

Stone Tools of the Mackenzie Basin Moa-hunters, South Canterbury

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Analysis of small artefact assemblages from archaeological sites in the Mackenzie Basin, inland South Canterbury, inferred to be associated with early moa-hunters, reveals that the main stone tools utilised by them were flakes and blades of silcrete and slate knives (ulu), supplemented by porcellanite flakes and items made from local rock types. Adzes of basalt and greywacke were also being used at some sites. Silcrete was probably obtained from the local Grays Hills quarry and porcellanite from the Bremner quarry in Central Otago. Other artefacts and lithic materials were undoubtedly transported from the east coast, via the Waitaki River valley, indicating the moa-hunters probably came from semi-permanent coastal occupation sites in South Canterbury and/or North Otago. Previous radiocarbon dates indicate moa-hunting was carried out within the basin in the fourteenth to fifteenth century.

Keywords: archaeological sites, Canterbury, lithic materials, Mackenzie Basin, moa-hunters, stone tools

Introduction

Much of what has been written about the prehistory of the Canterbury region has been based upon the archaeological investigation of large Māori (or moa-hunter) occupation sites along the coast, such as Redcliffs and Rakaia, and the study of their distinctive artefact assemblages (Duff 1956; Challis 1995; Moore 2022). By comparison, remote inland areas have been largely overlooked, particularly in regard to the range of artefacts and lithic materials utilised by early moa-hunters. These items not only inform us about the tool kit being used by these people, but may also provide important clues as to where they travelled from and their wider connections.

In 1968–1969, an extensive field survey of the Lake Pukaki area in the Mackenzie Basin was undertaken, prior to the impending completion of the Pukaki hydro-electric scheme (Trotter 1969; see also Trotter and McCulloch 1999). Altogether, 10 definite pre-European archaeological sites were located, six of which contained stone artefacts. A subsequent survey of the Lake Tekapo area was carried out in 1970 (Trotter 1970a), during which 11 new sites were recorded, although few of these yielded any artefacts. Since then, the only work of any note has been a field inspection of the upper Ahuriri River valley, in the southern part of the basin (Bristow et al. 1990; McGovern-Wilson and Bristow 1991). Some new information has also been obtained on the Grays Hills silcrete source (Moore et al. 2020).

This paper provides a brief account of the taonga (stone artefacts) and lithic materials used by moa-hunters in the Mackenzie Basin and at a rock shelter site (Shepherds Creek) in the nearby Waitaki gorge. Although all of the artefacts found during the Lakes Pukaki and Tekapo surveys and the excavations at Shepherds Creek were lodged with Canterbury Museum at the time, they have not been previously studied in any detail.

Archaeological Sites

The locations of the archaeological sites considered here are shown on Figure 1, and the sites, along with the main types of stone materials recorded, are listed in Table 1. Of the 12 sites, two are classified as oven sites, one as an oven/artefact site, three as camp sites, one as an oven/midden, three as artefact finds and two as rock shelters (www.archsite.org.nz). The largest is Killermont No.2 (site H39/19), near Ōmarama, which is at least 160 m by 25 m in area (Bristow et al. 1990). The largest artefact collection (63 items) is from the Shepherds Creek rock shelter H39/18 in the Waitaki gorge (Table 2). Site numbers are those of the New Zealand Archaeological Association Site Recording Scheme (www.archsite.org.nz).

The Shepherds Creek shelter was situated on the western side of the Waitaki gorge (now flooded by Lake Benmore). It was excavated by Duff and Trotter in 1958, and subsequently by Scarlett and others in 1964, though there does not appear to be any account of the later dig. Drawings on the wall of the shelter were fully documented by Ambrose (1970), but there is only a brief mention of the stone material recovered (in Trotter 1970b: 449).

Although all sites in the Mackenzie Basin are considered to have been associated with moa-hunting (Challis 1995), moa bone is in fact sparse and was only recorded at two of the sites – Killermont No.2 and Boltons Gully (H37/1). At Killermont No.2 the predominant species was the Stout-legged Moa *Euryapterix geranoides*, but included single bones tentatively identified as *Emeus crassus* and *Pachyornis elephantopus* (Challis 1995, identifications by Trevor Worthy). The bones from Boltons Gully were apparently not identifiable. Moa gizzard stones are also rare, being recorded only from Avon Burn (McGovern-Wilson and Bristow 1991). The scarcity of moa bones in the area was noted by Chapman (1884: 174) more than 130 years ago.

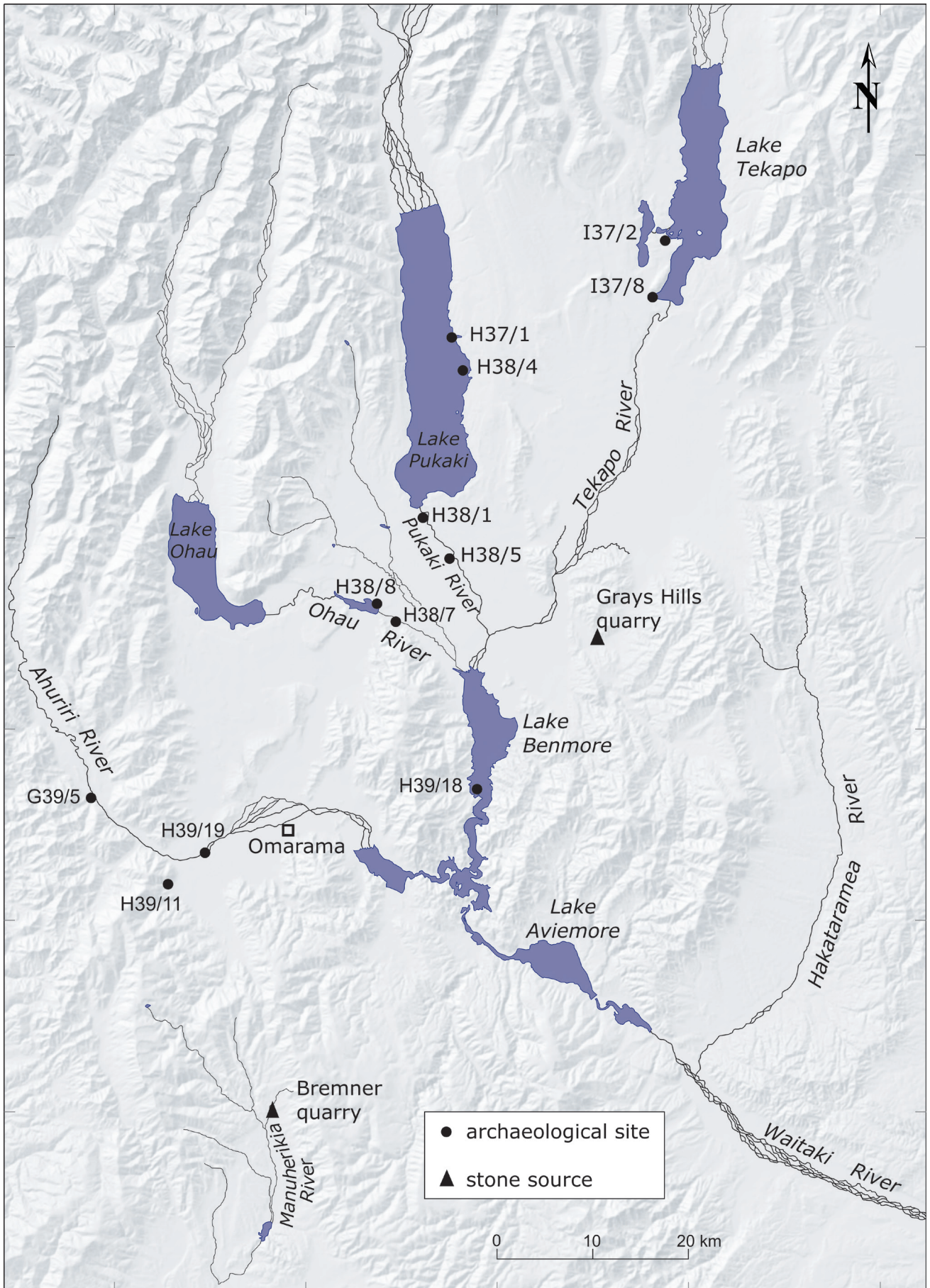


Figure 1. Map of the Mackenzie Basin area, showing the location of archaeological sites referred to in this paper, including important stone sources.

Table 1. List of artefacts/stone materials from archaeological sites in the Mackenzie Basin (imperial site numbers in brackets)

Site	Site type	Silcrete	Porcellanite	Slate	Other
Lake Tekapo					
I37/2 (S90/2)	Artefact find	1		1	Sandstone
I37/8 (S100/7)	Oven			1	Greywacke
Lake Pukaki					
H37/1 (S100/5), Boltons Gully	Oven				Red argillite
H38/4 (S100/4)	Rock shelter	1			
Pukaki River					
H38/1 (S100/1)	Camp site	13 (147g)			
H38/5 (S100/6)	Artefact/camp	18 (118g)			Argillite, adze
Ōhau River					
H38/7 (S109/14)	Camp site	17 (176g)	6 (15g)	1	Red argillite
H38/8 (S109/15)	Oven/midden†	?		1	Shell
Ōmarama					
H39/11 (S116/2), Killermont No.1*	Oven/arteifact	X			
H39/19 (S116/26), Killermont No.2*	Camp site	X	X	X	Adze flakes, red argillite
Avon Burn					
G39/5 (S108/1)*	Artefact find	c.12			Chert, red argillite
Shepherds Creek					
H39/18 (S109/5)	Rock shelter	19	2		See Table 2

* Data from Bristow et al. (1990) and McGovern-Wilson & Bristow (1991).

† Originally recorded as a camp site

X = present

Table 2. Stone artefacts from the Shepherds Creek site H39/18, Waitaki gorge. Canterbury Museum 2008.1115.9, 2008.1115.35

Lithology	No.	Description
Silcrete	19	Flakes, pieces, 1 core
Chert	30	Flakes, pieces, 2 cores
Chalcedony	3	Flakes
Porcellanite	2	Flakes
Greywacke	2	Flake off polished adze, worked cobble
Obsidian	2	Flakes
Pounamu	2	1 piece sawn
Basalt	1	Piece off polished adze
Dolerite	1	Flake off adze
Kokowai	1	Pebble-sized piece (44 g) 2008.1115.30

Dating

Radiocarbon dates have been previously obtained for Boltons Gully (H37/1) and Killermont No.2 (Challis 1995). The single Boltons Gully date (NZ1378) was on unidentified charcoal, which provided a conventional age of 505 ± 44 years BP. This was re-calibrated using Calib v8.2 (Stuiver and Reimer 1993; calib.org/calib) and the latest terrestrial calibration curve SHCal20 (Hogg et al. 2020), giving a date of AD 1399–1500 at 95% confidence, or AD 1417–1456 at 68% confidence. Thus the site was probably occupied in the early to mid fifteenth century, assuming no significant inbuilt age for the charcoal.

Three dates were obtained for Killermont No.2, all on charcoal from short-lived species (Challis 1995, Appendix 3). Two of these (Wk2782, 2916) are virtually identical, with conventional ages of 640 ± 35 BP and 620 ± 45 BP. These provide re-calibrated dates (using SHCal20) of AD 1297–1413 at 95% confidence (or 1319–1401 at 68% confidence) and AD 1298–1434 at 95% confidence (or 1320–1413 at 68% confidence) respectively. Wk2991 has a conventional age of 590 ± 45 BP and calibrates to AD 1315–1448 at 95% confidence (or 1326–1430 at 68% confidence). Combined, the three dates from this site indicate that it was occupied in the mid to late fourteenth century.



Figure 2. Silcrete blades from the Killermont No.1 site. Otago Museum D67.144-146. Photo by Anne Harlow

Rock Types and Artefacts

Artefacts were examined in hand specimen and under a binocular microscope. Colours were established with reference to the Munsell Soil Color Chart (2000 version).

Silcrete

Many of the sites contained flakes of fine-grained silcrete (Table 1). These typically range from white to grey, but those from the Pukaki River site H38/5 are of various colours. Few show any obvious signs of use, though about 50% of the flakes from H38/7 appear to have some use wear. Only one core was found, at H38/5, which has a rough, weathered cortex. Silcrete blades have been found at Killermont No.1 (Fig. 2), and a few fragments of blades were also recorded at Killermont No.2 (Bristow et al. 1990) and site H38/7 on the Ōhau River.

Porcellanite

Only three of the sites contained flakes of porcellanite, in small numbers (Table 1). Those from H38/7 were previously recorded as chert (Trotter 1969), but although quite chert-like in appearance they have a different texture and the colours (predominantly yellow brown, pinkish grey, medium light grey) are typical of porcellanite artefacts from elsewhere (Fig. 3). The porcellanite flakes found at Killermont No.2 were described as being mainly grey and orange in colour (McGovern-Wilson and Bristow 1991).

Chert and Chalcedony

Shepherds Creek is the only site where a significant quantity of chert was found (Table 2). Most of the flakes and pieces (and one core) consist of grey chert, but a few are pale brown and white. The grey chert is typical of material from the Kaikōura area (Moore 2021a). There is also a large core (part cobble) of very weathered, poor quality white chert, which could be from a local source. The assemblage from this site also includes three flakes of chalcedony.

Bristow et al. (1990) recorded a small number of chert flakes at Killermont No.2, and one large flake of a grey to black flint/chert-like material at Avon Burn.

Slate/Argillite

Pieces of slate, or more correctly grey argillite, were recorded at four sites (Table 1). Site H38/7, on the Ōhau River, contained a broken ulu (knife) of dark grey argillite which had been polished on both sides, and possessed a slightly rounded upper edge. It has a minimum length/width of 95 mm, and therefore was probably quite a large object originally.

Five flakes of dark grey argillite with partly polished surfaces were found at site H38/5 and may represent the remains of a slate knife. Another piece of medium to dark grey argillite showing evidence of grinding was



Figure 3. Porcellanite flakes of various colours from the Ōhau River site H38/7. Canterbury Museum 1969.176.12. Photo by the author

also found at Lake Tekapo (I37/8), along with several other pieces with smooth surfaces but no obvious evidence of intentional polishing.

Anderson (2003 fig 12.1) recorded five ulu from the Mackenzie Basin. Two of these appear to correspond to those from the Ōhau River sites, but he also listed two additional items from the Pukaki River. Another was found at or near Grays Hills.

Red argillite has been recorded at four sites. From Boltons Gully H37/1 there is one flake of greyish-red argillite with a smoothed edge and slight polishing on both sides, which may represent a fragment of an ulu. The edge shows longitudinal striations, suggestive of a cutting action. About 40 pieces of red argillite were also found at H38/7, of which two were possibly intentionally polished, although the smooth surfaces could be natural. A single small piece of “ground red slate” was recorded at Killermont No.2, and similar material at Avon Burn (Bristow et al. 1990: 3–4).

Trotter (1969) referred to this material as “red jasper” and noted that it occurred naturally in the river gravels. It is likely to originate from bands of red and green indurated mudstone within the Permian-Triassic greywackes forming the ranges between the head of Lake Pukaki and Lake Tekapo (Cox and Barrell

2007), although there is also a potential source in the Hakataramea valley (Moore 2021b).

Obsidian and Pounamu

Two small obsidian flakes were identified from Shepherds Creek, one of which is olive green in transmitted light and clearly originated from Mayor Island. The other is grey in transmitted light and shows use wear.

One of the two flakes of pounamu (nephrite) recorded from this site had been sawn longitudinally and may be from an adze.

Kokowai

There is one rounded, pebble-sized piece of kokowai from Shepherds Creek, which conceivably could have been used to produce some of the drawings on the shelter wall (see also Trotter 1970b: 449).

Other

Minor use of greywacke was recorded at Lake Tekapo and Shepherds Creek. Two used spalls of greywacke were found at I37/8, Lake Tekapo, one of which is roughly circular and the other more elongate (Fig. 4). There was also a smaller spall of greywacke/quartz which had been provisionally identified as a chisel, though it does not show any obvious sign of use.

At Shepherds Creek there was a broken greywacke



Figure 4. Used greywacke spalls from Lake Tekapo, site I37/8. Canterbury Museum 2008.1075.1. Photo by the author

cobble that had been worked, along with a single flake which may have come from a polished greywacke adze. In addition, the assemblage included a flake of dolerite and piece of basalt, both derived from polished adzes. Thus at least two, and possibly as many as four, different adzes (if the greywacke and pounamu flakes are included) were used at this shelter. Flakes from basalt and greywacke adzes were also observed at Killermont No.2 (Bristow et al. 1990). A broken adze recorded from site H38/5 on the Pukaki River (Trotter 1969) was not among the Canterbury Museum collection.

The only other unusual rock type recorded was a single piece of quartzose fine sandstone, from Lake Tekapo site I37/2, which had been smoothed on one side and along part of an edge. It could have been used in the grinding/polishing or re-sharpening of slate knives. This sandstone might have come from a sliver of Pliocene sediments mapped west of Lake Tekapo (Cox and Barrell 2007), or alternatively from the Hakataramea valley to the east.

Discussion

Although the moa-hunters in the Mackenzie Basin clearly relied on the use of tools made from local stone materials, it is evident they also needed to bring other items (e.g. adzes) with them from elsewhere. This provides us with some indication of the wider connections of these people,

and where they may have travelled from.

It is possible all of the silcrete was procured from the Grays Hills quarry on the eastern side of the basin (Moore et al. 2020), but some could also have been obtained from other sources in the Waitaki valley (e.g. Otekaieke), or even from quarries in Central Otago (Hamel 2001). From the presence of a single core at site H38/5 it could be inferred that suitable flakes were produced on an as-required basis on occasions, although larger silcrete blades were undoubtedly also being carried.

There is no clear indication whether the slate knives or ulu were produced locally or had been brought in as finished tools from elsewhere, though the pieces of grey argillite found at Lake Tekapo (I37/2) and the Pukaki River (H38/5) perhaps suggests there was some attempt to manufacture ulu from local stone, or at least re-sharpen them. In addition to quartzose sandstone, coarse-grained schist would have been quite suitable as a grinding material. According to Anderson (2003: 158), ulu were most likely used for cutting meat and scraping skins.

The presence of red argillite at four sites, including at least two pieces that had been intentionally ground, indicates there was also an attempt to use this local material, possibly for ulu. This is interesting, because the use of red argillite elsewhere in Canterbury seems to have been mainly for non-utilitarian purposes (Moore 2021b). Whether there

was any particular cultural significance (because of the red colour) attached to the use of this material in the Mackenzie Basin requires further research.

Porcellanite was almost certainly obtained from the Bremner quarry site (H40/2) in the upper Manuherikia Valley, about 30 km south of Ōmarama. This is the largest known source of porcellanite in Otago (Hamel 2001, Gillespie 2020). The stone is of variable colour but described as being predominantly light greyish purple (Heritage New Zealand 2018) or pale lavender (Gillespie 2020). There is also some yellow material.

As to where those engaged in hunting moa in the Mackenzie Basin actually came from, one possibility, based on the presence of porcellanite at several sites, is that some travelled from Central Otago, via the Manuherikia Valley and Ōmarama Saddle, which could explain the location of the Killermont sites. It seems more likely, however, that the main route was via the Waitaki valley, given the large number of rock shelters in its upper reaches. Certainly, the Kaikōura chert and obsidian found at Shepherds Creek must have been brought in from the coast, presumably from one or more of the large, semi-permanent settlements in South Canterbury or North Otago, such as Pareora or the Waitaki River mouth.

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