners to the Crown.

(NP 26, 27 August 1931 cited in Brassey 2000)

There are a number of Maori place names on Motuihe that have their origins in traditional accounts of the island’s history, and the island was renowned for its kumara cultivations. No evidence of the gardening soils has been recorded but numerous storage pits are clustered on the ridge and knolls at the southern end of the island.

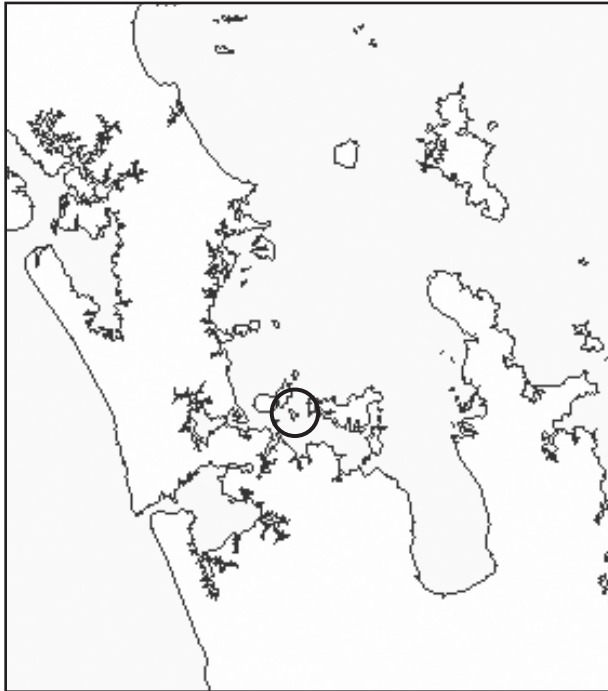


Figure 1: The Auckland region, showing Motuihe Island.

Following an initial purchase in 1837, William Brown and John Logan Campbell bought the island from Henry Tayler in 1843. A farm manager named Fedarb was established on the island, but it is unclear from his diaries where he lived. Farming was intensified from 1858 when the island was owned by John Graham who employed four men to manage his farming operations there until his death in 1868 (Brassey 2000).

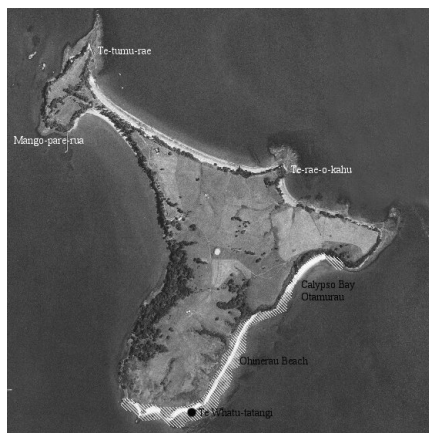


Figure 2: Motuihe Island, showing the location of pa sites and principle stone working areas along the southeast coast. Te Whatu-tatangi refers to a rock offshore and is also the location of the adze quarry.

Following an edict by Governor Grey in 1864 requiring Health Boards and Port Boards to establish quarantine facilities, stations were established at each of the four main centres. Similar facilities were established on Somes Island in Wellington Harbour, Quail and Ripapa Islands in Lyttelton Harbour, and St Martins and Goat Islands in Otago Harbour, although by 1908 the primary animal quarantine facility had become Somes Island. In 1872 the headland of Motuihe was selected by the Board of Health of the Port of Auckland as the site for a human quarantine station, and buildings were erected shortly after using buildings and materials from the demolition of the Albert Barracks (NZ Gazette 1873:429; Maddock 1966:43). The first vessel to be quarantined was the *Dorrette* which arrived in April 1874, and the first burial interred in the cemetery was a girl named Mary Long who arrived on the *Hydaspes* later that same year (NZ Herald 16/04/1874:2/2; Dickens & Dickens 1982). The mainland portion of Motuihe was administered for animal quarantine after the Department of Agriculture was formed in 1892.

From 1914 the barracks on the headland were used as a POW internment camp, mostly for German and Austrian nationals and Samoan prisoners (Walsh

1937: 9-10). Notable other prisoners included the German captain Count Felix Von Luckner, who managed to escape as far as the Kermadec Islands before being recaptured in 1917. The same network of quarantine facilities doubled as POW camps with Von Luckner being imprisoned on Ripapa Island for six months following his recapture, and his crew being imprisoned separately on Somes Island (Bade 2006). The POW camp was closed down in December 1918, with the remaining prisoners transferred to Narrow Neck Camp.

The quarantine operation was resumed shortly thereafter and the 1918 influenza epidemic accounts for several of the gravestones in the cemetery. From 1929 to 1931 the Community Sunshine Association ran children's health camps on the island. All animal quarantine had been diverted to Somes Island by 1930, and the human quarantine operation eventually closed in 1941 when the Navy took permanent control of the island. The HMNZS Tamaki naval training base was commissioned on 20 January 1941, and the quarantine station refitted with new buildings and equipment (Grattan 1948: 618-9). For the Navy, HMNZS Tamaki was the primary training base in New Zealand. Over 6000 recruits were trained there between 1941-1945, representing approximately 60% of all Navy recruits who saw active service in World War II. With the Royal New Zealand Navy still in its infancy, the majority of trainees were drafted to Britain to serve on Royal Navy ships. While the gun was never used offensively, Motuihe also played a minor role in the coastal defences of the Hauraki Gulf with the 4" guns protecting the channel between Waiheke and Motuihe. The HMNZS Tamaki was closed in 1963 when naval training operations were combined with army training and relocated to Narrow Neck.

The present day landscape

Of the three pa documented on the island, Te Rae-o-kahu (R11/151) is a substantial pa site divided in two by an internal ditch and a total defended area of 4500m². Mango-pare-rua (R11/148) was a small headland refuge pa covering approximately 600m² with a single transverse ditch and bank. Little evidence remains of the Te Tumurae pa (R11/149), but a ditch is faintly visible in a 1930 aerial. With the exception of Mango-pare-rua, construction of the quarantine station and naval training base has removed almost all traces of Maori occupation on the headland.

There are 53 other recorded sites on this end of the island relating to Maori settlement and occupation. These include middens, pits, and terraces, and complexes of different site types. There are likely to be a significant number of unrecorded sites, including now mostly indistinct pit/terrace sites. Many Maori sites in the interior of the island have probably been damaged or destroyed by European farming practices and rabbit burrowing.

Initial construction of the quarantine station in 1870 used relocated buildings from the Albert Barracks, and eventually included several other accommodation buildings along with hospital wards, stables, a caretaker's house, and a fumigation building, mostly around the central avenue. By 1941 the facility contained 22 buildings, and was able to accommodate up to 287 internees. The associated olive grove contains some of the earliest olives planted in New Zealand, most likely from some of Logan Campbell's early introduction of the plant in the 1870s. While never formally gazetted the cemetery received its first burial in 1874, although most of the markers relate to victims of the 1918 influenza epidemic. Other relict features from the quarantine station include the various pathways, archaeological deposits and numerous exotic trees and shrubs.

Following the establishment of the HMNZS Tamaki naval training base in 1941, the former quarantine station was converted at a cost of £53,350, requiring an additional 15 new buildings and almost doubling its accommodation capacity to 517. In 1942 two 4" Mk IX guns were mounted on the island, one at Cemetery Point on the headland and the other on the isthmus. The guns were mounted on circular concrete pads with ammunition recesses to the rear. The gun on the headland was dismantled in 1942, and the gun on the isthmus was retained until 1963 for training purposes. Following their abandonment of the headland the Navy stripped the buildings, rendering them unusable, and they were subsequently demolished by the Auckland City Council, leaving only the water tower and the nearby Ministry Of Works workshop, the Navy surgeon's cottage (later used by the sea cadets), wharf shed and the concrete foundations for the wharf. Other relict features include the rifle trenches to the east of the parade ground and concrete foundations for an assembly point flagstaff.

Archaeological recording and investigation

Archaeological site recording on Motuihe started with the recording of the three pa by Janet Davidson in 1963. These records were upgraded with site plans in 1973 by the Auckland University Archaeological Society. In 1979 Bruce Hayward recorded an additional 23 sites (Hayward 1980). Prior to the eradication of rabbits, while the grass cover was at a minimum Robert Brassey recorded a further 28 sites between 1996 and 1997 including the sites associated with early farming, quarantine facilities and coast defence sites (Figure 3, Table 1). A complete upgrade of archaeological information was carried out in 2003 prior to the development of an ecological restoration plan being developed, and to meet the requirements of the NZAA site recording scheme upgrade (Dodd 2003). In 2004 an inventory of heritage trees was undertaken by DOC, focusing on the headland and isthmus, but also including many

notable specimens on the southeast portion of the island including the world’s southern-most Scots pine (Dodd 2004). In 2006 an assessment of significance carried out by the Auckland City Council as part of their Inner Gulf Islands Archaeological Assessment, and information was incorporated into their GIS. In 2007 following their exposure the extensive flaking floors and quarry sites along the southern and eastern coasts were recorded.



Figure 3: Location of recorded archaeological sites.

R11/148	PA
R11/877	MIDDEN
R11/1892	TERRACE
R11/149	OCCUPATION
R11/878	MIDDEN
R11/1893	PIT/TERRACE
R11/150	MIDDEN

R11/879	MIDDEN
R11/1894	MIDDEN
R11/151	PA
R11/880	PIT
R11/1897	PIT
R11/152	MIDDEN
R11/881	PIT
R11/1898	FINDSPOT
R11/153	MIDDEN
R11/882	MIDDEN
R11/1899	MIDDEN
R11/154	MIDDEN/WORKING AREA
R11/883	PIT
R11/1900	TERRACE
R11/155	PIT/TERRACE/MIDDEN
R11/884	MIDDEN
R11/1901	MILITARY TRENCHES
R11/156	PIT
R11/885	MIDDEN
R11/1902	TERRACE/MIDDEN
R11/157	PIT/TERRACE/MIDDEN
R11/886	TERRACE/MIDDEN
R11/1903	HOLE (?DUGOUT)
R11/158	PIT/TERRACE/MIDDEN
R11/901	MIDDEN
R11/1904	MIDDEN
R11/159	PIT/TERRACE/MIDDEN
R11/1295	MIDDEN/PIT
R11/1905	TERRACE/MIDDEN
R11/160	PIT/TERRACE
R11/1697	PIT
R11/1906	TERRACE/MIDDEN

R11/865	PIT/TERRACE/MIDDEN
R11/1784	QUARANTINE STATION
R11/1907	TERRACE/MIDDEN
R11/866	PIT/MIDDEN
R11/1880	BURIAL/MIDDEN
R11/1908	PIT/TERRACE/MIDDEN
R11/867	MIDDEN
R11/1881	GUN EMPLACEMENT
R11/1909	BURIAL
R11/868	MIDDEN
R11/1882	OVEN/FINDSPOT
R11/1961	?TERRACE
R11/869	MIDDEN
R11/1883	TERRACE/MIDDEN
R11/1962	PIT
R11/870	MIDDEN
R11/1884	PIT/TERRACE/MIDDEN
R11/2233	MIDDEN
R11/871	MIDDEN
R11/1885	COTTAGE SITE
R11/2271	CONCRETE PADS/ETC
R11/872	MIDDEN/WORKING AREA
R11/1887	WELL/RESERVOIR
R11/2327	MIDDEN
R11/873	MIDDEN
R11/1888	RESERVOIR
R11/2439	JETTY
R11/874	MIDDEN
R11/1889	TERRACE/MIDDEN
R11/2437	ADZE WORKING AREA
R11/875	MIDDEN
R11/1890	TERRACE/MIDDEN

R11/2438	STONE WORKING AREA
R11/876	PIT/TERRACE/MIDDEN
R11/1891	MIDDEN

Table 1: Archaeological sites recorded on Motuihe Island.

Recent Investigations: Stone tool assemblage

A number of surface collections have been undertaken by local residents and visitors to the island, and these were reported for the first time in 2006. While the majority were collected from the intertidal zone of Calypso Bay (R11/2438), the adze shown in Figure 4 was found at the south end of South East Beach (R11/872) and other adzes were found at the south end of Ohinerau Beach (R11/1890). The collections comprise 27 adze preforms, 16 finished adzes and 224 flakes and other debitage. These are discussed below.

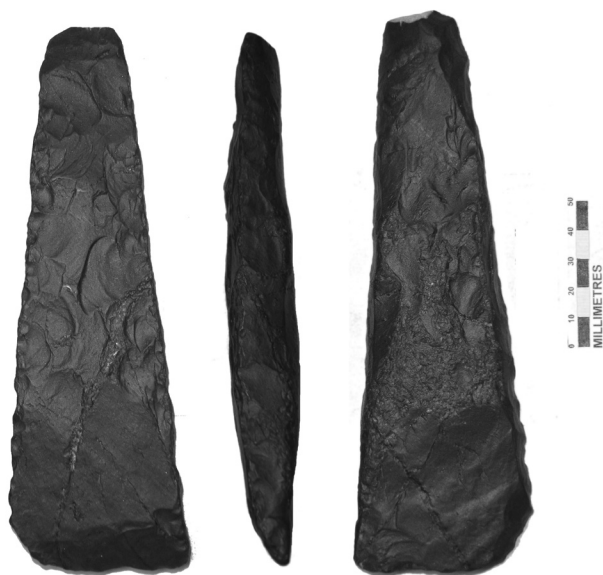


Figure 4: Type 2 Nelson argillite adze found at South East Beach, Motuihe Island.

Stone material

All but one preform, two adzes and one flake are made from a local flakeable sedimentary rock commonly referred to as ‘Motutapu greywacke’.

Motutapu Island has large concentrations of this material and much evidence for prehistoric exploitation (Turner 2000). Evidence for the working of the same type of stone has also been recorded on Rakino Island and on Motuihe itself (see Figure 5, showing worked beach boulders).



Figure 5: Greywacke quarry near Te Whata-tatangi (R11/2437).

While commonly very fine-grained, there is considerable variety in grain size among the artefacts from Motuihe, though all the greywacke is obviously flakeable. Among the preforms and flakes a range of parent material forms is also apparent. These include both terrestrial and inter-tidal sources as indicated by cortical remnants on the artefacts. Angular chunks and flakes spalled off boulders like those in Figure 5 are indicated, as well as rounded water-rolled cobbles that were split in half to make two blanks.

Two other stone materials are present in these collections. One adze and one flake were identified as basalt, very likely from the large well-known quarry at Tahanga on the Coromandel East Coast. Two other artefacts are made of Nelson/Marlborough argillite, probably the D'Urville Island source. From replication experimentation in the manufacture and use of adzes made in Tahanga basalt and Nelson/Marlborough argillite, the superiority of these materials compared to Motutapu greywacke was clear. While Motutapu greywacke is very hard and thus can take a very sharp cutting edge, it lacks

the toughness of the basalt and argillite and this limits the types and sizes of adzes that could be made from it (Turner 1992, 2000).

Preforms

The 27 preforms are in various stages of manufacture. The only one that is complete and ready for hammer dressing and grinding is one of the imported adzes made of Nelson/Marlborough argillite. From observations made on other Hauraki Gulf islands and elsewhere in New Zealand (Turner 2000), it is not uncommon for adzes to be distributed from the adze production zone in an unfinished state once the risky stage of flaking is completed. Like the Motuihe find, they are generally well formed and often require little more than grinding to make them operational. Why this adze was not finished is unclear due to the lack of contextual information.

All the other preforms are made of the locally available greywacke. Over half are at an early stage where adze shape is not well defined, and none of the preforms are ready for the finishing stages of hammer dressing and grinding. Breakage was the main reason for rejection. But in many cases discard only took place after attempts had been made to reshape the piece into a smaller preform if the piece was long enough. When pieces were too small or if they broke again during reworking, they were frequently re-used for some other purpose. Common re-uses seen in the Motuihe preform collection include crushing and pounding – often utilizing the poll on broken butt pieces. Among the preforms (compared to finished adzes), re-use is particularly common but this may reflect a difference between what was discarded at the site and what was removed from this context. Most of the broken pieces are truncated butt pieces representing a third or less of the original preform length (a number of pieces could not be identified due to subsequent use-wear). Bevel pieces are uncommon. From reworking experiments bevel pieces were found to be much easier to rework into smaller adzes (Turner 2000). The ‘missing’ bevel pieces in this collection, then, may have been successfully reworked into smaller adzes and removed from the manufacturing/workshop context.

Adzes

Only one of the finished adzes was close to its primary condition. This was a complete Nelson/Marlborough argillite adze but it too had seen episodes of blade repair. This is a common observation made of early New Zealand adze collections in general. In a study of almost 12,000 adzes, less than 10% were in primary condition (Turner 2000).

Only five other Motuihe adzes were unbroken. Three were scrappy small flake adzes referred to as ‘expedient’. Unlike other adzes, these were quickly

and easily made from waste flakes, used and then discarded shortly after. They are most commonly found in source areas where adzes were made, such as the island under study here, as this process generated many waste flakes of a size and shape suitable to use for this purpose. The two other complete adzes have suffered bad blade damage and attempts to repair this by reflaking have failed. The repair of blade damage by flaking is a protracted activity requiring high levels of skill and a high risk of breakage (end shock). But without reflaking, or if reflaking fails as in these cases, then there are few other repair options. Hammer dressing close to the blade is dangerous and the regrinding of such hard materials is not viable. One of these adzes had already seen episodes of reworking and repair.

All the remaining adzes are broken pieces. In contrast to the preforms, there is more of an emphasis on reworking broken pieces into smaller adzes rather than re-using them for other purposes. This appears to be the case even though a similar situation exists with a dominance of broken butt pieces representing a third or less of the original adze length. A probable explanation for this is that the finished adze pieces are more finely formed and thus would require less work to turn into another adze. But the dominance of butt pieces is consistent with the preform data in indicating that reworking of these was generally more difficult than for bevel pieces.

Adze Functional Types

The types of adzes and preforms in this collection are representative of the range of adzes found in early New Zealand wood working kits (Table 2; see Turner 2004). Type 1 (wide bladed) and Type 4 (narrow blade) were the large chopping and roughing out adzes designed for heavy work while Type 2 adzes were used for finer finishing and timber dressing. Type 3 adzes were used for shaping curved surfaces and smaller gouges and chisels (Type 6) for making grooves and perforations and for carving. Missing from the collection is the uncommon Type 5 adze designed for work in confined spaces, such as those within the narrow depths of early canoe one-piece hulls. From analysis of the large New Zealand adze sample discussed above, it was apparent that once Type 5 adzes were broken or damaged, reworking and modification quickly disguised their original form (Turner 2004), and this could well explain their absence here.

Adze Type	Preform	Adze	Total
One	0	2	2
Two	18	8	26
Three	1	1	2
Four	6	5	11
Five	0	0	0
Six	2	0	2
Total	27	16	45
State			
Primary	1	2	3
Repaired	0	2	2
Failed rework	3	4	6
Reworked	0	2	2
Reused	14	2	16
unidentified/broken	9	1	11
Expedient	0	3	3

Table 2: Motuihe adze and performs functional type and state.

Type 2 adzes are overwhelmingly dominant among both finished and unfinished adzes, followed by Type 4. This result is consistent with observations made of Motutapu greywacke adzes in the large New Zealand sample discussed above, and with replication experimental results (Turner 2000, 2004). Hardness is a valued quality for Type 2 adzes in order to cut smoothly and finely but as they are not used with excessive force toughness is not as high a priority as it is for some other types. In contrast the large heavy wide-bladed Type 1 adzes were found to be very rare in Motutapu greywacke. Motutapu greywacke would not have been strong enough to be used with the type of force required for the tasks these adzes were put to. Most of the Type 1 adzes in the Tamaki and Hauraki Gulf area were made from Tahanga basalt and Nelson/Marlborough argillite. It is thus not surprising that the one definite Type 1 adze identified in this collection was made of Tahanga basalt.

Type 4 adzes are the second most common form in Motutapu greywacke. Again this is consistent with results for the New Zealand sample. While Type 4 adzes are used with considerable force, the design is a robust and sturdy one;

they are thicker than they are wide with a very steep bevel and narrow blade and thus were able to be rendered in relatively inferior local stones, including Motutapu greywacke.

Flakes and other debitage

Because this material was collected from the inter-tidal area with an unknown, or without, a sampling strategy, it is biased to larger pieces and flakes and those that have more interesting features such as use-wear and cortex. This limits their value for analysis. It is evident, however, that this debitage represents a range of activities (similar to the evidence in the preforms and adze data) including adze manufacture, repair and reworking. It is evident that waste flakes from these processes as well as primary blanks were used for a range of other tasks including pounding, crushing, sawing (bone artefacts), drilling and reaming (points).

In 2007 a track cutting undertaken by the Motuihe Restoration Trust destroyed a small midden (R11/152) to the east of the pa in Snapper Bay (Dodd 2007a). The remains of the site were investigated and grab sample was collected from the partially deflated deposits beneath the track providing a C14 date of 1410-1640AD. The sample was predominantly catseye (46%) with pipi (12.4%) and mussel (11.9%). Other species present included cockle, oyster, whelk, nerita, limpet, slipper shell and mudsnail (Dodd 2007b).

Lab no.	Material	$\delta^{13}\text{C}\text{‰}$	CRA yr BP	Cal AD 68%	Cal AD 95%
W k - 21400	Shell	1.2 \pm 0.2	814 \pm 33 BP	1440-1540 AD	1410-1640 AD

Table 3: Radiocarbon date information.

Management of the Motuihe archaeological landscape

The combined factors of poor draining soils, heavy stocking, and burrowing animals have had a damaging effect on the Motuihe archaeological landscape on the mainland part of the island, and the demolition and levelling of the HMNZS Tamaki buildings has resulted in the loss of much of the archaeology on the headland. With the exception of the sites protected from stocking damage outside the coastal perimeter fence, or deliberately excluded from stocking to protect archaeological features or bush remnants, there are few sites that have not been heavily modified. Much of the island is currently in rank pasture in preparation for native tree planting which makes the recorded sites difficult to identify on the basis of their surface features. Archaeological sites are being

excluded from planting, but with the exception of a few prominent sites, it is unlikely that they will be maintained in open space over the long term.

Work specifications were completed for the remaining military structures, HMNZS Tamaki water tower, cemetery and wharf shed in 2001 (Salmond Reed Architects 2001a-d). Plans for managing the vegetation on the Te-rae-o-kahu pa and more prominent pit and terrace clusters towards the southern end of the island have been written up, as well as for the removal of pines from the Mango-parerua pa, but this work is still outstanding. It is hoped that the adze quarry, and working floors can be scheduled for protection in the regional coastal plan.

Discussion and Conclusion

Until recently the presence of a local quarry source at the southern end of the island, and intertidal flaking areas along the eastern coastline at Calypso Bay were not known. Stone working was recorded at Ohinerau Beach, and in the southern bays, but it had not been confirmed that stone procured from Motuihe was being exploited, or that archaic occupation was present. One possible reason for this is related to the dynamic nature of the intertidal area. The intertidal flaking floors are intermittently exposed and concealed as sand is deposited and scoured from the reef shelves. The extensive intertidal flaking site at Calypso Bay (R11/2438), for example, was clearly visible in 2006 but during a recent visit in August 2008 had been almost completely obscured beneath accumulated sand.

While the majority of material appears to have been sourced from the Hauraki Gulf, artefacts manufactured from Tahanga basalt and Nelson/Marlborough argillite was also used. The inter-tidal flaking floors are very similar to those recorded on Motutapu at Administration Bay, Pig Bay, Mullet Bay, Emu Bay, and Otahuhu Point. The assemblages and the quarry site on the island together demonstrate both primary manufacture and reworking of adzes and stone material sourced further afield.

The technology employed and the types of adzes and preforms observed are characteristic of the early period of Maori settlement (otherwise known as 'archaic' – 1250-1500 A.D.). The presence of 'archaic' sites on Motuihe could previously have been inferred from the presence of sites of a similar period on nearby Motutapu, Browns Island, Waiheke and Rakino, but can now be attributed to Motuihe with more certainty.

The artefact collection was unfortunately undertaken in such a way that material could not be ascribed to a more specific context beyond that of the general site location. However, with much of the material occurring in the inter-tidal area, and being subject to water-rolling and the scrambling effect of

wave action, the ability to ascribe additional contextual information may have been limited, even if the artefacts had been collected more systematically. In spite of this, the state of the preforms and adzes provide some insights into their context.

Complete adzes and preforms probably would have been stored carefully in a house or storage area due to their value. Manufacturing preforms and repairing and reworking damaged and broken adzes are tasks that require skill, concentration and considerable periods of time. Such tasks, therefore, are most likely to be undertaken at permanent or semi-permanent villages, probably the workshop area. When manufacture and reworking failed and/or after the piece was re-used for some other purpose, it is likely the tool was discarded in this context, as were the expedient flake adzes after use. Preforms that were still viable, and adzes that had been reworked and repaired successfully were removed from this context and stored elsewhere, probably in the house, for future use. The re-use of many preform and a few adze pieces also suggests a range of other activities were taking place at sites there.

Adzes were manufactured at these sites by the Motuihe Island inhabitants, like their counterparts living on Waiheke, Motutapu and other Gulf Islands and around the Tamaki River and mainland coastal areas near the Waitemata harbour mouth (Turner 2000: 351-361). Motutapu greywacke adzes have been found from the top of the Northland region to the eastern Bay of Plenty (Turner 2000), thus the Motuihe Island inhabitants may also have been involved in the trade and exchange of Motutapu greywacke adzes to people in these places.

Intensive development of the headland during the historic period has resulted in the near complete destruction of at least one site associated with Maori settlement (R11/159), and it is likely that Maori occupation of this area was considerably more extensive than what has been recorded to date. More recent overstocking during wet months combined with the effects of burrowing animals has also resulted in damage and loss to the archaeological landscape in areas not protected by stock exclusion fences or by virtue of being located in the coastal margin.

At present the lack of dates from a variety of sites around the island, and assemblages more accurately provenanced to archaeological context limits further discussion.

Acknowledgements

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