



# DHARAWAL HATCHETS: PATTERNS OF MOVEMENT IN THE LANDSCAPE OF THE ILLAWARRA REGION OF NSW.

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## Background and Aims

Early European accounts provide an important perspective on movements of Aboriginal people for subsistence and ceremonial purposes. They also indicate that exchange of tools, raw materials and ideas took place in a variety of contexts, including ceremonial occasions. Historical accounts 1821-1904 record movements, gatherings and links between Aboriginal groups and individuals that describe social pathways along which ground-edged hatchets and/or materials for their manufacture may have travelled (Fig. 1).

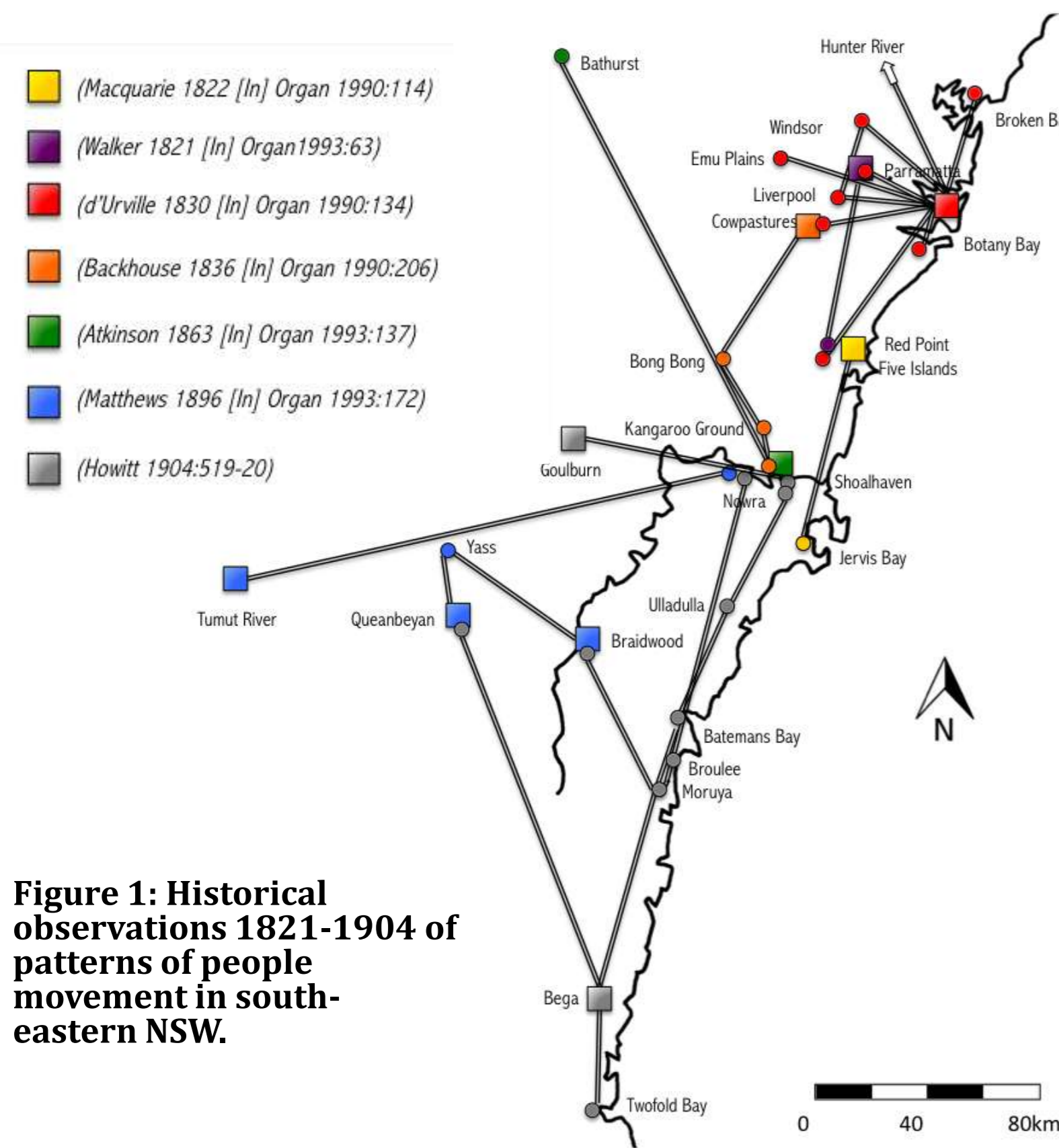


Figure 1: Historical observations 1821-1904 of patterns of people movement in south-eastern NSW.

The degree to which these patterns of movement can be projected back into the pre-colonial past, or describe phenomena influenced by the presence and activities of early colonial settlers, is unclear. We examine this question using archaeological provenancing techniques to characterise pre-colonial patterns of movement of ground-edged hatchets (aka stone axes) from their geological source to find-spot in the NSW Illawarra region.

## Methods

Non-destructive pXRF technology is used to match ground-edged hatchets from the Illawarra region with potential local and non-local rock sources. Elemental compositions of geological and archaeological specimens were identified with a Bruker IV SD pXRF. ASX Artax software deconvoluted spectra and calculated net peak areas. Chemical fingerprinting employed trace elements rubidium, strontium, yttrium, zirconium and niobium (Rb, Sr, Y, Zr, Nb), which are known to differentiate volcanic materials. (See Grave et al 2012 for further details). Rubidium and niobium were key discriminants, with matches to specific geological specimens evaluated using Zr, Rb and Nb (Fig. 2).

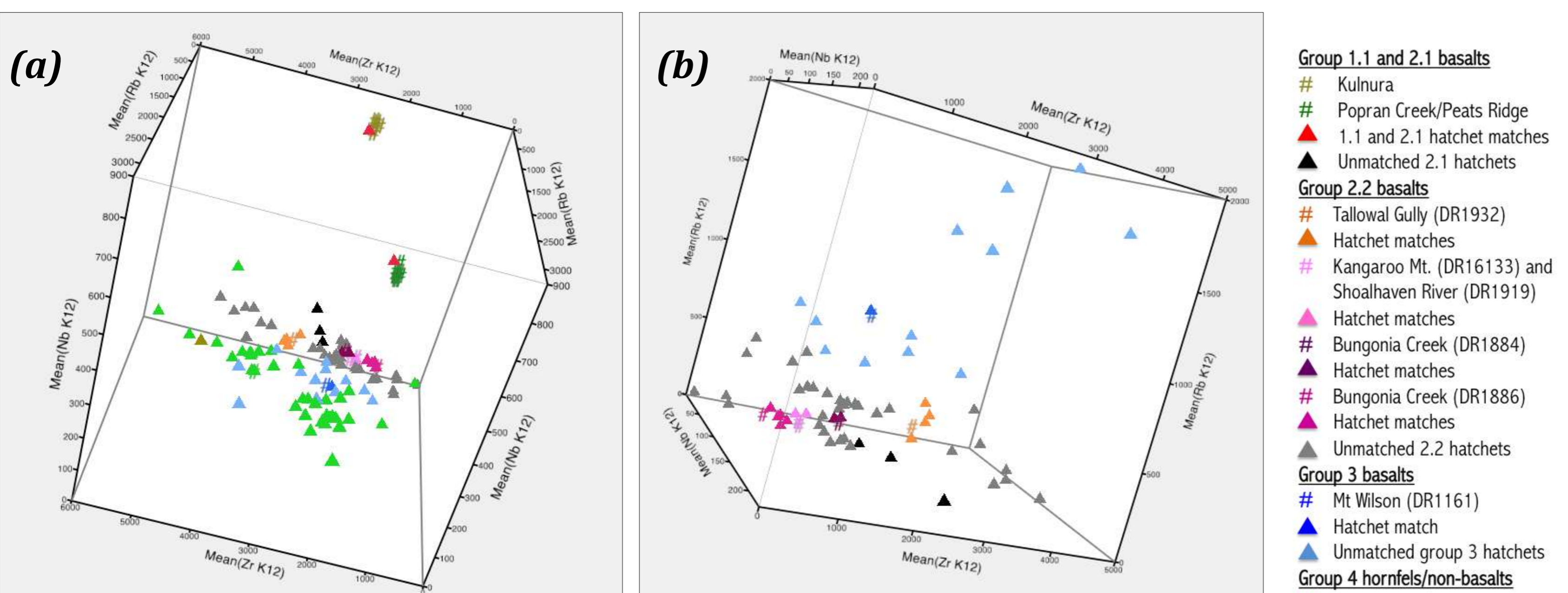


Figure 2: 3D Scatterplots showing Zirconium (Zr), Rubidium (Rb) and Niobium (Nb) for (a) All hatchets and geological source matches and (b) Group 2.2 and Group 3 basalts only. # indicate matched geological sources; indicate hatchets.



Figure 3: Find-spot locations and numbers of ground-edged implements

One hundred ground-edged implements (97 hatchets and three bulga knives) from the Illawarra region and Southern Highlands, held in the Australian Museum Archaeology Collection, are included in this analysis; 65 are from coastal and 35 from hinterland find-spots (Fig. 3). Bellambi (35), Shellharbour (22) and Mittagong (11) provide three areas of focus.

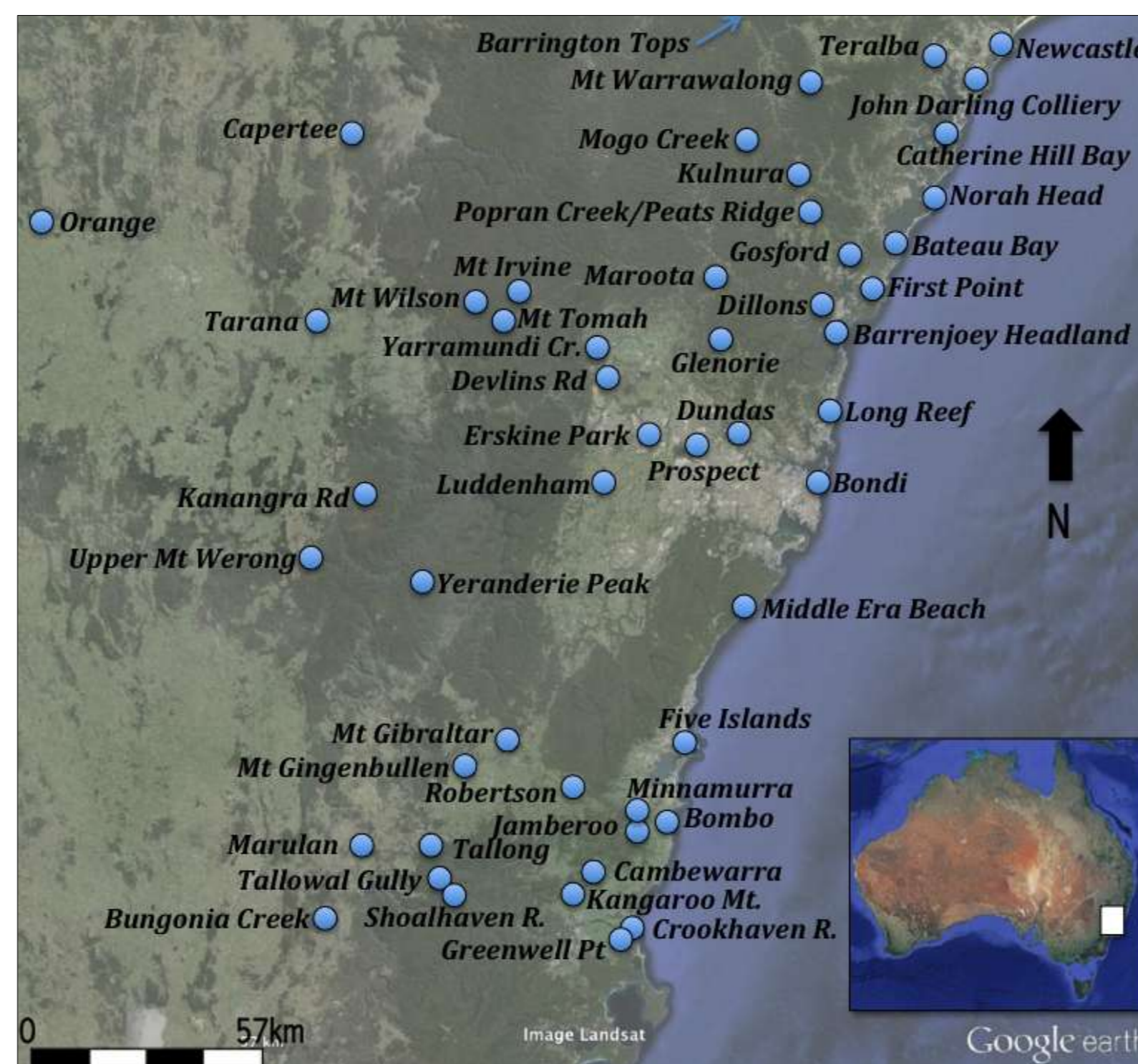


Figure 4: Geological specimen locations

Elemental compositions of the Illawarra hatchets are compared with 168 geological specimens from locations between Barrington Tops in the north, Shoalhaven River in the south and Orange in the west, including 16 potential source locations within the Illawarra region (Fig. 4). Geological specimens from the Australian Museum Geoscience Collection, supplemented with recent fieldwork collection, include basalts, hornfels, dolerites, trachytes, tinguaites, micro-syenites and dacites.

## Results

The pXRF analysis indicates 64% of the hatchets were made from basaltic rocks and 36% from non-basaltic rocks (primarily hornfels) (Fig. 2 and 5). Many were made from cobbles.

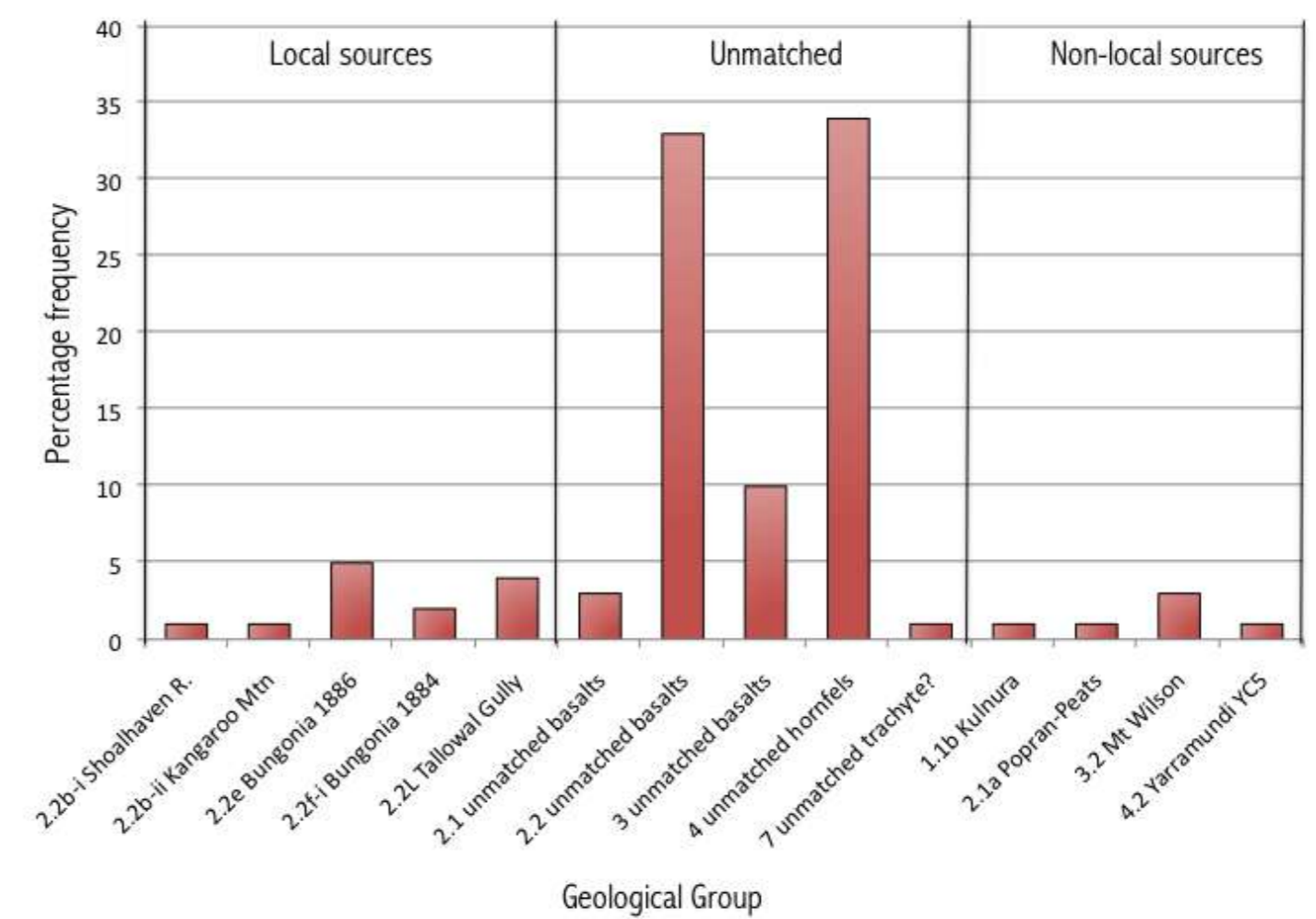


Figure 5: Illawarra Region ground-edged implement matches to geological groups

Thirteen hatchets matched local sources at Shoalhaven River, Kangaroo Mountain, Bungonia and Tallowal Gully (Figs 2, 5 and 6). Four hatchets matched sources outside the Illawarra Region (Fig. 2, 5 and 6). They included two hatchets matched to NSW Central Coast (Mangrove Mountain) basalts, with one matching Peats Ridge-Popran Creek, a commonly used source of basalt for making ground-edged implements in that region (Corkill et al 2012). Two other non-local matches were Yarramundi Crossing (near junction of Grose and Nepean River) in the Sydney region, and Mt Wilson in the Blue Mountains. Other hatchets, which clustered into five groups with between three and six specimens, cannot currently be matched to a source within our geological reference collection.

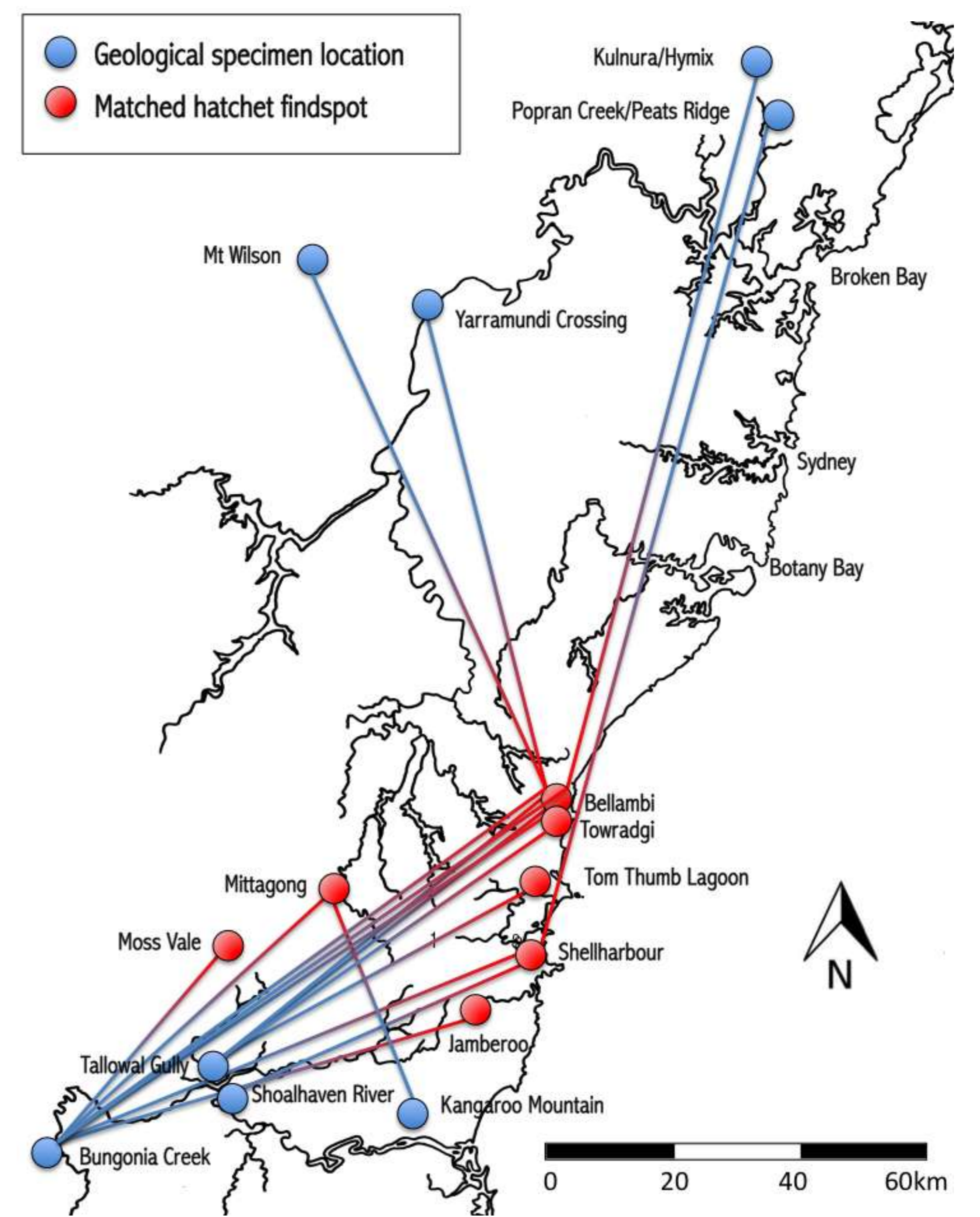


Figure 6: Illawarra Region matches between ground-edged implement find-spot and geological specimen location.

## Conclusions

Matches between hatchets and geological specimens (Fig. 6) identify a strong north-east movement of material from sources along the Shoalhaven River to the coast. and, to a lesser degree, from non-local sources to the north. This suggests a pattern different to the historically recorded movements of Aboriginal people (Fig. 1). Further sampling of potential geological sources is likely to provide a more comprehensive and detailed picture of patterns of movement of hatchets and people in and around the Illawarra region of NSW.

## References

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