





## Parramatta, NSW: a deep time Aboriginal cultural landscape

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*Parramatta, New South Wales, has an extensive Aboriginal archaeological record, retained in a range of aeolian, alluvial and remnant soil landscapes either side of the tidal Parramatta River. Parramatta's archaeological record varies spatially and stratigraphically across the shallow sloping landforms and terraced flats that gradually rise away from the river. This paper applies a chronological categorisation under the framework of the Eastern Regional Sequence to stone artefact assemblages from 26 Aboriginal sites.*

*Some of the chronological and spatial variability observed in the archaeological record can be associated with changing environmental conditions, such as the river becoming a tidal estuary at the Pleistocene/Holocene junction. However, some long-term patterns observed through the archaeological record were not solely driven by environmental change. We have sought to apply social knowledge of local Aboriginal traditions and cultural history to investigate and understand some of the Late Holocene changes.*

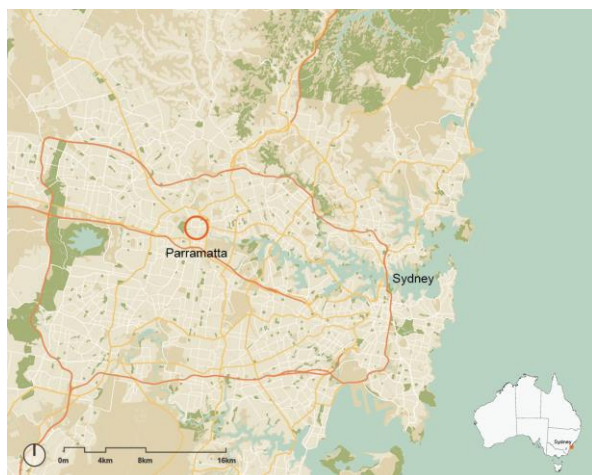
*The local Aboriginal community retains a strong cultural connection with Parramatta, and collation of oral, social and cultural histories provides an overview of these associations. Some of the connections demonstrate principals of social association which could have influenced the pattern of landscape occupation over the last two thousand years. We seek to understand whether the cultural associations resulted in Late Holocene social control in Parramatta, perhaps influencing patterns of landform use, occupation, and consequently deposition of archaeological materials.*

## Introduction

Parramatta is located on Sydney's Cumberland Plain (Figure 1) in New South Wales (NSW); it is Australia's second mainland colonial settlement and Sydney's second city. Parramatta has a grid like pattern of streets, which was laid out soon after the arrival of the British colonists in 1788. By 1804 this pattern was firmly established. The first colonial 'road' (now George Street) connected a wharf constructed near the upper tidal reach of Parramatta River to Old Government House. The centre of the colonial Parramatta settlement was surrounded by allotments, land grants, and agricultural grounds.

However, Parramatta's history did not begin in 1788. It has a long and detailed unwritten record that extends back millions of years (Gale 2021a). Physical archaeological remains demonstrate human connections from the late Pleistocene (GML 2019a; 2022; Player 2019; Williams et al. 2021), principally stone artefacts, transported sandstone, ochre, and pits and hearths for heating and cooking.

Here we juxtapose an examination of changes in lithic assemblages through time with social insights into the Late Holocene structure of Aboriginal connections and land ownership. This demonstrates the enduring influence of First Nations people on modern landscapes.



**Figure 1** The location of Parramatta, in Sydney, NSW.

### First Nations connection with Parramatta

The Traditional Owners of the Parramatta area are identified by local Darug people today, and in early historical accounts at the time of British colonisation, as the Burramattagal or the Boromedegal (Attenbrow 2010a:24; Flynn 1995:7; Kohen 1993:21). The Burramattagal were part of a much broader and larger group commonly referred to as the Darug. Some accounts suggest there were two dialects of Darug: coast and inland (Kohen 1993, 1995), and at the point of invasion (1788) a divide existed between coastal saltwater people and inland freshwater people. Parramatta appears to be at the boundary point for these groups (Karskens 2020:109).

The Burramattagal were one of several clans whose territories abutted the Parramatta River (Attenbrow 2010a; Kohen 1993). In the Late Holocene, these clans may have had shared mythology, ownership, traditions and connection to the Parramatta River (Hoskins 2020). Specific resources and areas with foods, materials (e.g. stone, ochre, certain woods), water and places of tradition, creation and ceremony were owned and controlled by specific people and/or clans. Access to some places and resources was managed through a complex system of social control and trade, and this is reflected through the movement of certain goods and materials, characterised by Middle to Late Holocene patterns in raw stone procurement and use (White 2018:302-311) and

the movement of ground edge axes (Attenbrow et al. 2017).

### Parramatta's palaeoenvironment

Parramatta River is a dominant physiographic feature that flows eastwards into Sydney Harbour (Figure 1) through an incised valley formed by the confluences of Toongabbie, Domain and Darling Mills Creeks. The soil landscapes and ecology of the Parramatta River valley were formed and altered by climatic and hydrological changes through the Late Pleistocene and Holocene.

Throughout the Holocene the river's upper tidal reach has been at Parramatta; the brackish (mixed salt and fresh water) estuary is frequently described as 'the place where the fresh and saltwater meet'. Estuarine circulation pushes the higher density saltwater below the lower density freshwater creating a very productive ecosystem (Geyer 2019). Over the Holocene, Parramatta provided multiple diverse ecological habitats which were significant consistent Aboriginal food and material resources (Cardno 2008).

The tidal river flows through a landscape of terraces, low rises, and gentle slopes. On the south side of the river landforms create a gently undulating plain, around 500m wide (between 4 m to 9 m AHD). South of this plain, a ridgeline (formed by slopes rising from 9 m to 30 m AHD) overlooks Parramatta and provides views into the river valley. The terraces on the southern side of the river comprise mainly a combination of the Parramatta Sand Body (PSB) and a Holocene alluvial soil that is bound by the ridgeline, which creates the watershed catchment for several unnamed creeks, and Clay Cliff Creek (Figure 2; Mitchell 2008).

The PSB forms a sand terrace with an upper surface between 4 m to 9 m AHD on the south side of the river, and 8 m to over 14 m AHD on the northern side. The PSB is entrenched by silt-filled channels and swamps. The formation period of the PSB varies from the Late Holocene to no earlier than 58–50 ka (GML 2019a, 2022; Mitchell 2010a; Player 2019; Williams et al. 2021). The



different formation dates for different expressions of the PSB can be attributed to the varied formation processes of the sediment body and/or proximity to the Parramatta River. Particle Size Analysis may be used to identify the mechanism of deposition of a deposit; PSB associated with flood zones can be strongly indicative of a fluvial origin (e.g. Williams et al. 2021), whereas the elevated PSB terraces have often been reworked and winnowed by aeolian processes (e.g. Gale 2021b; GML 2019b, 2021, 2022; Player 2019).

The second soil landscape associated with Parramatta is alluvial (Mitchell 2008; Gale 2021b). Alluvial soils formed waterlogged wetlands, with deep gullies, channels, ponds and marshes (Tench 1793:211). These wetland areas would have supported rich and varied ecosystems which differed from those on the adjacent PSB. The general understanding is that these predominantly date to the Holocene.

The tidal regimes dictated the early pattern of colonial expansion, for instance the first government wharf at Parramatta was constructed at the low tide point. Overbank flooding remains an issue to this day, and extensive attempts have been made to control the river's waters. For the colonial British, Parramatta became an important centre for government, however, there are no historical records that record or identify the importance of Parramatta to the Burramattagal. To address the Deep Time Aboriginal connections we can examine both the archaeological and cultural records.

## Archaeological Background

### The Eastern Regional Sequence

The stone materials used by Sydney's Aboriginal people, the methods they used to make stone artefacts, and the types of stone artefacts made changed considerably over the last 10,000 years. These changes were first described by McCarthy (1976) as the Eastern Regional Sequence (ERS). The technical basis of the ERS has been refined by Hiscock and Attenbrow (2005), while White has

rigorously applied the model through her PhD and publications (White 2017, 2018, 2021).

On the Cumberland Plain the majority of Aboriginal worked stone is represented by three locally derived materials: Indurated Mudstone/Silicified Tuff (IMST), commonly referred to as mudstone; silcrete; and quartz. A number of other non-local stone types are recovered in low concentrations (e.g. Barry et al. 2021). The ERS describes distinct phases for the Aboriginal occupation of Sydney and provides a chronological framework for interpreting Holocene sites. These phases are reflected in the archaeological deposits recovered from Aboriginal sites in Parramatta. The four ERS phases are:

- Phase 1—Pre-Bondaian (or Capertian phase), prior to 7,000 BP (Before Present). Aboriginal people predominantly used IMST, with limited amounts of silcrete and quartz. IMST is thought to come from the Hawkesbury-Nepean River gravels and Rickabys Creek Formation on the northern Cumberland Plain (Doelman et al. 2015). Unifacial flaking of cores was the predominant reduction technique. There is no evidence of conservation of raw materials implying there was no shortage. Ground stone is absent (McDonald 2008:39) and backed artefacts rare (Hiscock and Attenbrow 2005) or absent before c12,000 years ago (Williams et al. 2014). Aboriginal people used manuports of ferruginous shale and sandstone, obtained locally from the Parramatta River or adjacent hillslopes.
- Phase 2—Bondaian, after 7,000 BP to 1,500 BP. The use of IMST decreased and silcrete became the predominant material. The use of silcrete often involved heating the raw material to improve its flaking qualities. Cores and tools became smaller, and backed artefacts were made. People started rationing the material they used to make stone tools (Hiscock 1986; Kohen et al. 1984). The increased use of silcrete suggests that people

began relying on local resources, and no longer travelled across the Cumberland Plain to the Nepean River or the Rickabys Creek Gravels as frequently as during Phase 1. This could be linked to decreased mobility and increased territoriality, with people living in smaller groups in well-defined areas or territories. The use of silcrete to produce more specialised tools (e.g. backed artefacts) suggests increased sophistication and specialisation within the tool kit.

- Phase 2B—Late Bondaian, after 1,500 BP to 1788 BP. The use of quartz increased, and ground-edged implements became more prominent (Attenbrow. 2006; Corkill 1999:132-134; McDonald 2008:35–41, 349–350). Flaking frequently involved the use of the bipolar technique on quartz, with some evidence also appearing on silcrete, IMST and other raw material types (Kohen et al. 1984:49; Hiscock 2003; Miller 1983). Bipolar flaking enabled people to produce flakes from very small cores, which meant that they did not have to carry or move stone supplies.
- Phase 3—the Contact Phase, following European invasion in 1788. The arrival of the British brought new materials into the region they called Sydney, from sources external to Australia, including glass, metal, ceramic and flint (Owen et al. 2019).

### Archaeological excavations in Parramatta

The importance of both the PSB and alluvial soils is their ability to yield archaeologically stratified sequences. Understanding these stratigraphic sequences for each Aboriginal site can require multiple avenues of investigation, commencing with high resolution archaeological excavation, coupled with sedimentary analysis, OSL and carbon dating, lithics analysis sufficient to classify assemblages (through material classification, cortex analysis, typology of artefacts, methods of manufacture and maintenance, flake size and shape), and conjoin analysis to investigate movement through sediments.

The PSB and surrounding soil landforms have been subject to detailed archaeological excavation since 2003. Since then, more than 50 compliance-based investigations have occurred within Parramatta; some covering long linear corridors, such as the Parramatta Light Rail (GML 2019a). As part of her PhD, White (2018) undertook detailed analysis of lithics sites across Sydney, including Parramatta, to understand stone material use through time. The analysis identified patterning that allowed discrimination of ERS assemblages. Through the Arthur Phillip High School (APHS) investigations this assessment was expanded to include 26 Parramatta sites (GML 2021:285-299).

There is some clustering or patterning within each ERS phase. Most Phase 1 (before 7,000 BP) sites (10 of 14) are situated at the eastern end of Parramatta, in a cluster with a diameter around 300m. The cluster extends away from the river (Figure 4: locations 17, 18, 19, 23 and 25), up the slopes of ‘Macquarie Street’ (13, 14 and 15), and onto the alluvial soils of Clay Cliff Creek (24). Phase 2 evidence is also present at most of the Phase 1 locations; further Phase 2 sites are present, covering additional landforms. Phase 2 sites are generally situated parallel to the river, many on the elevated landforms associated with the wetland alluvial landscape at the centre of Parramatta (Figure 5: locations 8, 9, 10, 11 and 16). The main concentration of Phase 2 sites covers an area 1km in length.

There are fewer Phase 2B sites than Phase 1/2, and these are concentrated into four general locations, three of the locations are on higher ground (AHD all above 9m), only locations 21/22 are positioned near the river on lower lying landforms (Figure 6, Table 1). There appears to be a ‘withdrawal’ from Phase 2 locations. Phase 3 locations are very similar to those in Phase 2B, which either demonstrates a continuity in use of each place or some other cultural connection, such as occupation at the margins of the British settlement (Figure 7).

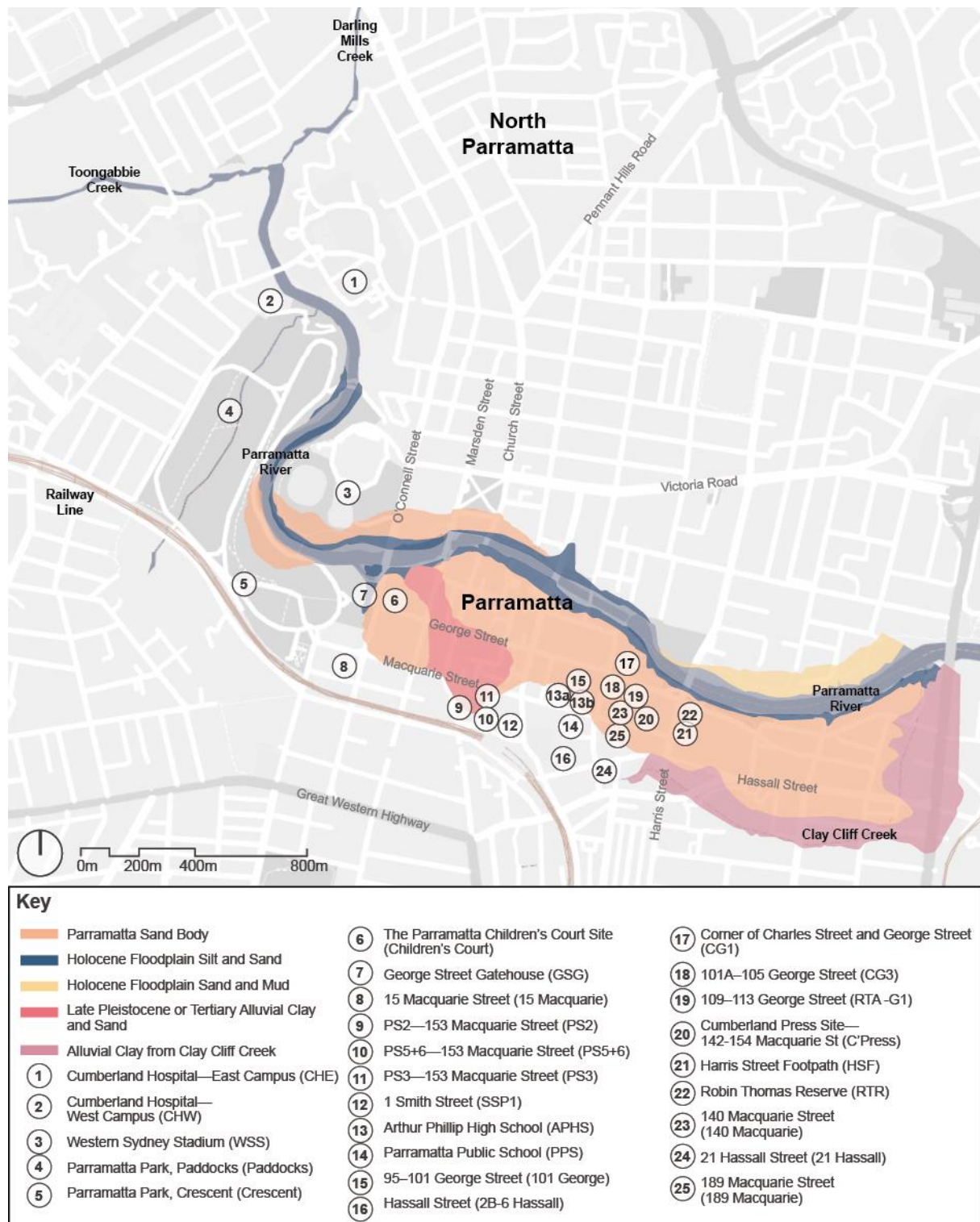


Figure 2 The location of Aboriginal sites across Parramatta, as described in Tables 1 and 2, including mapped expression of the soil landscapes by Mitchell 2008.

Aboriginal Site	AHD (m)	Distance from Parramatta River	Extent of Excavation (m <sup>2</sup> )	Total Artefacts	Mean Density Artefacts /m <sup>2</sup>	Max. Density /m <sup>2</sup>	Report Reference
CHE (PNGC) <150m	11.84	<150 m	90	1,358	15.1	83	CC 2018a, GML 2019a, GML 2022
CHE (PNGC) >150m	~14	c. 150–500 m	63	144	2.3	7	
CHW	~13	c. 100 m	40	255	6.4	36	CC 2019a
WSS	~10	c. 120–240 m	91	513	5.6	30	CC 2019b
Paddocks in Parramatta Park	~12	c. 250–270 m	97	447	4.0	74	CC 2016
The Crescent in Parramatta Park	~9	c. 100–130 m	63	15	0.2	3	CC 2016
Children's Court	~9.3	c. 250 m	59.75	870 or 875	14.6	n/a	Haglund 2005, 2007
George Gatehouse Street in Parramatta Park	9.65	c. 80 m	5	8	4	4	GML 2019b
15 Macquarie Street	~9.5	c. 340 m	86	197	2.3	13	CC 2007
Parramatta Square 2	9.42	c. 530 m	85	261	3.1	83	CC 2019c
Parramatta Square 5+6	~11.5	c. 510 m	90	126	1.4	10	CC 2019d
Parramatta Square 3	~11	c. 470 m	122.3	325	2.7	35	CC 2018b
Smith Street	~11.5	c. 500 m	78	164	2.1	26	JMcD CHM 2004.
APHS—PSB	~7.5	c. 250–305 m	22	65	3.0	18	GML 2021a
APHS—Alluvium	~9.5	c. 370–390 m	23.5	311	13.2	40	
PPS—Blacktown	~10	c. 370–390 m	75.75	1,124	14.8	101	
APHS & PPS Total	—	c. 250–390 m	117.25	1,488	12.7	101	
101 George Street	~7	160–215 m	70	601	8.6	59	Austral 2005
2B-6 Hassall Street	~11	c. 520 m	170	411	2.4	25	CC 2019e
CG1/Areas A–D	~6.9	75–130 m	112.5	2,613	23.2	136	JMcD CHM 2005a
CG3	~6.5	c. 250 m	123.5	502	4.0	47	JMcD CHM 2006.
RTA-G1	6.60	100–140 m	132	4,204	31.8	161	JMcD CHM 2005b
Cumberland Press	~6	c. 110 m	22.5	95	4.2	37	Haglund 2008.
Harris Street Footpath	~6.5	c. 50–200 m	9	59	6.5	29	CC 2015, GML 2019a.
RTR	~6.5	c. 50–200 m	~25	~55	—	—	GML 2022, Extent 2019.
140 Macquarie Street	~5.45	c. 250–305 m	34	67	3.5	15	CC 2010
21 Hassall Street	8.60	c. 380 m	33	<1,384	<42	n/a	AHMS 2016
189 Macquarie Street	6.66	c. 320 m	10	25	2.5	21	AHMS 2013

**Table 1** Details on Aboriginal sites included in this research. AHD (m) is the approximate height of the upper layer with Aboriginal cultural deposits. Most site records present several AHD (or an approximation of AHD). In these instances, the greatest height is presented. Some locations retained a historical topsoil which mixed the top of PSB/alluvium with historical surfaces, or exhibited historical features; such layers are excluded from the calculation. Distance from the river is the closest point with cultural material to the Parramatta River. Artefacts only refers to cultural lithics with evidence of Aboriginal manufacture/use; this excludes manuported sandstone and items such as ochre (some sites had large quantities of such materials). The disparity between mean and maximum density demonstrates the variability that can occur intra site, noting that mean densities calculation includes test pits without cultural material.

Aboriginal Site	Key #	Soil Landscape	Phase 1	Phase 2	Phase 2B	Phase 3
CHE	1	PSB				
GSG	7	PSB				
APHS Quadrant 3+4	14	Blacktown				
Children's Court	6	PSB				
APHS Quadrant 1	13A	Alluvium				
CG1	17	PSB				
CG3	18	PSB				
RTA-G1	19	PSB				
140 Macquarie Street	23	PSB				
95–101 George Street	15	PSB				
189 Macquarie Street	25	PSB				
21 Hassall Street	24	Sand dune (alluvial)				
WSS	3	Alluvium & PSB				
APHS Quadrant 2	13B	PSB				
Cumberland Press	20	PSB				
Paddocks	4	Blacktown				
Crescent	5	Blacktown				
15 Macquarie Street	8	Alluvium				
PS5 & 6	10	Alluvium				
RTR	22	PSB				
2B-6 Hassall Street	16	Blacktown				
HSF	21	PSB				
PS2	9	Alluvium				
PS3	11	Alluvium				
1 Smith Street	12	Blacktown				
CHW	2	Blacktown				

**Table 2 Summary of Parramatta's Aboriginal sites under the ERS. The sites have been ordered by chronological phase, and denote the associated soil landscapes. Site key references for figures are provided.**



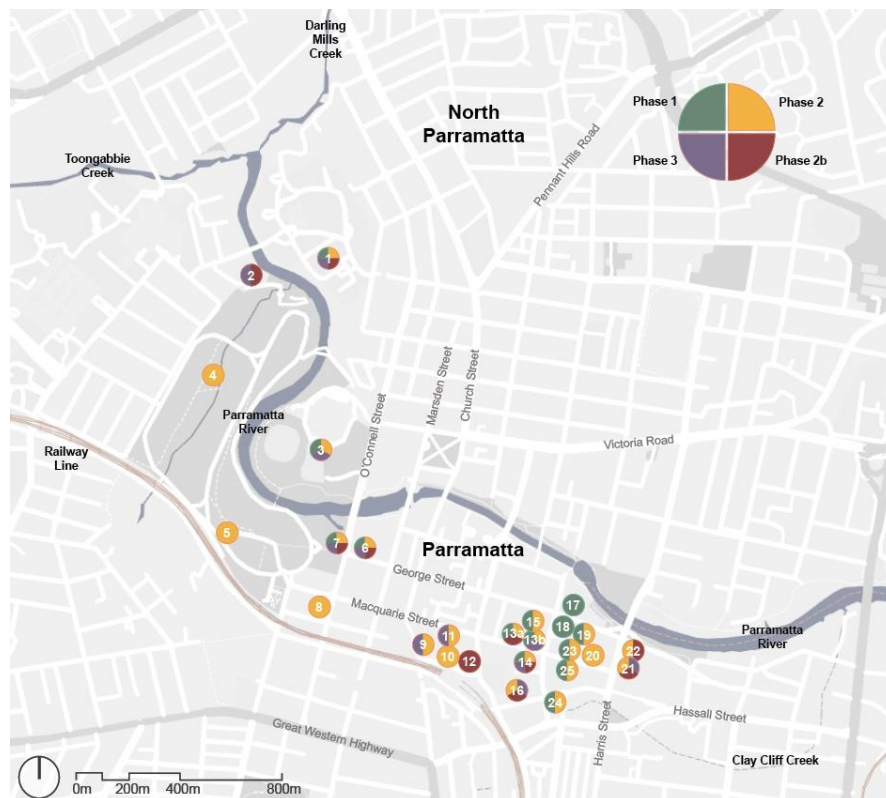


Figure 3 Aboriginal archaeological sites considered through this analysis and their assessed ERS phases of use



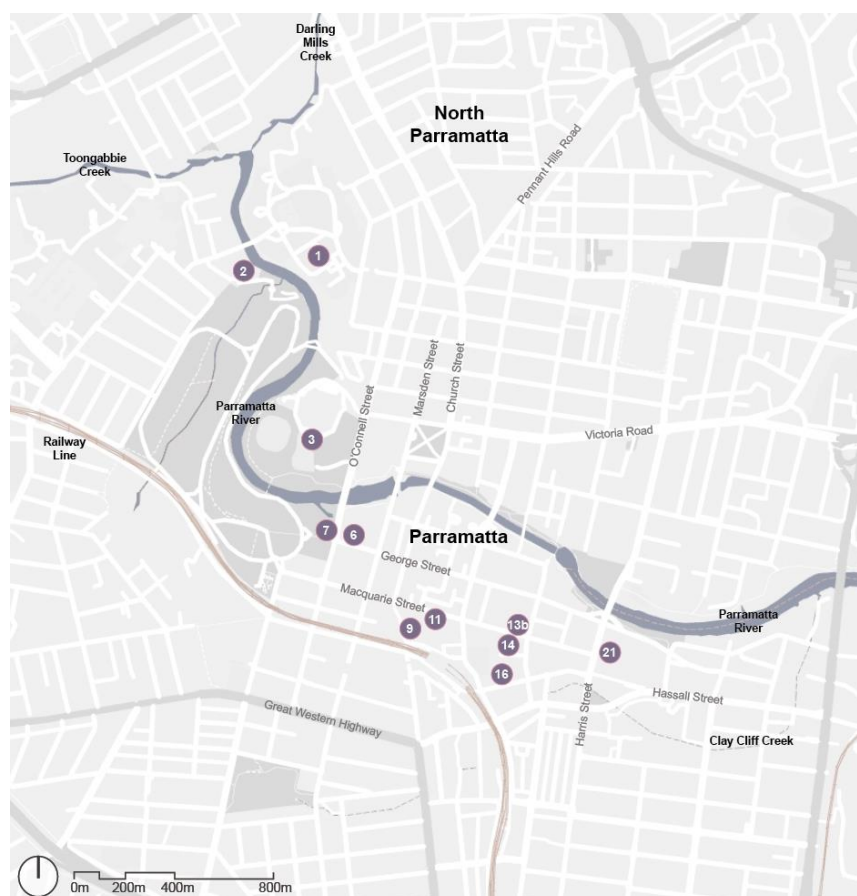
Figure 4 Phase 1 Aboriginal archaeological sites.



Figure 5 Phase 2 Aboriginal archaeological sites



Figure 6 Phase 2B Aboriginal archaeological sites



**Figure 7 Phase 3 Aboriginal archaeological sites**

The archaeological patterning suggests a change in land use between ERS Phases 2 and 2B, and it requires explanation. At this time, social complexity increased, population numbers and density expanded, existing technology was adapted and new technology was invented and adopted, and methods of trade and raw resource procurement became restricted. Together all of these changes can be referred to as a period of ‘intensification’ (Morgan 2015). Late Holocene subsistence risk minimisation strategies (Attenbrow 2006:236) aimed to secure food sources connected with the rich estuary, key ecological zones and wetlands on the alluvial landscapes. This strategy required increased numbers of expeditions from ‘base camps’ into a multitude of activity areas. It could therefore be expected that the distribution of Phase 2B archaeological evidence would be found across a wider area. However, in Parramatta the shift between ERS Phase 2 and 2b (Figures 5 and 6)

appears to suggest the opposite—the distribution of archaeological evidence contracts

## Discussion

Phase 2B Aboriginal occupation indicates some ‘absence’ of archaeological deposit. A similar pattern has been previously identified elsewhere in NSW (Attenbrow 2006), where the archaeological record appears to demonstrate a ‘withdrawal’, closure, and/or general reduction in occupational evidence. The Burramattagal could have implemented risk reduction strategies, limiting access to land and resources through territoriality, and an increase in rituals. These may be connected with traditions associated with the river and its tidal forces. Understanding and reconnecting with Parramatta’s local traditions is an ongoing process (e.g. Nunn and Reid 2016). A compilation of Parramatta’s cultural history, with inclusion of oral records held by Darug people today, can provide further understanding and interpretation of the archaeological record.

## Parramatta as a strategic location

During the ‘intensification period of the late Holocene’ ... ‘the coastal and inland peoples of the Sydney region became separated and isolated from one another’ (Karskens 2020:109). On arrival the British immediately made a strategic location, the place from which all expeditions inland commenced. For the local Aboriginal population, the junction of fresh and salt water was possibly both a strategic location and an inland ‘boundary’. First Nations knowledge of Parramatta was recorded through the early historical records of the British. In April 1791 Aboriginal men Coleby and Ballooderry (of the coastal Gadigal, of Sydney Harbour) accompanied the British as guides and intermediaries on an expedition to trace the course of the Hawkesbury River. On leaving Parramatta (Rose Hill) it was anticipated that Coleby and Ballooderry would be familiar with Aboriginal people in the woods Country:

We expected to have derived from them much information relating to the country, as no one doubted that they were acquainted with every part of it between the sea coast and the river Hawkesbury... At a very short distance from Rose Hill, we found that they were in country unknown to them, so that the farther they went the more dependent on us they became, being absolute strangers inland. (Tench 1793:187-188)

Coleby and Ballooderry were unhappy and restless through their journey inland:

We observed that they were thoroughly sick of the journey, and wished heartily for its conclusion: the exclamation of ‘Where’s Rose Hill, where?’ was incessantly repeated, with many inquiries about when we should return to it. (Tench 1793:198)

When the party eventually returned to Rose Hill (after five days away) Coleby and Ballooderry had ‘great joy’, but sought an immediate return to Sydney Harbour. Parramatta or Rose Hill represented the furthest inland location these two Aboriginal men knew and trusted; beyond this locality they became distressed, probably understanding they were trespassing.

## Fresh, salt and brackish waters

Aboriginal groups across Australia make a significant cultural distinction between saltwater, freshwater and the brackish water (Sharp 2002). These distinctions are also true in Sydney (Foley and Read 2020:37-38); and archaeologically identified through the *Port Jackson Project* with distinct signatures between coastal/estuarine environments and the hinterland/freshwater environments (Attenbrow 2010a:51, Figure 12).

Parramatta’s point of salt and fresh water intersection created an ecotone associated with eel migration and breeding, which is connected with the traditional name—Burramatta or ‘the place where eels lie down’ (Flynn 1995:7). The eel was a significant local food source, and today cultural connections between the Burramattagal people and the eels are celebrated with the annual Eel Festival (NITV 2016; Sydney Living Museum 2020). Eels are seasonally available, providing a significant food resource in autumn:

They [the Burramattagal] resort at a certain season of the year (the month of April) to the lagoons, where they subsist on eels which they procure by laying hollow pieces of timber into the water, into which the eels creep, and are easily taken. (Collins 1804:462)

The eel is also a significant Dreamtime ancestral being. The Darug hold beliefs about the connection between spirits and small animals with special powers (Kohen and Lampert 1987:364), which remain within oral tradition today. The relationship between animals and humans underpinned the symbolism of totems, and formed a central tenet of the Dreaming or creation (Attenbrow 2010a:129; Berndt 1974). The eel is part of the system of creation and Dreaming, with Darug, Dharawal and Gandangara people all holding different accounts and connections with eels.

Sydney Harbour and Parramatta River are associated with Parra Doowee, the eel Dreaming spirit (Brett 2020), and the warm and wet season, from November to December, when the summer heat starts:



This season begins with the Great Eel Spirit calling his children to him, and the eels which are ready to mate make their way down the rivers and creeks to the ocean (Bureau of Meteorology 2021).

One Creation or Dreamtime 'hero' is Gurangatch (also Gu-rang'-atch, Gu-rung-adge, Gurangadge, or Garangatch), a giant eel or part eel, part reptile (Matthews 1908; Russell 1914:22-23; Smith and Bliss 2018; Williams 1988). Gurangatch's presence in waterholes is associated with a powerful being in the water, and a reason that access to the 'dangerous' water was restricted (Russell 1914). This restriction is applied to Parramatta by Darug people today.

Eels are a common motif in Sydney's engraved and pigmented rock art (Attenbrow 2010a:146-148, 150, 184-185), associated with rock art phases 2 and 3 (4,000 to 1,600; and 1,600 to 1788) (Dibden 2011:156, 227-228). In southern Sydney, studies of rock art motifs have identified a significant geographical difference in the orientation of eel images—south of the Georges River, pigmented images of eels face downwards; north of the Georges River, eel images point upwards (Attenbrow 2010a:150), suggesting that the Georges River forms a 'cultural boundary'. Darug people identify a similar boundary at Parramatta. The eel is linked to the daily movements of the tidal waters and a supernatural being who inhabits the fast-moving currents. The cultural restrictions on entering the waters can be seen to have two objectives: to reinforce local traditions associated with a supernatural being; and to preventing drowning consequent of being towed by the strong undercurrents at the tidal point on the river.

### **The moon, tides and ceremony**

Darug cultural knowledge identifies five different types of tide on the Parramatta River (king, high, low, ebbing and neap tides) and a connection with five different moons (full, waning, quarter, crescent and old). Understanding the relation between tide height and moon phases is common within coastal Aboriginal groups (Clarke

2009:50). Under east coast Aboriginal tradition, the moon is a significant and powerful male being (Norris and Hamacher 2011:100): 'Several Dreamings associate Baiame [the primary southeastern Australia ancestral being (Attenbrow 2010a:128)] with boomerangs and crescent Moons' (Leaman and Hamacher 2019:231).

The moon is frequently depicted in Sydney's engraved and painted rock art. The crescent shapes represented in petroglyphs are thought to represent the moon during a lunar eclipse, and reflect Aboriginal people's considerable astronomical understanding of celestial movement and events (Norris and Hamacher 2011:100-101). Clarke states, 'in general, the Moon and Sun Ancestors are of primary importance due to their influence over the night and day skies, respectively. Often the Moon was male and subordinate to the Sun...' (Clarke 2009:44)

The moon is connected with the measurement of time (Clarke 2009:50), and linked to ceremonies that fit the seasonal and lunar cycles (Morphy 1999:265). Along the eastern coast of Australia, the moon held significance and was part of regional marriage and descent rules (Smyth 1879, cited in Clarke 2009:44). Ceremony required certain conditions, times of year, a connection with the moon, and adequate food resources to nourish participants (Clarke 2009:50).

Traditional associations between the lunar cycle, ceremony and tribal gatherings at Parramatta were still recognised in 1826, long past invasion (The Australian 1826:3). At Parramatta, the Darug associated the type of tide, with the phase of the moon, linking the water system, eels (both as a food and creation ancestors), to the moon and the creator Baiame.

### **Floods and thunderstorms**

The alluvial soils in the centre of Parramatta were connected with a Holocene wetland area (Tench 1793:211), which to date has yielded little archaeological evidence (Figure 8). This area held many ponds and channels and was regularly inundated. The pattern of rapid overbank flooding,

through the Holocene, appears to have been understood by Aboriginal people. The cluster of Aboriginal sites on the eastern side of Parramatta is located adjacent to the margin of one lower lying flood area—perhaps attesting to Aboriginal knowledge of the dangers of rising flood waters, and ability to avoid the primary risk zones.

Rapid overbank flooding occurs (even today) when a supercell thunderstorm deluges water into the upstream Parramatta River catchment. Combined with a high tide, flash flooding can occur within nine minutes of such a rain event (SMH 2020). Darug tradition identifies that thunder and lightning are associated with Baiame and his son, Daramulun. Lightning has been described as the creator Baiame, and the path of the lightning shows the route that Baiame walked through Country.

In Sydney, thunderstorms most often occur between October and March, particularly in the afternoon and evening in summer (Potts et al. 2000:3308). These summer storms develop over the Blue Mountains, inland from the coast, and move east from the mountains over the coastal plain, out to the ocean (Potts et al. 2000:3318). This lightning ‘pathway’ is also the creation pathway described by Darug people, and leads from the inland Cumberland Plain to the coast.

The sound of thunder is associated with Daramulun. Daramulun is very significant in the Burbung ceremony where boys are ‘made’ into men (Leaman and Hamacher 2019:227; Matthews 1896). It was said that Daramulun had a loud voice which was often revered and replicated by Aboriginal people using bull roarers.

A long time ago there was a gigantic and powerful being, something between a blackfellow and a spirit, called Dhuramoolan [Daramulun], who was one of Baimai’s [Baiame’s] people. His voice was awe-inspiring and resembled the rumbling of distant thunder (Matthews 1896:297).

At Parramatta, flash flooding is described under local lore and tradition as an association between the powerful river waters, local Dreamings and ancestral/creation beings Baiame and Daramulun, thunder and lightning, and governance of tides by the moon.

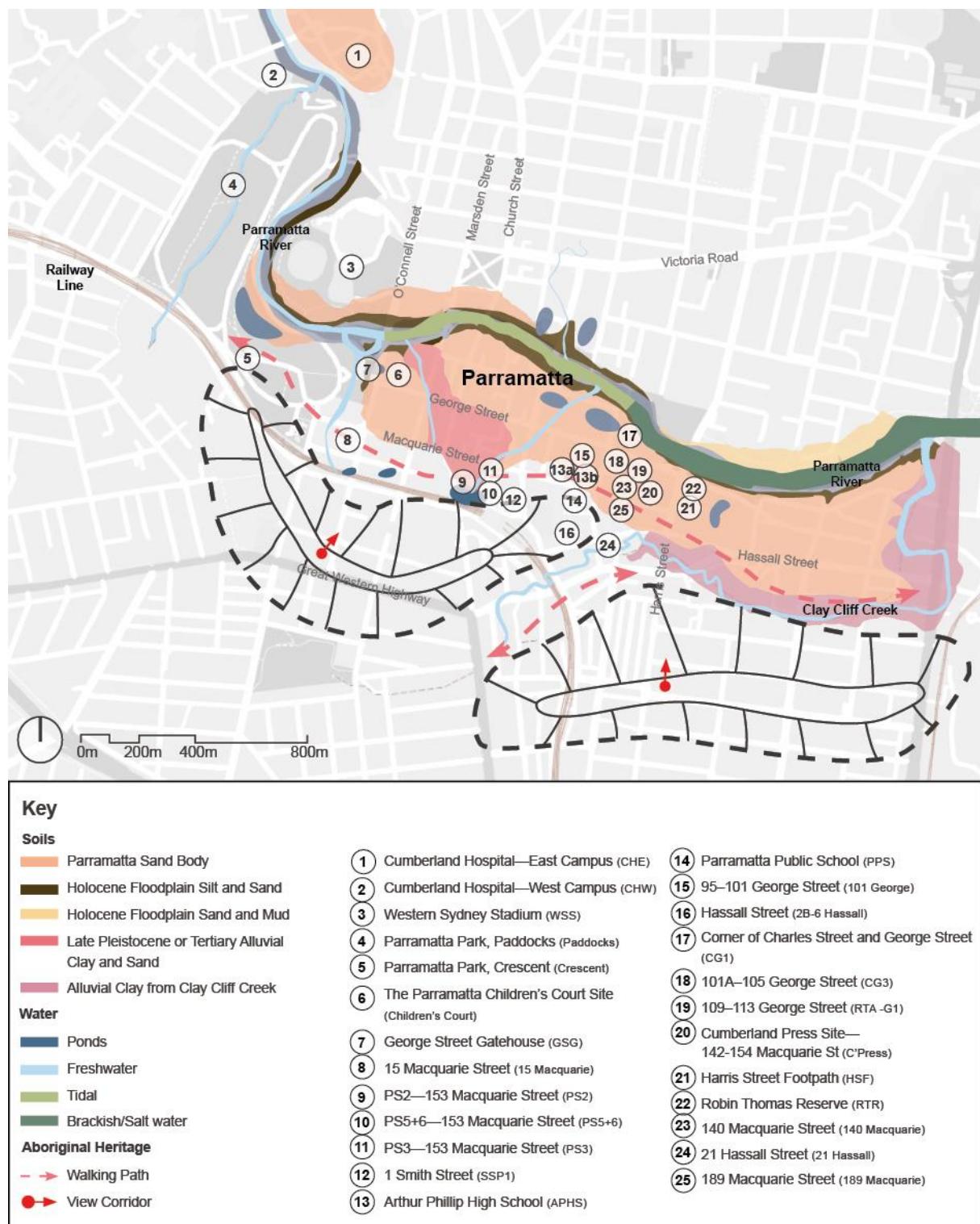
### After 1788

Following colonisation, the Burramattagal attempted to continue use across their traditional lands, which is evident archaeologically through the presence of glass, ceramic and flint objects (Figure 7). Two British accounts recorded the Burramattagal anger at being displaced:

...the natives [sic] were very angry at so many of our people being sent to Rose-Hill. Certain it is that wherever our colonists fix themselves, the natives are obliged to leave that part of the country (Hunter 1793:312).

...they were inhabitants of Rose Hill, and expressed great dissatisfaction at the number of white men who had settled in their former territories. In consequence of which declaration, the detachment at that post was reinforced on the following day (Tench 1793:181).

. The length of the Burramattagal’s continued presence post invasion was short. In 1801 Governor King proclaimed that Aboriginal people around Parramatta were to be driven away from the settlement by gunfire (King 1801:362). In 1804 government decree allowed Aboriginal people to ‘re-enter’ Parramatta; it is uncertain how and whether the Burramattagal returned. A ‘payback’ ceremony (1804) attests to certain traditional activities occurring (Flynn 1995:34), but the later blanket returns do not identify Burramattagal people. Some have hypothesised that many Burramattagal died during the 1789 smallpox epidemic and the Aboriginal-colonial conflicts that occurred in the Parramatta area between 1791 and 1802, or Burramattagal people may have joined surrounding Aboriginal clans at Prospect and Kissing Point (Flynn 1995:14, 40).



**Figure 8** Places, features and interpretation of the Holocene Aboriginal cultural landscape prior to colonisation. Source: Owen, White, Dharug Custodial Knowledge Holders, drawing on interpretation of archaeological records, historical maps, traditional knowledge and geophysical data.

Few records associate Aboriginal people with Parramatta until the start of Macquarie's annual feasts in 1814. This could be partly associated with the social restrictions which had applied to Parramatta under the control of the Burramattagal.

Following 26 years of occupation Aboriginal people started to return. Their return would have been to a place significantly modified since their occupation in 1787. Whilst their cultural landscape may have remained fundamentally readable, and

the power and effects of the river were still known, it is possible that the passage of time had altered First Nations connections and knowledge of specific places

## Conclusions

Across wider Sydney Phase 2B 'intensification' culminated in:

- Higher population densities than Phase 2 (Williams et al. 2015a, 2015b);
- Increase in the number of 'activity locations' with use of additional marginal landform locations inside the Phase 2 territories (Attenbrow 2006:231);
- Restricted residential mobility and social closure (Lourandos 1997:240-241, 243) associated with more fixed and defined clan and tribal boundaries (White 2018:299);
- More complex systems for food procurement (Attenbrow 2006:231), including shifts towards domiculture and longer-term food security;
- No new diversity occurred within the stone tool kit, but the raw stone resources, methods of stone procurement and working changed (Hiscock and Attenbrow 2005). Artefact accumulation rates on sites decreased (Attenbrow 2006:234). Materials other than stone started to be used for common tasks e.g. an increased use of wood (Attenbrow 2006:240), and shell (Attenbrow 2010b).
- Higher levels of competition between individuals and intergroup complexities marked by extensive moiety systems (Foley and Read 2020; Matthews 1897) which underpinned trade, marriage and ceremonial behaviours (Matthews 1898:68), possibly leading to privileged control over key resources which transferred intergenerationally (Bird and O'Connell 2006:168).

ERS Phase 2B (Late Holocene) changes were driven by changes in demography, increasing population densities, social closure between Aboriginal clan groups, and pressure on resources

(Lourandos 1997). The increase in population density (Williams 2013) resulted in more frequent use of zones within territorial area for food and raw resources (Attenbrow 2006:231), and people could not move as freely compared to earlier in the Holocene. It resulted in the development of many traditional practices, such as the advent of fishing with shellfish hooks (Attenbrow 2010b:27), and new trade mechanisms for items such as ground edge axes (Attenbrow et al. 2017:173), and likely restricted access to resources freely available before, such as raw silcrete (White 2018:299-302). It resulted in stylistic regional differences in art, such as the style of eel motifs either side of the Georges River (Attenbrow 2010a:150), and the notion that intensification culminated in the development of complex religious (e.g. Dreaming) systems, and social/hereditary inequality (Hayden 1995; Williams et al. 2015a:12).

Parramatta's Late Holocene economic landscape contained substantial resources and was connected to multiple local traditions. The extent and importance of cultural connections with Parramatta suggests that the cessation in use of some Phase 2 sites is not associated with a reduction in the use of this landscape. Changes evident in the archaeological record at this time could be connected to a range of explanations. Altered accumulations of archaeological materials may have been affected by shifting hydrological regimes (increased overbank flooding). The visibility of the archaeological record may have changed, where increased use of wooden implements may now be archaeologically invisible. Changes to social control may have restricted the number of 'base camps', thereby altering how and where stone artefacts were made, used and discarded. The Burramattagal may have exerted social control and authority over parts of Parramatta, and limited access into the landforms near the wetlands and river.

Both the archaeological record and cultural oral traditions describe Parramatta as an important landscape, at a strategic location on the Cumberland Plain. This study demonstrates the



importance of considering Aboriginal cultural heritage at the landscape level, and that explanations for changes observable in the archaeological record can be intangible. To 'reclaim' Parramatta and present a Deep Time understanding of the place, we have imposed this Aboriginal cultural landscape over the Advocate's bird's eye view image (Figure 9). The river with its saltwater, brackish tidal and freshwater stretches are shown. The tidal reach is clearly defined within this view. Emphasising and redrawing the ridgeline overlooking Parramatta to the south illustrates how colonial settlement

conformed to the slope descending onto the alluvial plain by the river. Earlier wetland areas and PSB landscapes are also indicated. A nominal walking route is drawn through this landscape view at the base of the slope bordering the wetland. Aboriginal sites cluster to the south and east of this area.

Superimposing the Aboriginal Deep Time cultural landscape over the colonial landscape provides an understanding of how Aboriginal culture and heritage is still present and readable within our modern urban centres.



**Figure 9** The southern bank of colonial-era Parramatta, in the '1877 Birds eye view of Parramatta', reclaimed as the Aboriginal cultural landscape. Source: SLNSW a1528440, 'Town and district of Parramatta. New South Wales: Bird's eye view and insets of buildings / engraved by Gibbs, Shallard & Co', modified by Owen and Bowen 2021.

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