

# ARTEFACT SIZE AND RAW MATERIAL SOURCES IN THE SYDNEY REGION A PRELIMINARY INVESTIGATION

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## ABSTRACT

Ethnographic and archaeological studies indicate raw material availability influenced the types of raw materials used, the extent to which flakes to be used as tools were retouched, and the size of artefacts found on habitation sites. Assemblages at some distance from sources tend to have more intensively retouched artefacts, smaller artefacts and a smaller size range than assemblages found at or close to quarries.

In the Sydney region, silcrete is a common stone used for making flaked tools. Earlier researchers suggested there were few, if any, sources of suitable flakeable stone in coastal Sydney and that silcrete was brought to coastal sites from the Cumberland Plain up to 40 km away. Recent investigations challenge that proposition; several silcrete sources are now known near the Sydney CBD, though the number and extent of known sources on the Cumberland Plain exceeds those known in the coastal zone.

If silcrete sources were less abundant in the coastal zone, or if silcrete was brought into the coastal zone from the Cumberland Plain because of its greater abundance or its greater accessibility there, it might be expected that silcrete artefacts in coastal zone assemblages would be smaller in size, have a smaller size range, and/or that retouched flakes would be more greatly reduced than those in Cumberland Plain sites. This study examines only the size of artefacts.

## AIM

The aim of this project is to investigate whether the size of silcrete artefacts in Sydney region assemblages was influenced by distance to/from silcrete sources.

## THE SITES AND ASSEMBLAGES

Sites were selected to form a broad transect from the coast between Port Jackson and Port Hacking to Richmond on the Hawkesbury/Nepean River – a distance of ~65 km (Figure 1). The sites have been grouped into three geographic zones, east to west: coastal zone (ocean-estuarine), central zone (freshwater-Hawkesbury sandstone) and Cumberland Plain (Wianamatta Group).

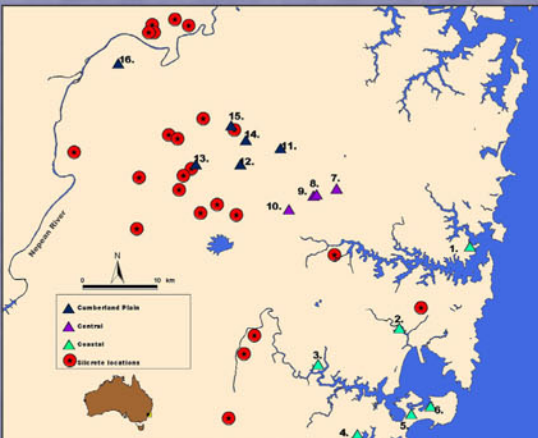


Figure 1: Location of sites and known silcrete sources.

## LIMITATIONS

The results presented are considered preliminary, because of the following limitations on the data used. 'All silcrete artefacts' was chosen as the assemblage component to compare, as few reports provided details about the size of complete flakes. However, to increase our sample, one coastal assemblage includes all artefacts, and one Cumberland Plain assemblage has details for silcrete flakes. Field and analytical methods were not the same for each assemblage. Minimum sieve sizes were usually 2.5–3.0 mm; however, 5 mm sieves were used for part of Mungerie Park and 1.5 mm sieves for part of Rouse Hill RH/SP9 and RH/CC2; the impact of these differences are not known. Measurement methods also differed for Henry Lawson Drive. The age of many assemblages is not known; radiocarbon-dated sites are all less than 5500 years BP, except Darling Mills SF2 where the earliest date was ca 10,000 years BP.

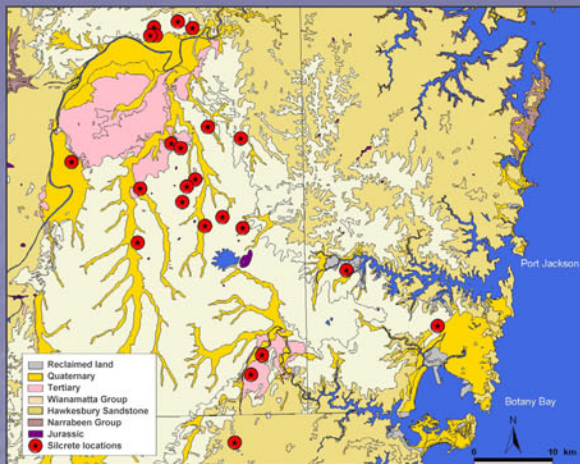


Figure 2: Location of known silcrete sources and geology of study area.

## KNOWN SILCRETE SOURCES

Silcrete is known to occur in several Tertiary and Quaternary formations in the Sydney region (Smith & Clark 1991; Corkill 1999) (Figures 2 and 4). Individual sources are shown on Figures 1 and 2, but the dots on the map represent only a small part of their actual extent. On the Cumberland Plain, recorded sources are on and cluster in a 10 km circle around Plumpton Ridge. Another cluster lies to the north of the Hawkesbury River around Freemans Reach and Wilberforce. Further north sources occur at Maroota and in the south near the Georges River. In the coastal zone, sources have been recorded at Homebush Bay and Newtown, though it is not known if the latter was exposed at ground surface. It seems likely that silcrete was also available from outcrops now built over or covered by more recent sediments, e.g. between Newtown and Botany Bay.

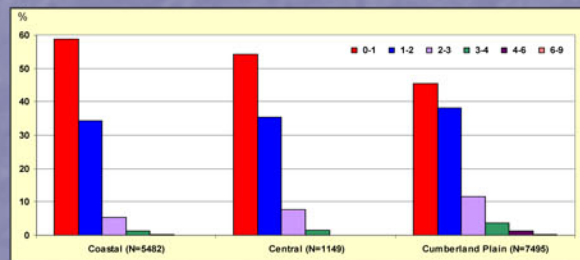


Figure 3: Artefact size categories (cm) grouped by zone (percentage frequencies).

Table 1: Artefact size categories (cm) for sites in each zone. Note: Henry Lawson Drive size categories are: <1 cm<sup>2</sup>, 1-2 cm<sup>2</sup>, 2-3 cm<sup>2</sup>, >3 cm<sup>2</sup>.

Site name	Assemblage component	Assemblage size	Size category (cm)						Reference
			0-1	1-2	2-3	3-4	4-6	6-9	
<b>Coastal (ocean-estuarine)</b>									
1 Balmoral Beach 2, square M5	All silcrete artefacts	1810	81.9	15.5	2.3	0.2	0.1		Attenbrow unpublished data
2 Discovery Point, Tempe	All silcrete artefacts	312	27.9	51.3	15.4	4.5	1.0	Attenbrow unpublished data	
3 Henry Lawson Drive, Paddow	Waste only, all materials	2020	50.0	43.1	5.5	1.4		White and Worsley n.d. [1975]: Table 2	
4 Gympie Bay 1	All silcrete artefacts	658	50.3	40.4	7.3	1.4	0.6	Koening 1998: Table 1-1	
5 Cronulla STP1	All silcrete artefacts	136	41.9	42.6	13.2	1.5	0.7	Dallas et al. 2001	
6 Mac-Madden, Kurnell	All silcrete artefacts	40	17.5	72.5	5.0	5.0		Dallas in prep.	
<b>Central (freshwater-Hawkesbury sandstone)</b>									
7 Devlins Creek, Beecroft	All silcrete artefacts	178	57.9	37.6	3.9	0.6		Haglund 1995: Tables 5-1a and 5-1b	
8 Darling Mills CFS	All silcrete artefacts	302	26.1	52.6	17.0	4.3		Corkill and Edgar 1999: Table 3	
9 Darling Mills SF2: squares 14H-22H	All silcrete artefacts	507	72.2	24.5	3.0	0.2		Attenbrow unpublished data	
10 John Curtin Reserve: squares 12A-12B	All silcrete artefacts	112	60.7	30.4	7.1	1.8		Attenbrow unpublished data	
<b>Cumberland Plain (Wianamatta Group)</b>									
11 Mungerie Park, Kalyville	All silcrete artefacts	4354	42.6	40.3	12.3	3.7	0.2	AMBS 2000-21: Tables 5 and 6	
12 Parklea Leisure Centre open area* test pits	Complete silcrete flakes	690	47.5	36.4	11.7	3.5	0.9	AMBS 2002-24: 39, Table 6	
13 Plumpton Ridge	All silcrete artefacts	456	38.3	37.5	12.7	5.7	3.7	1.1	AMBS in prep.
14 Rouse Hill RH/SP9: all areas combined	All silcrete artefacts	1021	56.7	30.9	7.9	3.5	1.0	1.1	Jo McDonald CHM 1999: 88, Table 28
15 Rouse Hill RH/CC2: test pits	All silcrete artefacts	515	42.3	43.7	10.7	3.1	0.2	Jo McDonald CHM 1999: Table 54	
16 Richmond Market RM1	All silcrete artefacts	459	53.8	29.8	10.9	2.0	3.1	0.4	Jo McDonald CHM 1997: Table 7

## RESULTS

In Byrne's 1980 Western Australian study, the tendency was for the two smaller size categories of silcrete flakes (<2 cm and 2–4 cm) to become proportionally more important over a distance of 27 km from the quarry, while the two larger classes (4–8 cm and >8 cm) became less so.

For the Sydney region, a similar distribution pattern can be seen (Figure 3 and Table 1). In all assemblages in the study, the majority of silcrete artefacts are in the two smaller size categories (0–1 cm and 1–2 cm). For the 2–3 cm and 3–4 cm categories, the proportions within each of the three geographic zones vary. However, in general, the proportions of assemblages in categories 2–3 cm and 3–4 cm are higher (i.e., usually >10% for the 2–3 cm category) on the Cumberland Plain, where known silcrete sources are more numerous and greater in extent, than in the coastal and central zones. Rouse Hill RH/SP9, which has a large knapping floor and backed artefact manufacturing area with a high percentage of 0–1 cm category artefacts (700 of the 1021 artefacts), is an exception.

The Plumpton Ridge assemblage, which is on a silcrete source, has the highest proportion of 3–4 cm artefacts as well as a larger size range than most sites; the proportions in the categories >4cm are higher than in other sites.



Figure 4: Silcrete cobbles and boulders in a railway cutting at the ADI Site near St Marys.

## CONCLUSION

This preliminary study indicates the availability and abundance of silcrete sources influenced the size of silcrete artefacts created in different parts of the Sydney region. In addition, the small number and extent of presently known silcrete sources in the coastal zone compared to the larger number and size of those on the Cumberland Plain and elsewhere in the western Sydney region may reflect a real division in the abundance of silcrete that was available for making flaked tools in different parts of the Sydney region.

More rigorous analyses with consistent data sets from all sites and from a larger number of assemblages in all zones are required to test the size distribution pattern described above. Analysis of the degree of reduction of retouched flakes, including backed artefacts, according to distance from sources is also essential.

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