CULTURAL HERITAGE CONNECTIONS

Conservation Management Strategy
Singleton's Reserve, Kurrajong, NSW.

By Vanessa Hardy
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Report Prepared for

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1.0 INTRODUCTION

1.1 BACKGROUND CONTEXT

Cultural Heritage Connections Pty Ltd (CHC) was commissioned by Hawkesbury City Council to prepare a document to assist in the management of heritage values for Singletons Reserve, Kurrajong, NSW. The subject land (hereafter 'project area') is Singletons Reserve; a bushland reserve located on Little Wheeny Creek, Kurrajong (see Figure 1).

1.2 PROJECT AREA CONTEXT

The reserve is 21.65 hectares of Crown Land, comprised of Lot 285 and Lot 286 of DP 751649. The land is managed by Hawkesbury City Council for recreational use. Current uses of the area include: bush care, bird watching, walking and horse riding.

The study area contains remains of a water mill established by Benjamin Singleton on Little Wheeny Creek in the early Nineteenth Century.

In 2009, a base-line archaeological survey was conducted by Dr Martin Gibbs with students from Sydney University that located areas of potential remains associated with the mill.

1.3 DOCUMENT OBJECTIVES & CONTEXT

The aim of this document is to provide an initial Conservation Management Strategy (CMS) for the Reserve with particular focus on the remains of the mill site and any associated features. At the time of preparing the mill site did not have any guiding management documentation to address its conservation requirements.

In February 2017, the Draft Conservation Management Strategy was peer reviewed and submitted to the Hawkesbury Heritage Advisory Committee for feedback. A number of comments were received from the Committee and these were incorporated into the final draft document.

The revised document was subsequently exhibited. No comments were received as a result of the public exhibition. This CMS was formally adopted by Hawkesbury City Council at the ordinary meeting held on 29 August 2017.

1.4 STRUCTURE OF CMS

The following section (Section 2.0) of this report provides a summary of the environmental context, the historic and archaeological background to the project area. Section 3.0 looks at the significance of the reserve and the mill. Section 4.0 presents a conservation policy to improve management of the site including actions and timing for review.

1.5 LIMITATIONS AND AUTHORSHIP

No on-ground assessment of Aboriginal cultural heritage within the reserve was undertaken as part of this CMS.

Analysis of the background context, field inspections and formulation of the management strategy were undertaken by Vanessa Hardy (BA Hons), archaeologist and Director of Cultural Heritage Connections Pty Ltd. The report was peer reviewed by Cosmos Coroneos, Director of Cosmos Archaeology.

1.6 ABORIGINAL CONSULTATION

Cultural Heritage Connections recognises that Aboriginal people are the determinants of the cultural significance of their heritage. This is also recognised by OEH who provide a guideline for minimum requirements for consultation with Aboriginal stakeholders (DECCW 2010a) should impact to Aboriginal objects be likely.

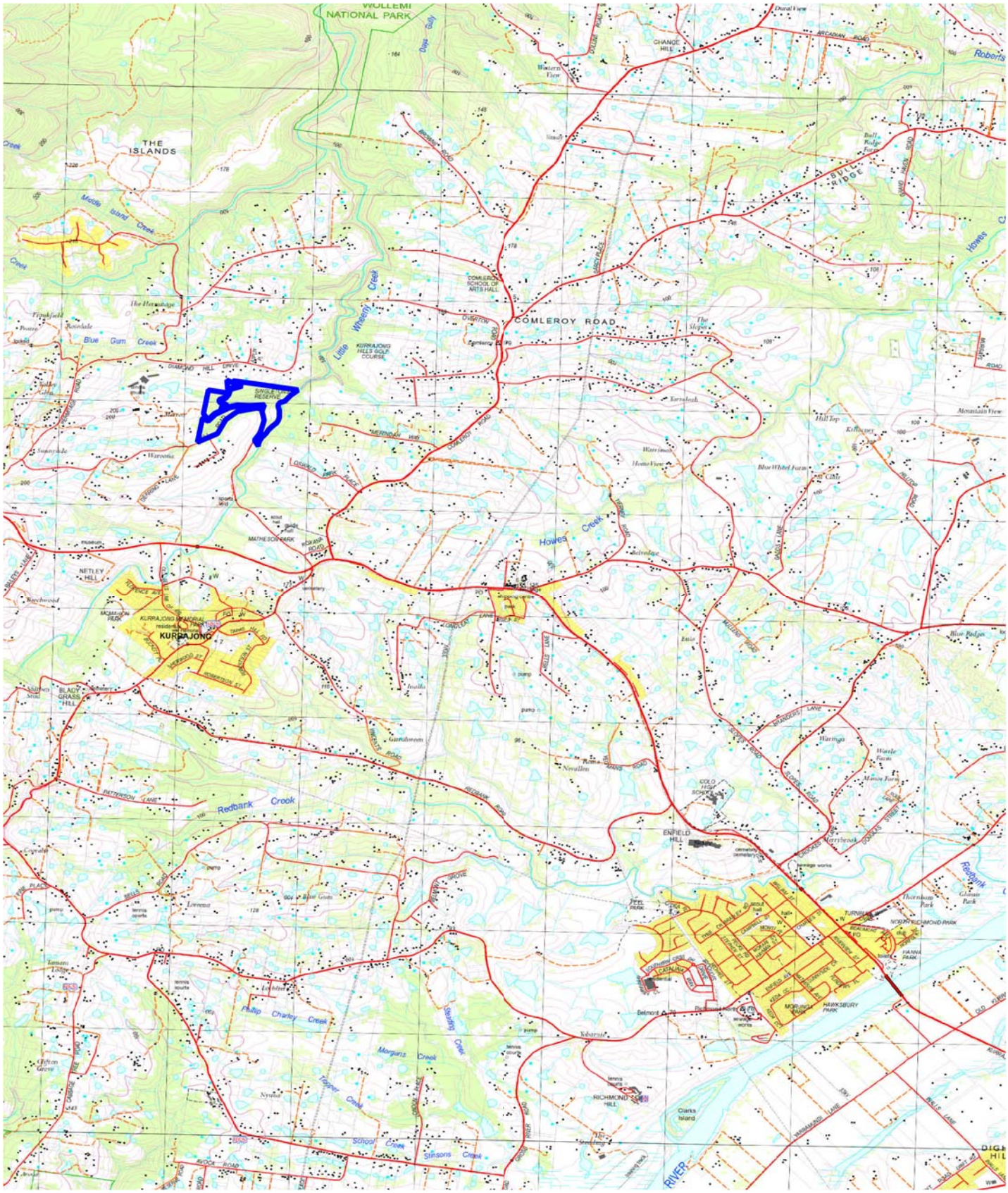
Hawkesbury City Council contacted the following Aboriginal community organisations to invite them to attend a site inspection or provide information relating to the cultural value of the project area:

- Nigel Robinson - Merana Community Aboriginal Association
- Sandra Lee - Darug Tribal Aboriginal Corporation
- Leanne Watson – Darug Custodian Aboriginal Corporation

No response was received.

1.7 ACKNOWLEDGEMENTS

The author is very grateful for the assistance of the Kurrajong-Comleroy Historical Society, particularly: Les Dollin, Frank Holland and Suzanne Smith. Thanks also to Ian Jack, Mary Casey and Craig Johnson for their assistance and information provided.



Source: LPI & Hawkesbury Council

0 0.5 1 1.5 2 km

Figure 1: Study area location

CULTURAL HERITAGE CONNECTIONS

2.0 SITE CONTEXT

The following section presents a brief overview of the project area. It is not intended to be a comprehensive site history; rather it provides a summary of the context of the project area and surrounding region to enable a sufficient understanding for assessing the significance of the project area and to assist in formulating management recommendations.

2.1 ENVIRONMENTAL CONTEXT

The project area is located within the Blue mountains Plateau physiographic region. The Plateau consists of a deeply incised Hawkesbury Sandstone surface overlying Narrabeen sandstone. Narrabeen Group outcrops in some valley floors and occasional volcanic intrusions are also present (Bannerman and Hazelton 1990)

The soils on Little Wheeny Creek are the Gymea Soil Landscape (Hazelton, et al. 1989).The landscape of this soil type is typically undulating to rolling low hills. Slopes range from 10 to 25% with local relief of 20-80 metres. The sideslopes include varying width sandstone benches (10-100 metres) often forming broken scarps (Bannerman and Hazelton 1990). Topsoil (A1 horizon) of the Gymea Soil Landscape is described as loose, coarse, loamy sand to sandy loam, porous with an apedal single grained structure. Its colour can range from brownish-black where high levels of organic matter are present to a bleached dull yellow-orange. Its pH ranges from slightly to strongly acidic. Sandstone and ironstone inclusions are common. Where erosion has occurred underlying clayey sands and sandy clay subsoils can be exposed. Bedrock may also be exposed.

On crests up to 30 centimetres of A Horizon generally overlies bedrock or B Horizon soils. Sideslope soils are discontinuous and rock outcrop may be present. Up to 30 centimetres of A Horizon is commonly present on the inside and outside of benches (Bannerman and Hazelton 1990).

Within the project area, Wheeny Creek is a higher order creek with reliable water flow.

2.2 ABORIGINAL HERITAGE CONTEXT

It is generally accepted that the earliest Aboriginal habitation of Australia dates back at least 60,000 years. Occupation patterns would have changed through this time. For the purposes of determining settlement and site location patterns, archaeologists examine regional and local trends in the distribution of known sites in relation to environment and topography. This provides evidence about economic and social systems in the past and also assists archaeologists in predicting likely site types, site locations and the nature of the archaeological resource in any given area. It is not always possible to reconstruct the boundaries of different groups in a given area and this would have changed through time.

The project area has been described as within the land traditionally occupied by the Darug speaking people. It is thought that the hinterland dialect of Darug (as distinct from the coastal dialect spoken around Sydney) included local clans on the "Cumberland Plain from Appin in the south to the Hawkesbury River in the north west of the Georges River, Parramatta, the Lane Cove River and Berowra Creek" (Attenbrow 2002: 34). Other research (Ford 2010) has suggested that the area might have been part of the land of the Darkinjung speaking people.

In general, resource and land ownership was focused, not on language groups, but on extended family groups or clans. Group borders were generally physical characteristics of the landscape inhabited, such as waterways or the limits of a particular resource. Groups also shared spiritual affiliations, often a common dreaming ancestor, history, knowledge and dialect. There are some recordings of a local clan group called Kurrajong (http://www.sydneybarani.com.au).

Due to the difference in resource availability between the coastal and inland areas, it is frequently assumed that hinterland and coastal groups had very different lifestyles; in summary, coastal people were 'fishers' and inland people were 'hunters'. This has not always matched evidence in archaeological excavations that suggests that coastal people also exploited a wide range of terrestrial resources, and hinterland people had a variety of riverine resources available for exploitation.

Some lifestyle differences relating to resource availability were inevitable. Groups inhabiting Hawkesbury Sandstone topography were able to use sandstone overhangs as shelter. Elsewhere, bark huts were common. Collins described huts "made of the bark of a single tree bent in the middle and placed on its two ends on the ground" (Collins in Kohen n.d.). Watkin Tench also gave details of bark huts constructed with pieces of bark placed together to form a low shelter like an 'oven' open at one end and large enough to fit one person lying down (Tench 1996: 56). There is some evidence that coastal groups would travel long distances, even as far inland as Parramatta, to find trees with suitable bark for canoe manufacture (Kohen n.d.).

Other plant processing techniques also enabled people to broaden their range of food resources. Various types of yams and roots were important food items, generally abundant and predictable. Yams could be found in large numbers often along the alluvial terraces of larger waterways (Hunter in Martin 1986: 45). An interesting observation was made by Hunter, who became violently sick trying to eat a poisonous yam (possibly *Dioscorea bulbifera*). Hunter had seen Aboriginal people digging the same yam and concluded, "They no doubt have some way of preparing these roots, before they can eat them". It is also known that the poisoned fruits of the burrawang were processed to remove the poisons before being pounded to flour and baked (Kohen n.d.: 3). Knowledge of correct processing and management of plant resources was of great importance in the lifestyle of Aboriginal people.

Elements of the social life of Aboriginal people in the area have also been recorded in a variety of sources. The ethnologist R. H. Matthews recorded information relating to the languages, social organisation and ceremonial life of the Gandangara, Tharawal and Darug peoples (Martin 1986). Gatherings of dispersed groups would occur at times for ceremonies or to share in seasonally available resources (Attenbrow 2002). Regular interaction between groups is likely to have occurred and resources, technologies and other knowledge would have been exchanged. This interaction would have varied according to seasons and resource availability. Within the region, elements such as art motifs, technology and resource use occur across a wide area suggesting that interaction and exchange would have been regular and ongoing (McDonald 1992). The project area is within the present day boundaries of the Deerubbin Local Aboriginal Land Council (LALC).

Archaeological investigation in the region goes back to the 1930s. A rock shelter site at Lapstone Creek, southwest of Emu Plains, was excavated in the 1930s and base levels

subsequently dated to around 4,000 years ago (Nelson 2007). This site along with others studied by McCarthy (amongst others) were important in helping to establish the 'Eastern Regional Sequence' of artefacts that has been used for 'relative' dating of sites where direct methods such as Carbon dating cannot be applied. McCarthy also recorded several surface scatters along the banks of the Hawkesbury River between Castlereagh and Emu Plains. The surface scatters were estimated to date to the late Holocene (the Holocene being approximately the last 12,000 years).

The Eastern Regional Sequence was based on direct dating of excavated sequences. The broad categories have been added to and refined over time. The timing of the various phases has also been refined specifically in light of archaeological data from the Sydney region (Jo McDonald CHM 2005). There is still some debate about the precise nature and significance of the technological changes described in the sequence. The named phases are described in Table 1.

Table 1: Eastern Regional Sequence

Pre-Bondaian (Capertian)	Before 9,000 BP	Preference for the use of silicified tuff, unless too great a distance from sources when augmented with quartz and unheated silcrete. Also grainy stone materials. Cores and tools vary widely in size, some quite large. No backed artefacts, elouera, or ground stone. Unifacial flaking predominant technique, bipolar flaking rare.
Early Bondaian	4,000 to 9,000 BP	Preference for the use of silicified tuff declines and more use is made of local stone materials, especially at sites occupied for the first time. Backed artefacts appear sporadically. Bipolar flaking widely in use but rarely at individual sites. Presume that unifacial flaking continues as predominant technique.
Middle Bondaian	1,000 to 4,000 BP	The use of different raw material types varied between sites, and within sites over time. Main phase of backed artefacts and introduction of asymmetric alternating flaking. Substantially smaller cores and tools. Bipolar flaking increases. Ground stone artefacts appear, though infrequently and present at fewer than half the dated sites. Elouera present but rare.
Late Bondaian	1,000 years BP to contact	The use of different raw material types continued to vary. Backed artefacts decline, becoming rare or absent from most sites. Bipolar flaking techniques at most sites. Ground stone at most dated sites in low frequencies. Elouera continued to be present but rare.

Stockton and Holland (1974) excavated several rock shelters in the Blue Mountains during the 1970s. The sites included Kings Tableland, Walls Cave, Lyrebird Dell and Springwood Creek. Initial occupation of the region suggested by these excavations was around 22,000 years. The Capertian assemblage dominated between 12-6,000 years and a Bondaian between 3,000 and the European arrival (Williams, et al. 2012). At many sites there appeared to be a gap in the habitation between the two periods of activity.

The earliest occupation date proposed for the region is from Cranebrook Terrace. This site, initially identified by Stockton, was subsequently dated to approximately 40,000 years old. However the dating at the site is disputed. There is question as to whether the artefacts were in situ within the dated deposit.

Two sites at Shaws Creek, near the Hawkesbury River, were also useful in further defining the archaeological pattern of the area. Two main assemblages were identified: an older grouping of core/flake tools and thick flakes predominantly of tuff; and a more recent assemblage with volcanic and other stone as well as an increasing percentage of silcrete. The upper assemblage also included a wider variety of artefacts including backed blades, microliths and edge ground axes. Dates suggest that the lower deposit has a minim age of 13,000 years ago with the upper dated between 4-1.2 thousand years ago. Dates on a site within a levee next to the Hawkesbury River near Pitt Town confirm the two oldest assemblages as dating to around 15 and 11 thousand years with pre Bondaian characteristics of pebble tools taken from river cobbles. The most recent assemblage (<5,000 years) included backed blades and a more varied tool kit.

Archaeological excavations of 26 square metres up to depths of 180 centimetres at Windsor Museum recovered over 12,000 'lithic items'. Material recovered included mudstone (68.7%), silcrete (13.8%) and quartz (7.6%). Most of the artefacts were unmodified flakes, with one grindstone also recovered. The assemblage contained no backed artefacts. The deposit was believed to be an intact Pleistocene sand dune (Aeolian deposit). Thermoluminescence dating of the deposit from artefact bearing layers was dated to between 8,500 +/- 800 years to 33,900 +/- 1,700 (KNC 2012: 9-10).

It appears that sand sheets along the Hawkesbury River are potentially highly significant. Elsewhere, the majority of sites recorded in the region date to within the last 4,000 years, although it is noted that only a handful of sites have been dated (Williams, et al. 2012: 85).

A search of the OEH Aboriginal Heritage Information Management System (AHIMS) database was undertaken on 23/06/2016 for an area of datum: GDA, Zone: 56, Eastings: 278000 – 288000, Northings: 6282000 – 6292000. Within this area, a total of 26 Aboriginal site locations have been recorded. This includes the entire project area and adjacent lands Figure 2 shows the approximate locations of the recorded sites. There are no recorded Aboriginal sites within the project area.

It is important to note that the absence of sites does not mean no sites are present. Sites are usually only recorded as part of specific studies and where locations have not been subject to archaeological survey there may be unrecorded sites present. The location information for sites recorded within the AHIMS is subject to variation in recording methods. Coordinates provided are often indicative rather than exact. The accuracy of locations cannot always be relied on. The author cannot vouch for the accuracy of the information provided by OEH or other agencies.

Table 2 provides a summary of the site types listed on AHIMS. The most common site types are artefact scatters and grinding grooves. A summary of the site types is given in Appendix 1.

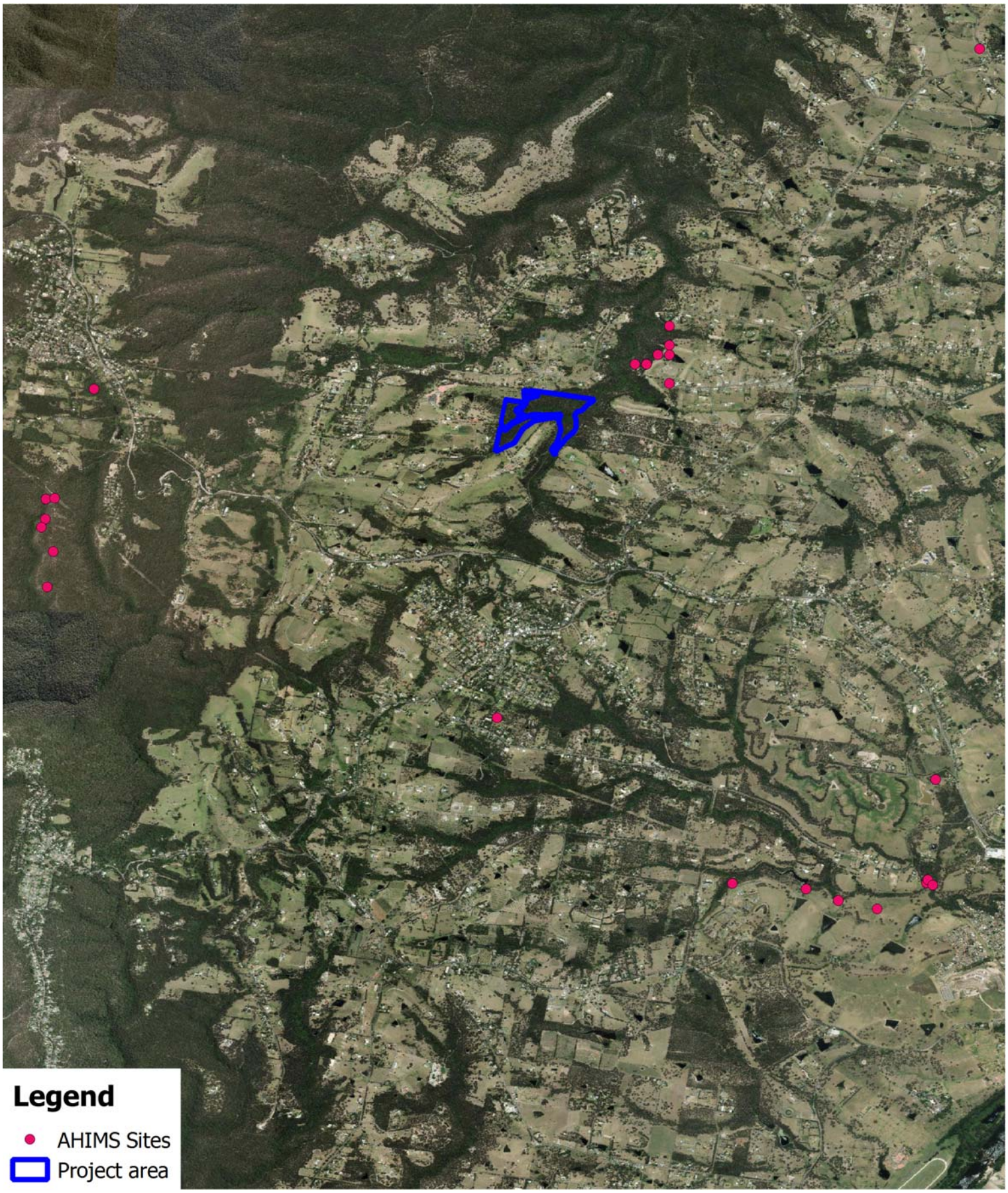
In general it can be said that Aboriginal people have inhabited the project area region for many thousands of years. Throughout that time occupation patterns and use of the landscape would have changed as resources changed, however the project area region had

sufficient resources to successfully sustain Aboriginal groups. The most likely site types that could be present within the project area include:

- artefact scatters, either in the open or within sandstone overhangs, if present;
- grinding grooves in areas of suitable stone outcrop along the creek;
- scarred trees are not highly likely due to previous clearing of the area, but could be present if trees of sufficient age survive in the project area; and
- art sites if sandstone overhangs are present.

Table 2: Site features from AHIMS results

Site Feature	Frequency	Approx %
Art & PAD	2	7
Art	1	4
Artefacts (7 open sites, 4 isolated artefacts & 3 shelters with deposit)	14	54
Grinding grooves	8	31
Artefact (open camp site) with grinding grooves	1	4
Total	**26**	**100%**



Source: OEH, LPI & Hawkesbury Council

0 0.5 1 1.5 2 km

Figure 2: AHIMS sites within the project area locality

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2.3 HISTORIC CONTEXT

The history of the Reserve and the mill site following non-Aboriginal arrival in the area includes a number of uncertainties. There are no historic plans of the locations of particular features and there is some contradiction in the secondary sources with many based on recollections taken down many years after the fact. The aim of this section is to provide a context for the assessment of the significance of the project area and the mill site specifically, to enable appropriate management recommendations to be formulated.

Benjamin Singleton arrived in 1792 as a young child with his mother and brother Joseph as free settlers on the ship the *Pitt* along with his father William, a convict. An older brother, James arrived in 1809. It was around this time that Benjamin (probably with James) built a water mill on Little Wheeny Creek (Barkley & Nichols 1994).

It is estimated he built this as early as 1810. By 23 March 1816 Singleton's mill was being advertised for sale in the *Sydney Gazette and NSW Advertiser* as "a complete overshot water mill, and 100 acres of good land, known by the name of the Kurrajong Brush… being built on the Winney [sic] Creek. The farm was said to be bounded by the creek to the east and the mountains to the west and the mill was "capable of grinding 40 bushels of wheat daily, and from there being no mill within a considerable distance, it will have constant work". The mill wasn't sold but was let to John Town up until 1819 (Johnson 2014). Following a forced sale by the Provost Marshal the mill was bought by William Hutchinson, Daniel Cooper, George Williams and William Leverton in 1819. These four were also in co-partnership with at least two other men, in the 'Lachlan and Waterloo Flour Mills'. William Leverton died in 1824 and the mill was auctioned and again rented by John Town. At that time it was described as having an adjacent weatherboard house and a pair of French burr mill stones (Barkely and Nichols 1994). This mill has been called the 'upper' mill, presumably because it was up stream of the other mill built on the creek.

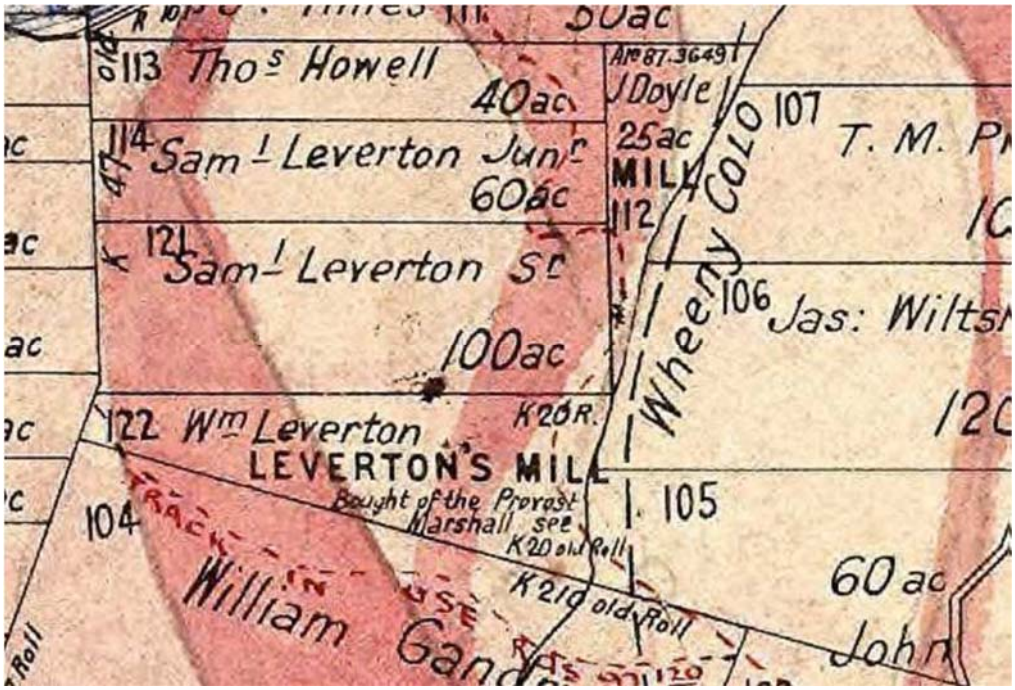
In 1820 as recorded in his request for a land grant Samuel Leverton was said to be renting a mill on Little Wheeny Creek. It is not certain which mill this was.

In 1833 "A Return of Manufactories, Mills, Machinery, Mines, and Quarries, in the Districts of Hawkesbury" was compiled for the Colonial Secretary. It shows that a total of nine mills were operating in the district including two listed at Kurrajong, owned by John Town (Proudfoot 2007). It is not certain when the second mill was built, but likely before 1824 as two mills were recorded in the Sydney Gazette (Barkley & Nichols 1994).

The southernmost mill site ('upper mill') was reported to be an overshot mill and called the 'Speedwell'. The other site ('lower mill') was an undershot mill called the 'Wellington' (Les Dollin pers com).

The Parish Map from 1893 (Plate 1) for the area is based on earlier maps of land grants and shows grants including two mill sites one showing as 'Leverton's mill' (William Leverton) and that it was bought 'of the Provost Marshall'. The second site north along Wheeny Creek is labelled 'MILL' and J Doyle 25 acres. Samuel Leverton Senior and Junior have adjacent land parcels. The current project area and nearby cadastral information was overlaid on the Parish Map and is shown in Plate 2. This demonstrates that the 'Leverton's mill' site is outside the current boundaries of Singleton's Reserve. This suggests that the mill site within the reserve (the 'lower mill') is the one constructed second.

Plate 1: 1893 Parish Map extract (LPI)

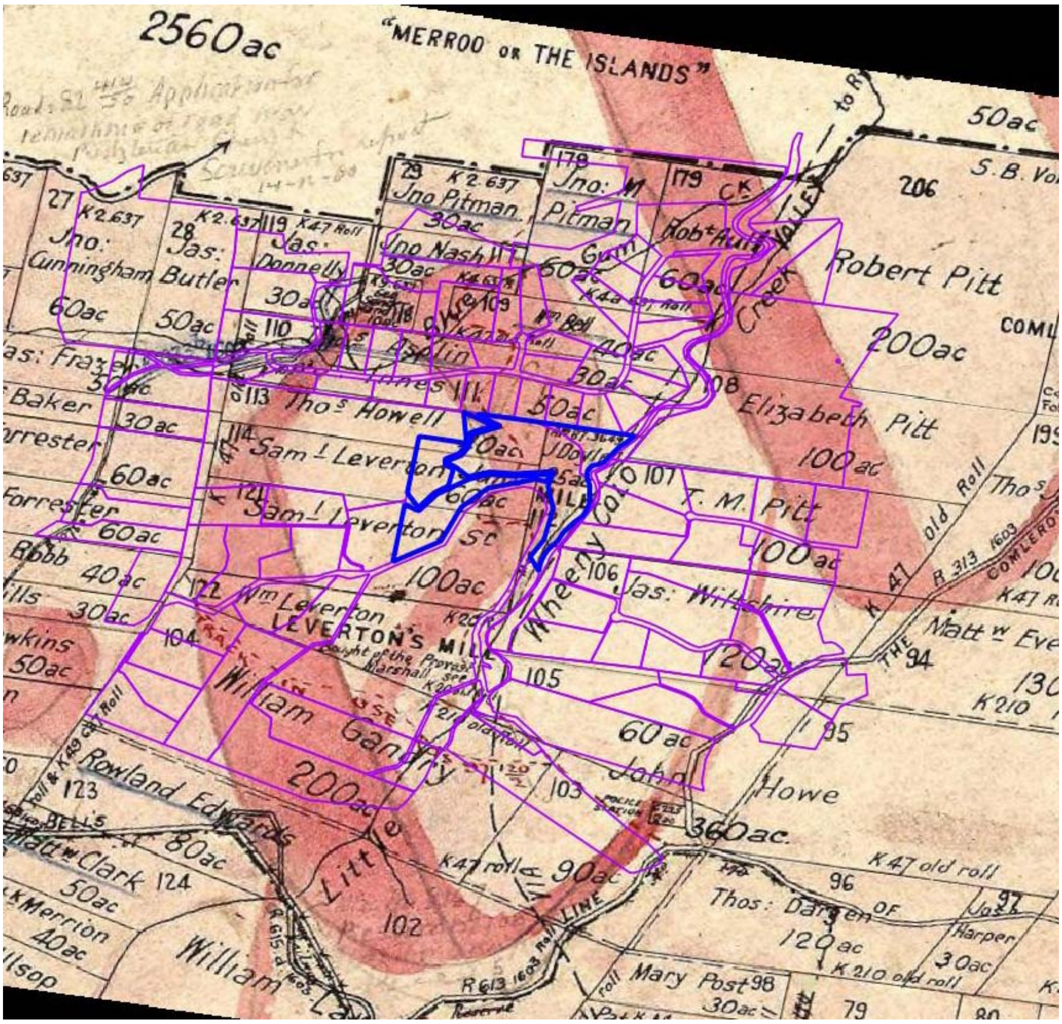


A description of the mill from 1842 includes a single pair of French burr millstones, a smutting machine and a dressing machine (Johnson 2014). It has also been suggested that while under the ownership of John Town a 'fine six-roomed house' was erected next to the bottom mill (*Windsor and Richmond Gazette* 3 November 1922 p14.) the remains of which were still visible in 1922.

A number of different owners operated the mills until around 1858 when they appear to have ceased operation. Even after this, the area would have been used for different activities. It is interesting to note that the archaeological excavations of Bagot's mill at Ben Lomand in the New England region Connah (1994) found that most of the archaeological deposit related to uses of the mill buildings following its closure as a mill. It appears there may have been a fire or other event at Wheeny Creek that damaged the lower mill and house in 1902.

The area began to be claimed for a soldier settlement in 1919. Presumably at this time parts of any structures and other materials that were remaining may have been taken and reused. The *Windsor and Richmond Gazette* also records that two millstones were recovered from the area and re-used as part of a war memorial as the base for a machine gun. Although one was a top and one a 'nether' stone they were not a pair. It was assumed that the upper stone that was dug out of the creek when excavating for a bridge was from the top mill and the lower stone found 'buried below the second dam site' was from the lower mill. Various owners are recorded in the 1920s and 30s. The Reserve appears to have been returned to Crown Land to be used for recreation sometime in the 1930s.

Plate 2: Modern cadastral information on 1893 Parish Map (project area in blue)



2.4 ARCHAEOLOGICAL CONTEXT

The site was visited twice as part of the preparation for this CMS. The remains of the millrace and other features were inspected. No detailed archaeological recordings were made. The following section presents a summary of recording done by students at University of Sydney under the supervision of Dr Martin Gibbs (Anderson and Corbett 2010). It appears that at the time of the University of Sydney recording ground visibility conditions were more favourable than when the site was inspected for the CMS. Some areas where features were recorded in Anderson and Corbett's report were no longer visible due to heavy vegetation cover. However guidance from Les Dollin enabled GPS recording of the feature locations. The Sydney University report is included as Appendix 3. The features discussed below as mapped in the Sydney University report are shown in Plate 3. Archaeological features observed during the site inspections for this CMS are shown in Figure 3. Areas that appeared to be associated with quarrying stone were also present.

The archaeological survey and recording undertaken in 2010 identified four separate areas associated with the lower mill site, namely:

1. The mill pond

Referred to in the report (Anderson and Corbett 2010) as the 'dam', this area consists of apparently deliberately cut boulders bounding "a sloping open space on the west bank" of the creek. There are also the remains of a stone wall presumed to be the end of the mill race. A pond or dam would have been required to address the inconsistency of water flow and would have been an essential part of any mill. It is likely this is the location.

There are no remains of any wall or weir structure damming the creek. It is likely that any structure has been destroyed through deliberate removal and/or water activity.

2. The mill race

The mill race is described as - "approximately 200 metres long and consists of a channel dug into the side of a natural hill at varying elevation". It was also noted that the ends of the channel are now indistinct and it is difficult to gauge its original depth due to the present day compacted soil. This was confirmed in the recent inspections undertaken by the author. The race would have been lined, presumably with timber although no trace of this was located. It is likely that slope wash has deposited soil within the base of the original race. Parts of the dry stone wall that forms the wall of the race are eroded. In some areas vegetation growth appears to be threatening the stability of the wall as can be seen in Plate 4.

3. Mill site (lower mill)

The site thought to be the mill location is on the west bank of Little Wheeny Creek. There are two areas of eroded stonework and evidence of disturbance. Mounding and dips in the natural ground surface area present suggesting there has been modification or some activity in the area. Much of the area is currently overgrown. The Sydney University Study notes

> *One section of stonework is positioned at the base of the slope, close to the creek. The other is further up the slope and consists of two large, flat pieces of sandstone which possibly define the two corners of a structure. The earth behind these stones forms a relatively flat 'terrace'. Immediately beside this possible structure (to the northwest) is a slight depression, followed by a dirt mound and then a large erosion gully which leads directly into the creek. It is possible that this gully originally functioned as an outflow channel, returning water used in the mill to Little Wheeny Creek.*

4. Possible settlement site

This is an area between the millrace and the modern road. Mapping of the area by Sydney University students includes several areas of stone and soil mounds some exposed flat stone and some cut stone. They also noted some artefacts including glass bottles, bricks and a door hinge. At the time of inspection for this CMS the mounded and flat areas were visible despite vegetation cover.

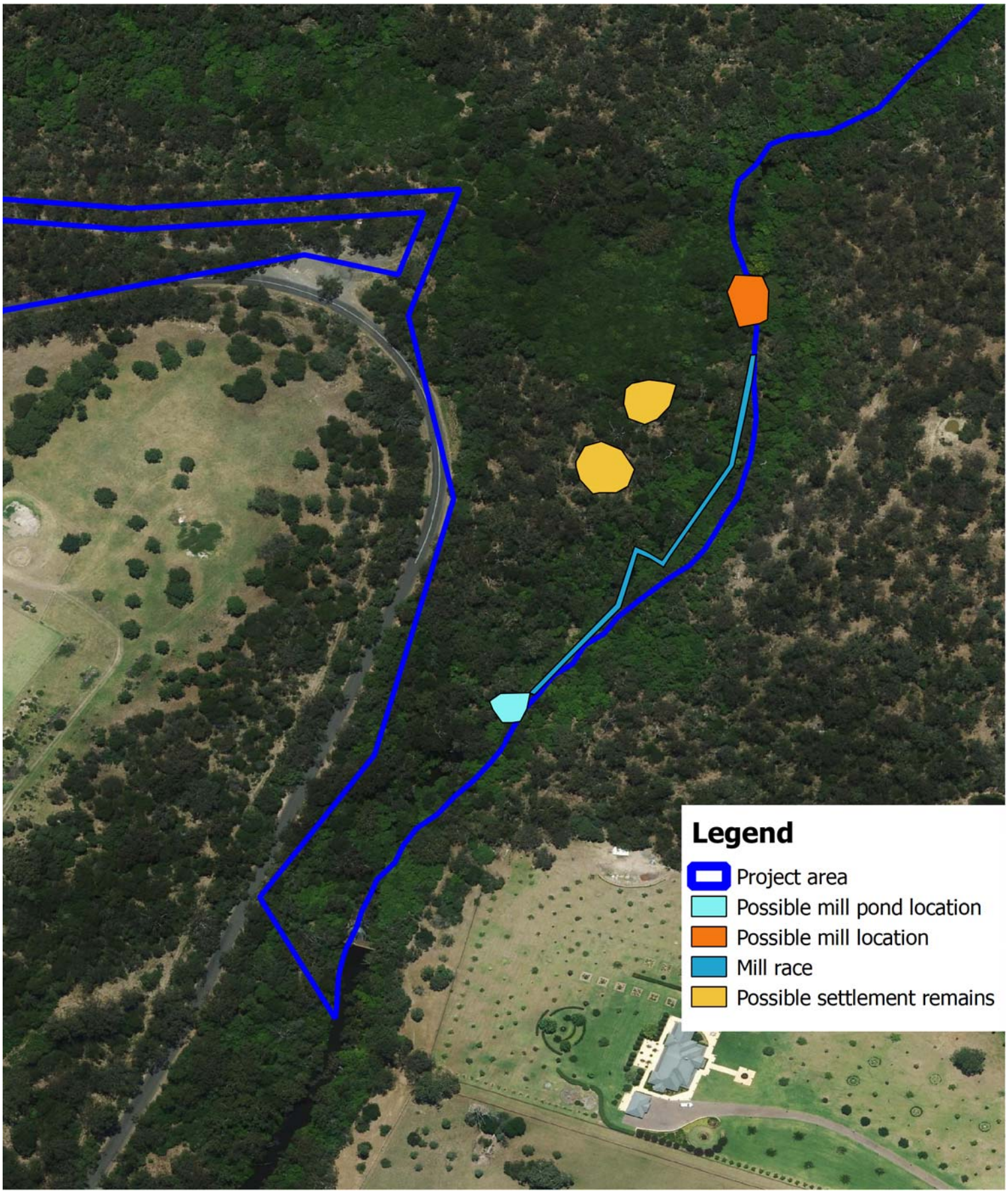
Additional notes

Despite it being outside the project area, an inspection of the area likely to have contained the earlier or 'upper' mill was undertaken. No physical evidence to confirm the mill location was observed. The Sydney University study concluded that the lower mill site

complex has 'enormous' research potential. The relatively intact nature of the millrace wall and the potential for associated buildings and dwellings provide an opportunity to investigate a number of historic themes of importance to the history of the area and the State of NSW. A contextual history and summary of historic themes is presented below.

Plate 3: Location of features observed (Anderson & Corbett 2010: 2)

Plate 4: Trees growing within the mill race wall structure



Source: LPI & Hawkesbury Council & survey recording

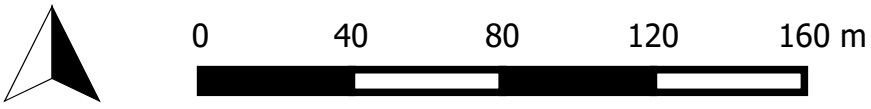


Figure 3: Location of archaeological features

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2.5 SITE COMPARISONS & HISTORIC THEMES

In order to understand the significance of the archaeological remains of the mill site a brief consideration of the development of mills in Australia in the early Nineteenth Century and comparable sites is presented.

When the first fleet arrived they brought with them two pairs of millstones but no one with adequate experience in building mills. The history of attempts to establish mills in the early colony has been extensively discussed elsewhere (eg Tatrai 1994; Pearson 1996; Jackson 2016). Once wheat crops were established, finding efficient ways to grind flour became vitally important for the colony's survival. Bread was seen as an essential dietary item. The hand grinders that had accompanied the fleet could not keep up with demand and quickly wore out. A treadmill was built in 1793 but was primarily a punishment system. The first water mill and windmill in the colony were built on Norfolk Island in 1795. The convict Nathaniel Lucas had some experience in mill building and was involved in the construction of the mills (Jackson 2016, Tatrai 1994). When he returned to Sydney he brought two pre-fabricated windmills with him. The earliest mills on the mainland were constructed in Millers Point in Sydney in 1797 and shortly afterwards in Parramatta (Jackson 2016). There are plans for future excavations at Parramatta to determine whether remains of mills there can be located (Mary Casey pers. comm.).

In the early 1800s private mills began to increase. Jackson (2016: 22) notes that by the 1830s up to 19 "post, tower and smock windmills" had been built; although nothing of them now remains. Water mills were generally less successful that windmills. Initial attempts to replicate the technology of England without knowledge of the new environmental conditions and without adequate expertise in mill construction led many mills to fail. Sydney did not generally have suitable locations and two early mills at Parramatta failed due to lack of technical ability by 1803. In the following decade things improved and successful mills were built at Parramatta, North Rocks, in the Hunter and in the Illawarra (Jackson 2016: 23). From the 1820s the number of mills grew rapidly and there was reported to be 26 water mills on the Hawkesbury River (Tatrai 1994: 35).

Johnson (2014) identifies 13 mill sites in the Hawkesbury agricultural district. Of these only four retain any known remains. Of the four; the windmill at Cattai is on the State Heritage Register (SHR) and the tidal mill built by James Singleton at Wisemans Ferry is listed on the State Heritage Inventory (SHI) for locally significant items. The third site is the remains of a horse drawn mill at Clarendon. The fourth is the Kurrajong mill site. This makes Singleton's Kurrajong mill the only know water mill with archaeological remains surviving in the region.

The Wisemans Ferry mill was built around 1820. There are also two other mills built in the vicinity. Remains still present include a "rendered masonry wall, formation of the inset for the mill wheel, [and] the stone edge wall to the creek" (Johnson 2014).

Other water mills from the early part of the Nineteenth Century have been recorded. As part of his Honours thesis, Greg Jackson located the sites of two mills built by John Lucas (the son of Nathaniel Lucas) on the Georges and Woronora Rivers (Jackson 2016). Both mills were timber construction built on a freshwater stream near the tidal confluence.

The Brisbane Mill was built in 1822 and is located on Williams Creek approximately 1.7 kilometres upstream from its junction with the Georges River. The remains visible at the time of Jackson's survey include "unworked stones bonded with mortar/concrete", a

hand cut rock channel that was most probably part of the mill race, the remains of an overflow channel and some other modifications to the surface rock (Jackson 2016: 36-42).

The Woronora mill is located on the Woronora River. It was built in 1825 and operated until Lucas was declared bankrupt in 1828. It was reported as destroyed by fire by 1843. The remains at the site include modifications to the bedrock in the River, deposits of 'cement' and aggregate dating to the period and some evidence of the dam wall. There are also nearby remains of huts. These may be related to depression era housing known to have existed in the vicinity. Jackson (2016) suggests they may date to an earlier period and may even be related to the time of the mill. It was also assessed that the archaeological potential of the Brisbane mill was limited due and that flooding would have likely removed any intact deposits. The Woronora mill site its self was not assessed as having potential for further archaeological deposit although it was assessed that the associated hut sites were worth investigating.

The windmill at Cattai, mentioned above, was subject to archaeological excavation along with the associated granary and cottage. The exact date of construction is unknown but is most likely to have been between 1804 and 1809. It is not certain whether the mill ever operated and was 'almost certainly' abandoned by around 1850 (Gojak 1996). At the time of excavation part of the mill was still standing. Excavation revealed a variety of artefacts and information relating to the development of the site. The archaeology contributed to the information used to the development of what is potentially the oldest surviving industrial development in NSW. The site is of State significance and listed on the SHR.

In general, the majority of the evidence of NSW mills has been lost. Those that do remain mostly date to the second half of the Nineteenth Century. The evidence at Wheeny Creek has the potential to contribute to our knowledge of these early industrial sites that were so important to the developing colony.

Study of mills can contribute to our knowledge of technological adaptations and social issues associated with industrial production (Jackson 2016). The sites also have potential to reveal subsequent uses (cf Connah 1994). No investigation at Singletons Reserve has looked at the potential for sites associated with the soldier settlement. This could be an area for future research. Research questions for the mill site and the Reserve in general can be categorised into various themes. A summary of the National and State themes applicable to the project area is presented in Table 3. The information set out above and the historic themes are used to develop the assessment of the significance of the project area detailed in the Section 3.0.

Table 3: Historic Themes

National Theme	NSW Themes	Comments
Developing local, regional and national economies		
	Industry	Early industrial sites such as the mill site provide an opportunity to study the technical capabilities of the early European settlers and the nature of work undertaken in the colony. Many such sites have been completely destroyed making those that survive more valuable.
	Technology	Knowledge of mill construction and operation is a very specific skill. The evidence of many failed early mills in the colony and the efforts to keep up with food supply is an important aspect of the State history.
Building settlements, towns and cities		
	Towns, suburbs and villages	The vicinity of the mill site was settled by approximately 1810. There was at least one pub in the vicinity and there would have been associated dwellings. There may be remains of some habitation huts/houses associated with the mill. The mill would have provided a focal point for local activity as grain was brought in and flour taken out. There is potential for there to be material present within the project area that could contribute to our understanding of the history of the area. There is also some potential for remains associated with later uses such as the soldier settlement.
Marking the phases of life	Persons	Singleton associated with mills and he explored the route to the Hunter Valley. In 1821 he received a grant at Patrick's Plains The town of Singleton was built on part of his grant and named after him.

3.0 SIGNIFICANCE ASSESSMENT

The Australia ICOMOS *Burra Charter* 2013 provides a best practice framework for the assessment, conservation and management of places of cultural significance. Cultural significance is defined in the Burra Charter as 'a concept which helps in estimating the value of places'.

The Burra Charter defines 'cultural significance' as "aesthetic, historic, scientific, social or spiritual value for past, present or future generations".

It also notes that cultural significance "is embodied in the place itself, its fabric, setting, use, associations, meanings, records, related places and related objects. Places may have a range of values for different individuals or groups".

3.1 CRITERIA

For assessing heritage places in NSW the Heritage Council provides the following criteria for assessing significance:

Criterion (a) An item is important in the course, or pattern, of NSW's cultural or natural history (or the cultural or natural history of the local area);

Criterion (b) An item has strong or special association with the life or works of a person, or group of persons, of importance in NSW's cultural or natural history (or the cultural or natural history of the local area);

Criterion (c) An item is important in demonstrating aesthetic characteristics and/or a high degree of creative or technical achievement in NSW (or the local area);

Criterion (d) An item has strong or special association with a particular community or cultural group in NSW (or the local area) for social, cultural or spiritual reasons;

Criterion (e) An item has potential to yield information that will contribute to an understanding of NSW's cultural or natural history (or the cultural or natural history of the local area);

Criterion (f) An item possesses uncommon, rare or endangered aspects of NSW's cultural or natural history (or the cultural or natural history of the local area);

Criterion (g) An item is important in demonstrating the principal characteristics of a class of NSW's

- cultural or natural places; or
- cultural or natural environments.

(or a class of the local area's

- cultural or natural places; or
- cultural or natural environments.)

It is important to note that an item can be listed on the Register regardless of whether items with similar characteristics have already been listed. In many cases, heritage items will be significant under only one or two criteria (NSW Heritage Office 2001; Heritage Branch 2009). The above criteria are applied to both the mill site complex specifically and

to Singleton's Reserve as a whole in Section 0 below. A summary of the significance rankings for each criterion is presented in Table 4.

3.1.1 Assessing Archaeological Significance

The significance of archaeological sites and relics is linked directly to archaeological (or scientific) research potential. A site is scientifically significant when "its further study may be expected to help answer questions" (Bickford and Sullivan 1977). Heritage Division guidelines use the following questions as a guide for assessing the research potential of an archaeological site within a relative framework (Heritage Branch 2009:10):

1. Can the site contribute knowledge that no other resource can?
2. Can the site contribute knowledge that no other site can?
3. Is this knowledge relevant to general questions about human history or other substantive questions relating to Australian history, or does it contribute to other major research questions?

The emphasis in these three questions is on the need for archaeological research to add to the knowledge of the past in an important way, rather than merely duplicating known information or information that might be more readily available from other sources such as documentary records or oral history.

3.2 ASSESSMENT

Criterion (a) an item is important in the course, or pattern, of NSW's cultural or natural history (or the cultural or natural history of the local area)

The mill remains are an early example of technology that was of vital importance to the new colony. Without a secure food supply the colony was likely to fail and securing a means to process grain locally without relying on imported food was vital. As an example of an early Nineteenth Century water mill with archaeological remains it has research potential to contribute our understanding of the pattern of the development of the use of technology across the state.

Singletons Reserve has local value in demonstrating the progression of land title from private land grants through to a soldier settlement and a Crown Land reserve. It shows the changing use of land in the local area.

Criterion (b) an item has strong or special association with the life or works of a person, or group of persons, of importance in NSW's cultural or natural history (or the cultural or natural history of the local area)

The mill site is associated with Benjamin Singleton who was a significant figure in the development of the colony of New South Wales. He was involved in exploration to the Hunter Valley and is remembered in the name of the Hunter Valley town. The mill site has significance at a State level for its association with the Singleton family and the potential to further reveal the contribution that Benjamin and his brothers made by operating mills and assisting with the important task of securing the food supply for the colony.

Singletons Reserve has local value for its association to the earliest non-Aboriginal inhabitants of the area. The early period of settlement at Kurrajong included the land of

the Reserve and adjacent areas. There is also some potential for research relating to the soldier settlement in the area.

Criterion (c) an item is important in demonstrating aesthetic characteristics and/or a high degree of creative or technical achievement in NSW (or the local area)

The mill remains demonstrate that the technical knowledge required to build a successful mill should not be underestimated. The setting of the dry stone wall of the mill race alongside a creek also is aesthetically pleasing and has local value.

The Reserve as a whole has aesthetic value at a local level. Sandstone outcrops and native vegetation provide a pleasant backdrop to the walking tracks and trails that are used by the local community.

Criterion (d) an item has strong or special association with a particular community or cultural group in NSW (or the local area) for social, cultural or spiritual reasons

The mill site has importance for the local community and in particular members of the Kurrajong Comelroy Historic Society. Some members of the Society have undertaken extensive research relating to the site and have a keen interest in its preservation. Members of the society have regularly held information events and tours that have been well attended. The millstones retrieved from the area form part of a public display in Kurrajong and a depiction of them is used as the Historic Society's logo.

Singletons Reserve is valued by the local community as public open space and is used for a variety of activities including bird watching, walking, bush care and horse riding. The naming of it strengthens its connection to the Singleton family and the mill remains contained within it.

Criterion (e) an item has potential to yield information that will contribute to an understanding of NSW's cultural or natural history (or the cultural or natural history of the local area)

The mill site's archaeological potential is not yet fully understood. It is possible dwellings associated with the mill may be present in the vicinity. The site may have value in that it could help provide information, unavailable elsewhere, to understand early settlement in Kurrajong and the nature of water mill technology in the State. No other known site in the State contains undisturbed areas with potential for containing mill buildings associated with a water mill of this period. The millrace is also the most complete one known to have survived of the pre 1820 time period. Therefore, it has the potential to address questions no other source can.

Singleton's Reserve outside the area of the mill complex remains may have potential to contain information relating to other uses of the area, for example the soldier settlement that could be of local value.

Criterion (f) an item possesses uncommon, rare or endangered aspects of NSW's cultural or natural history (or the cultural or natural history of the local area)

Singleton's mill appears to be the only water mill with physical remains within the Hawkesbury district and one of only a handful in the State. As such it is of exceptionally high value.

The remainder of the Reserve does not appear to contain elements that meet this criterion.

Criterion (g) an item is important in demonstrating the principal characteristics of a class of NSW's (or a class of the local area's)

- *cultural or natural places; or*
- *cultural or natural environments.*

Without sufficient other water mill sites to compare or further investigation it is difficult to determine the representative value of the mill site complex.

The Reserve would not appear to meet this criterion.

Table 4: Summary of significance

Criterion	Mill Site	Singletons Reserve
a - An item is important in the course, or pattern, of NSW's cultural or natural history (or the cultural or natural history of the local area)	State	Local
b - An item has strong or special association with the life or works of a person, or group of persons, of importance in NSW's cultural or natural history (or the cultural or natural history of the local area)	State	Local
c - An item is important in demonstrating aesthetic characteristics and/or a high degree of creative or technical achievement in NSW (or the local area)	Local	Local
d - An item has strong or special association with a particular community or cultural group in NSW (or the local area) for social, cultural or spiritual reasons	Local	Local
e - An item has potential to yield information that will contribute to an understanding of NSW's cultural or natural history (or the cultural or natural history of the local area)	State	Local
f - An item possesses uncommon, rare or endangered aspects of NSW's cultural or natural history (or the cultural or natural history of the local area)	State	Nil

Criterion	Mill Site	Singletons Reserve
g - An item is important in demonstrating the principal characteristics of a class of NSW's – cultural or natural places; or – cultural or natural environments. (or a class of the local area's – cultural or natural places; or – cultural or natural environments.)	Local? / Uncertain	Nil

3.3 STATEMENTS OF SIGNIFICANCE

3.3.1 Mill Site

The archaeological remains of the former millrace and associated features of the pre 1820 mill have rarity and potential research significance. Water mills from the first half of the Nineteenth Century are now almost all destroyed and have rarely been recorded. The site complex has the potential to contribute to our understanding of an important industry in the colony of NSW. The site complex also has value at State level for its association with Benjamin Singleton, an important businessman and explorer, and the Singleton family. The site demonstrates aspects of early mill technology and has the potential to add information to several historic themes relating to the adaption of new technologies and early industry. The site also has social value at a local level as it has been the subject of research and interpretation for the local community.

3.3.2 Singletons Reserve

The Reserve is a local feature and displays local aesthetic value with its combination of walking tracks, stone features and creek line. It is important to many local groups and used for walking, bush care, horse riding and other activities. It has some research potential, as yet untested, to inform about local use following the abandonment of the mill, for example the soldier settlement phase of occupation.

4.0 CONSERVATION POLICY

The mill complex has been subject of preliminary recording, however full archival recording has not been undertaken. This would be a first step in management of the site complex. Without a baseline recording it is not possible to effectively monitor change and threats to the site or site elements. The management recommendations and strategies in this section are based on prioritising a detailed site recording.

4.1 RECORDING OF SITE ELEMENTS & ADDITIONAL ASSESSMENT

- The priority for the mill site elements is a detailed recording including surveyed mapping of the identified areas and features. This would enable further management of the site according to the policies and recommendations below.
- Additional assessment of the Aboriginal heritage value of the Reserve in collaboration with Aboriginal stakeholders will be required to adequately understand the cultural values of the area and provide adequate management.

4.2 LEGISLATIVE CONTEXT

The project area is not listed on any heritage schedules, inventories or in any planning instruments. As an archaeological site, the mill remains are protected under the NSW *Heritage Act*. Archaeological features and deposits are afforded statutory protection by the 'relics provision' section 139[1] of the *Act* (as amended in 1999). Under this section it is illegal to disturb or excavate any land knowing or suspecting that the disturbance or excavation will or is likely to result in a relic being discovered, exposed, moved, damaged or destroyed. In such cases, an excavation permit under section 140 is required. No formal listing is required for archaeological relics; they are automatically protected if they are of local significance or higher.

Recommendations relating to listing of the site are discussed further below. A summary of heritage legislation protecting sites in NSW is presented in Appendix 2.

4.3 POTENTIAL THREATS

There are currently no proposed alterations to use of the reserve. The Reserve is used for recreation including: walking, horse riding, bush care and bird watching. Due to the age of the mill remains, there are some potential indirect threats to its condition from continued use.

Vegetation growth

There are a number of saplings currently growing in or close to the millrace wall. As these continue to grow they have the potential to damage the fabric and structure of the wall.

Increased visitation

With visitation there is always the potential for elements, such as cut stone, to be removed by visitors. This does not seem to be a large problem at the moment but the threat could increase over time. Ongoing use of paths by walkers and horse riders has some potential to increase erosion and therefore damage the remaining structures.

Fauna disturbance

The presence of feral or native animals has the potential to disturb elements of the mill site complex. This does not seem to currently be a significant problem.

Natural ageing

As the site ages, without intervention, presumably the structural elements may become weaker and deteriorate. This is a particular issue for the above ground elements such as the millrace.

4.4 POLICY STRATEGY

The following principles relate to the heritage values of the place, its condition and integrity. The actions are formulated within the following strategy framework.

- The mill site complex is of State heritage significance and change that would adversely affect its significance should not occur;
- All reasonable precautions are to be taken to protect the place from damage caused by development, maintenance, use, or other activities;
- Future uses proposed should relate to the cultural significance of the place and the interpretation and public appreciation of that significance;
- Any necessary works on the site elements should be carried out be appropriately qualified and experienced personnel;
- Adverse impacts should only be considered where:
    - it makes possible the salvage, conservation or interpretation of aspects of greater singular or collective significance,
    - it is to ensure the security of the place and its values,
    - there is no feasible alternative to meet legal or health and safety requirements,
    - fabric and elements to be impacted are appropriately recorded,
    - appropriate consultation has occurred and there is agreement from the local community and statutory approvals that may be required have been obtained,
    - all alternatives to minimize impacts have been explored and documented as part of any application for approval,
    - they do not compromise the future research opportunities for the site.
- The maximum amount of significant fabric should be preserved and conserved;
- Conservation works, maintenance and interpretation should be prioritized according to heritage values and risk; and
- All change should be consistent with this CMS.

4.4.1 Listing

It is recommended that Singleton's Reserve be listed on Council's LEP and that an application be made to list the mill site and associated areas of archaeological potential on the State Heritage Register (SHR). This is likely to require additional research as well as liaison with the Heritage Division.

Actions

- Initiate process to have item listed on LEP
- Council should consult with the Heritage Division about listing on SHR

4.4.2 Maintenance

Vegetation control

There are a number of saplings currently growing in or close to the race wall. As these continue to grow they have the potential to damage the fabric and structure of the wall.

Actions

- Council should arrange for an assessment of the structural integrity of the wall and arrange for appropriate removal of trees that are threatening this integrity where this can be done without damage to the structure.

Bush regeneration

There is potential for inadvertent damage to features of the mill site to occur during bush regeneration works.

Action

- It should be ensured that supervisors of any bush regeneration activity are aware of the locations and significance of the elements of the mill site and that any activity within these areas is carefully managed to avoid any damage.

Maintenance strategy & monitoring

In order to understand any threats to the Reserve in general and the mill site in particular it will be necessary to track its condition and any threats over time. Depending on the threats noted other activities may be required to protect the value of the site and Reserve.

Action

- Council should instigate regular monitoring of the reserve and consultation with local interested parties to identify any threats to the values of the site and determine appropriate actions to avoid impact.

4.4.3 Interpretation

The site presents an opportunity to interpret the history of the construction of the mill and how that interacts with adjacent historic sites for the area. Well thought out interpretation can educate and enhance the historic values of the area.

Action

- Council should consider the development of an interpretation strategy to increase public awareness and education about the valuable historic resource within the Reserve.

4.4.4 Review

This document is a preliminary management tool and as such should be reviewed.

Action

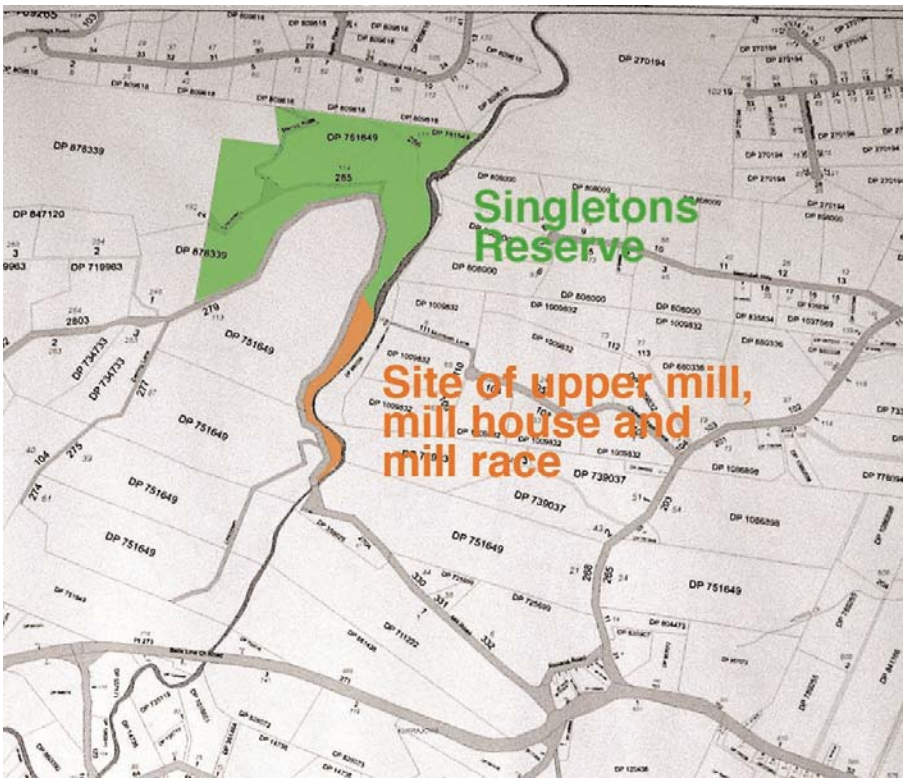
- Review CMS within 2 years.

4.4.5 Future Opportunities

The assessment of the mill site complex for this CMS has thrown up opportunities to increase knowledge about the site and enhance the site's significance. The following suggestions could be used to prioritise future work at the site:

- As mentioned above, a field assessment in collaboration with Aboriginal groups or individuals with a connection to the Reserve would enable a more complete history of the site.
- Non-invasive sub-surface survey techniques such as ground penetrating radar (GPR) could identify additional conservation areas, such as habitation structures, in more detail.
- Additional archival research may provide information to further illuminate the use of the site. This might include the mill period, but also later occupation such as the soldier settlement.
- Further investigation of the 'upper' mill site (currently outside the project area) could provide important information. This area includes the site of the upper mill, mill house and mill race (see Plate 5).Consideration should be given to the incorporation of the second mill site into Singleton's Reserve.

Plate 5: Area likely to contain the upper mill (shaded orange)



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APPENDIX 1: ABORIGINAL SITE TYPES

Site Type	Description
Open Camp Sites/Stone Artefact Scatters/Isolated Finds	Open camp sites represent past Aboriginal subsistence and stone knapping activities, and can include archaeological remains such as stone artefacts and hearths. This site type can be revealed as surface scatters of stone artefacts in areas where vegetation is limited and ground surface visibility increases. Such scatters of artefacts can also be exposed by erosion, land use such as ploughing, and the creation of informal, unsealed vehicle access tracks and walking paths. Sites are often located on dry, relatively flat land along or adjacent to a water source. Sites containing surface or subsurface deposit from repeated or continued occupation are more likely to occur on elevated ground near the most permanent, reliable water sources. Isolated finds may represent a single item discard event, be the result of limited stone knapping activity, or be an artefact that has been displaced from its original location due to erosion or other disturbance. The presence of such isolated artefacts can also indicate the presence of in situ buried archaeological deposit, or additional artefacts obscured by low ground visibility. Isolated artefacts can be located on all landforms associated with past Aboriginal activities. This site type is the most common on the Cumberland Plain.
Scarred or Carved Trees	These sites are trees with scars and/or carved patterns which can be attributed to Aboriginal cultural origin. Tree bark was utilised by Aboriginal people for various purposes, including the construction of shelters (huts), canoes, paddles, shields, baskets and bowls, fishing lines, cloaks, torches and bedding, as well as being beaten into fibre for string bags or ornaments. The removal of bark exposes the heart wood of the tree, resulting in a scar. Trees may also have been scarred in order to gain access to food resources (e.g. cutting toe-holds so as to climb the tree and catch possums or birds), or to mark locations such as tribal territories. Carved trees contain carved patterns on the tree trunk and are often found in association with ceremonial grounds, burials or cultural sites.
Grinding Grooves	Aboriginal grinding grooves are grooves where Aboriginal people have sharpened or manufactured stone axes and other implements and in some cases, ground seed and grains in the sandstone forming 'bowls'. These sites are most often found in sandstone. This site type can occur where suitable geology is present.
Rock Shelter Sites (closed camp sites)	Rock overhangs in areas of sandstone geology can contain evidence of past Aboriginal occupation. This can include stone artefacts, food refuse such as bone or shell if suitably preserved deposits are present. Shelters also can contain pigment art (see below).
Art Sites	Petroglyphs (also referred to as Rock Engravings) are art sites where marks have been made in stone by Aboriginal people (for example, spirit figures, animals, implements and footprints). These sites are most commonly found on flat exposed open areas of sandstone. Art within

Site Type	Description
	rock shelter is usually painted with ochres and pigments on smooth surfaces on the walls of the shelter.
Quarries	Aboriginal quarry sites are sources of raw materials, primarily for the manufacture of stone tools, but also for ochre procurement. They are only found where raw materials (stone or ochre) occur within the landscape, and where these have been exploited in the past. Such sites are often associated with stone artefact scatters and stone knapping areas.
Bora/Ceremonial	Aboriginal ceremonial sites have high cultural value to Aboriginal people. They may comprise natural landforms and, in some cases, will also have archaeological material. Bora grounds are a ceremonial site type, usually consisting of a cleared area around one or more raised earth circles, and often comprised two circles of different sizes, connected by a pathway, and accompanied by ground drawings or mouldings of people, animals or deities, and geometrically carved designs on the surrounding trees. These places are more likely to be found below hills or peaks or above low land subject to inundation.
Natural Mythological (Ritual) sites	These types of sites are usually identified by the local Aboriginal community as locations of cultural significance, and they may not necessarily contain material evidence of Aboriginal associations with the place. These sites are generally determined through community consultation or sometimes via historic recordings.
Middens	Middens are the accumulation of debris from fish, crustaceans and other shell fish (shells, fish bones) consumed as part of Aboriginal people's diet. Middens also often contain charcoal, stone artefacts, bone and other types of material used by Aboriginal people. Middens often occur within close proximity to freshwater and saltwater sources which have potential to contain mussels, oysters and other types of edible bivalves.
Burial	Burials can be found in many different archaeological contexts, including shelter deposits and most often where the ground is soft and sandy. Burials can also be found within middens. They can be associated with carved or scarred trees and ceremonial sites. Burials are difficult to detect unless there are visible eroded evidence of a burial or human remains or they have been identified through historic records, or oral histories.
Contact / Historical Sites	These types of sites are most likely to occur in locations of Aboriginal and settler interaction, such as on the edge of pastoral properties or towns. Artefacts located at such sites may involve the use of introduced materials such as glass or ceramics by Aboriginal people, or be sites of Aboriginal occupation in the historical period. Contact sites are often determined through community consultation.

APPENDIX 2: LEGISLATIVE CONTEXT

National Parks and Wildlife Act 1974 (amended 2010)

The *National Parks and Wildlife Act 1974* (NPW Act) protects Aboriginal objects and Aboriginal places in NSW. It has been amended by the National Parks and Wildlife Regulation 2009 (NPW Regulation). Under the NPW Act, the following are offences unless an exemption or defence is provided for under the Act:

- A person must not knowingly harm or desecrate an Aboriginal object (knowing offence)
- A person must not harm or desecrate an Aboriginal object or Aboriginal place (strict liability offence)

The maximum penalty for the knowing offence is $550,000 or $275,000 (depending on whether there are aggravating circumstances) and 1 or 2 years' goal for an individual. For a corporation the maximum penalty for the knowing offence is $1.1 million. The maximum penalty for the strict liability offence is $110,000 or $55,000 (depending whether there are aggravating circumstances) for an individual or $220,000 for a corporation.

Harm includes acts or omissions that "destroy, deface or damage" an Aboriginal object or Aboriginal Place, and in relation to an object, move the object from the land on which it has been situated. Harm does not include something that is trivial or negligible.

Section 91 of the Act also obliges any person who discovers an Aboriginal object to report it to the OEH for it to be entered on the AHIMS.

An Aboriginal object is defined as:

"…any deposit, object or material evidence (not being a handicraft made for sale) relating to the Aboriginal habitation of the area that comprises New South Wales, being habitation before or concurrent with (or both) the occupation of that area by persons of non-Aboriginal extraction, and includes Aboriginal remains."

An Aboriginal object is legally protected irrespective of land tenure, the significance of the object and whether or not it has been recorded.

"Aboriginal Places" are places so declared under Section 84 of the Act.

Anyone who exercises due diligence in determining that their actions will not harm Aboriginal objects has a defence against prosecution for the strict liability offence if they later harm an object. Due diligence can be exercised by complying with the *Due Diligence Code of Practice for the Protection of Aboriginal Objects in NSW* (DECCW 2010c)(or industry-specific codes of practice) that has been adopted under the National Parks and Wildlife Regulation 2009. The code provides a process to enable a reasonable determination of whether or not Aboriginal objects will be harmed by an activity or whether further investigation or an Aboriginal Heritage Impact Permit (AHIP) are required.

There is also a range of defined exemptions and low impact activities defined in the Regulation for which due diligence is not required. These include undertaking specified farming, land management, maintenance, surveying or environmental rehabilitation works.

Clause 80B Defence of carrying out certain low impact activities: section 87 (4)

(1) It is a defence to a prosecution for an offence under section 86 (2) of the Act, if the defendant establishes that the act or omission concerned:

(a) was maintenance work of the following kind on land that has been disturbed:

(i) maintenance of existing roads, fire and other trails and tracks,

Under the amended Act a permit will no longer be required to *look for* Aboriginal objects providing the investigation is undertaken in accordance with the *Code of Practice for Archaeological Investigation of Aboriginal Objects in NSW* (DECCW 2010b). Archaeological test excavations that follow the code do not require an AHIP. If objects are present and harm cannot be avoided it is necessary to apply for an AHIP.

There are also requirements for consultation with Aboriginal people relating to AHIP applications. These are set out in the *Aboriginal cultural heritage consultation requirements for proponents 2010* (DECCW 2010a).

Environmental Planning and Assessment Act 1979

The *EP&A Act* requires that environmental impacts are considered in land use planning and decision-making. The definition of 'environmental impacts' includes impacts on the cultural heritage of the project area. The Act sets out specific statutory assessment processes including:

- Part 4: Development that requires consent under consideration of environmental planning instruments.

- Part 5: An assessment process for activities undertaken by public authorities and for developments that do not require development consent but an approval under another mechanism.

Heritage Act 1977

Heritage Act 1977

The *Heritage Act 1977* (NSW) is a statutory tool designed to conserve the environmental heritage of NSW and is used to regulate development impacts on the state's heritage places, buildings, works, relics, moveable objects or precincts that are important to the people of NSW. These include items of Aboriginal and non-Aboriginal heritage significance. Where these items have particular importance to the state of NSW, they are listed on the State Heritage Register (SHR).

Identified heritage items may be protected by means of either Interim Heritage Orders (IHO) or by listing on the State Heritage Register (SHR). Proposals to alter, damage, move or destroy places, buildings, works, relics; moveable objects or precincts protected by an IHO or listed on the SHR require an approval under section 60.

Archaeological features and deposits are afforded statutory protection by the 'relics provision' section 139[1] of the Act (as amended in 1999). Under this section it is illegal to disturb or excavate any land knowing or suspecting that the disturbance or excavation will or is likely to result in a relic being discovered, exposed, moved, damaged or destroyed. In such cases, an excavation permit under section 140 is required. Note that no formal listing is required for archaeological relics; they are automatically protected if they are of local significance or higher.

Heritage registers

The Heritage Branch of OEH maintains registers of heritage sites that are of State or local significance to NSW. The NSW State Heritage Register (SHR) is the statutory register under Part 3A of the *Heritage Act 1977* (NSW). The State Heritage Inventory (SHI) is an amalgamated register of items on the SHR, items listed on LEPs and/or on a State Government Agency's Section 170 register and may include items that have been identified as having state or local level significance, but which are statutorily protected at a local level. If a particular site does not appear on either the SHR or SHI this does not mean that the site does not have heritage significance as many sites within NSW have not been assessed to determine their heritage significance. Sites that appear on either the SHR or SHI have a defined level of statutory protection.

Key Aboriginal sites, including post contact sites, can be protected by inclusion on the SHR. The Heritage Council nominates sites for consideration by the Minister for Environment and Heritage.

Hawkesbury Local Environmental Plan 2012

The study area falls within the land covered under the Hawkesbury Local Environmental Plan (LEP). Conservation of Heritage is addressed within Part 5.10 of the LEP and includes the following:

Heritage items (if any) are listed and described in Schedule 5. Heritage conservation areas (if any) are shown on the Heritage Map as well as being described in Schedule 5.

(1) **Objectives** The objectives of this clause are as follows:

(a) to conserve the environmental heritage of Hawkesbury,

(b) to conserve the heritage significance of heritage items and heritage conservation areas, including associated fabric, settings and views,

(c) to conserve archaeological sites,

(d) to conserve Aboriginal objects and Aboriginal places of heritage significance.

(2) **Requirement for consent** Development consent is required for any of the following:

(a) demolishing or moving any of the following or altering the exterior of any of the following (including, in the case of a building, making changes to its detail, fabric, finish or appearance):

(i) a heritage item,

(ii) an Aboriginal object,

(iii) a building, work, relic or tree within a heritage conservation area,

(b) altering a heritage item that is a building by making structural changes to its interior or by making changes to anything inside the item that is specified in Schedule 5 in relation to the item,

(c) disturbing or excavating an archaeological site while knowing, or having reasonable cause to suspect, that the disturbance or excavation will or is likely to result in a relic being discovered, exposed, moved, damaged or destroyed,

(d) disturbing or excavating an Aboriginal place of heritage significance,

(e) erecting a building on land:

(i) on which a heritage item is located or that is within a heritage conservation area, or

(ii) on which an Aboriginal object is located or that is within an Aboriginal place of heritage significance,

(f) subdividing land:

(i) on which a heritage item is located or that is within a heritage conservation area, or

(ii) on which an Aboriginal object is located or that is within an Aboriginal place of heritage significance.

(3) **When consent not required** However, development consent under this clause is not required if:

(a) the applicant has notified the consent authority of the proposed development and the consent authority has advised the applicant in writing before any work is carried out that it is satisfied that the proposed development:

(i) is of a minor nature or is for the maintenance of the heritage item, Aboriginal object, Aboriginal place of heritage significance or archaeological site or a building, work, relic, tree or place within the heritage conservation area, and

(ii) would not adversely affect the heritage significance of the heritage item, Aboriginal object, Aboriginal place, archaeological site or heritage conservation area, or

(b) the development is in a cemetery or burial ground and the proposed development:

(i) is the creation of a new grave or monument, or excavation or disturbance of land for the purpose of conserving or repairing monuments or grave markers, and

(ii) would not cause disturbance to human remains, relics, Aboriginal objects in the form of grave goods, or to an Aboriginal place of heritage significance, or

(c) the development is limited to the removal of a tree or other vegetation that the Council is satisfied is a risk to human life or property, or

(d) the development is exempt development.

(4) **Effect of proposed development on heritage significance** The consent authority must, before granting consent under this clause in respect of a heritage item or heritage conservation area, consider the effect of the proposed development on the heritage significance of the item or area concerned. This subclause applies regardless of whether a heritage management document is prepared under subclause (5) or a heritage conservation management plan is submitted under subclause (6).

(5) **Heritage assessment** The consent authority may, before granting consent to any development:

(a) on land on which a heritage item is located, or

(b) on land that is within a heritage conservation area, or

(c) on land that is within the vicinity of land referred to in paragraph (a) or (b),

require a heritage management document to be prepared that assesses the extent to which the carrying out of the proposed development would affect the heritage significance of the heritage item or heritage conservation area concerned.

(6) **Heritage conservation management plans** The consent authority may require, after considering the heritage significance of a heritage item and the extent of change proposed to it, the submission of a heritage conservation management plan before granting consent under this clause.

(7) **Archaeological sites** The consent authority must, before granting consent under this clause to the carrying out of development on an archaeological site (other than land listed on the State Heritage Register or to which an interim heritage order under the *Heritage Act 1977* applies):

(a) notify the Heritage Council of its intention to grant consent, and

(b) take into consideration any response received from the Heritage Council within 28 days after the notice is sent.

(8) **Aboriginal places of heritage significance** The consent authority must, before granting consent under this clause to the carrying out of development in an Aboriginal place of heritage significance:

(a) consider the effect of the proposed development on the heritage significance of the place and any Aboriginal object known or reasonably likely to be located at the place by means of an adequate investigation and assessment (which may involve consideration of a heritage impact statement), and

(b) notify the local Aboriginal communities, in writing or in such other manner as may be appropriate, about the application and take into consideration any response received within 28 days after the notice is sent.

(9) **Demolition of nominated State heritage items** The consent authority must, before granting consent under this clause for the demolition of a nominated State heritage item:

(a) notify the Heritage Council about the application, and

(b) take into consideration any response received from the Heritage Council within 28 days after the notice is sent.

(10) **Conservation incentives** The consent authority may grant consent to development for any purpose of a building that is a heritage item or of the land on which such a building is erected, or for any purpose on an Aboriginal place of heritage significance, even though development for that purpose would otherwise not be allowed by this Plan, if the consent authority is satisfied that:

(a) the conservation of the heritage item or Aboriginal place of heritage significance is facilitated by the granting of consent, and

(b) the proposed development is in accordance with a heritage management document that has been approved by the consent authority, and

(c) the consent to the proposed development would require that all necessary conservation work identified in the heritage management document is carried out, and

(d) the proposed development would not adversely affect the heritage significance of the heritage item, including its setting, or the heritage significance of the Aboriginal place of heritage significance, and

(e) the proposed development would not have any significant adverse effect on the amenity of the surrounding area.

APPENDIX 3: SITE RECORDINGS - 2009 FIELDWORK

Little Wheeny Creek Mill Site

Kurrajong, Lower Blue Mountains, New South Wales

Preliminary Site Report for fieldwork undertaken in October, 2009

Edited By: Adele Anderson and Nicky Corbett

University of Sydney

2010

Contents:

Little Wheeny Creek Mill, Kurrajong, NSW: Preliminary Site Report, 2010

Adele Anderson and Nicky Corbett (eds.)

1. Introduction to the Report

This report presents the results of recording at the site of a nineteenth century mill at Kurrajong, NSW. Recording was undertaken on behalf of the Kurrajong-Comleroy Historical Society by students of the University of Sydney, under the supervision of Dr. Martin Gibbs, in October 2009.

Due to time constraints and the limited experience of many of the students involved, only basic recording was carried out, however this report does provide an indication of the nature of the site and the material remains present.

Contributions:

- The Kurrajong-Comleroy Historical Society (KCHS) brought the site to the attention of Dr. Gibbs, provided information about its history, arranged access to it, and assisted with recording.
- Dr. Martin Gibbs – fieldwork organisation and management
- Student volunteers – worked in the following teams to record each part of the site:

Dam
Peter Howard
Jaki Baloh

Mill Race
Elizabeth Pleskun
Rebecca Moore
Lucy Patterson
Sarah Hellyer

Lower Mill
Karen Stokes
Sally MacLennan

Possible Settlement
Nick Pitt
Nicky Corbett
Adele Anderson

2. Site Location and Description

The site is located in Kurrajong, New South Wales, on Hawkesbury Council Reserve Land. It consists of five related study areas: the Dam, Mill Race, Lower Mill, Upper Mill, and Possible Settlement (see Figure 1). All are situated on the east bank of Little Wheeny Creek, though only the Upper Mill, Dam and Mill Race are still clearly visible.

A modern path runs along the north of the site from Mill Road to the creek, and immediately north of this path is an area of sloping land that was probably used by the local council to dump rubbish until the 1970s (Personal Communication, KCHS member, October 2009). This idea is supported by numerous surface artefacts, including mould-formed glass bottles and half-buried fragments of intact fabric.

Native vegetation covers the site, along with many introduced plant species (particularly in the locale of the rubbish dump). The ground slopes down toward the creek, in some places very steeply.

Occasional surface scatters of artefacts are visible across the site, including ceramic and glass fragments, glass bottles and bricks, though in some cases these may be related to the recent rubbish dump.

The following report will provide more detailed descriptions, plans, and transects of each study area.

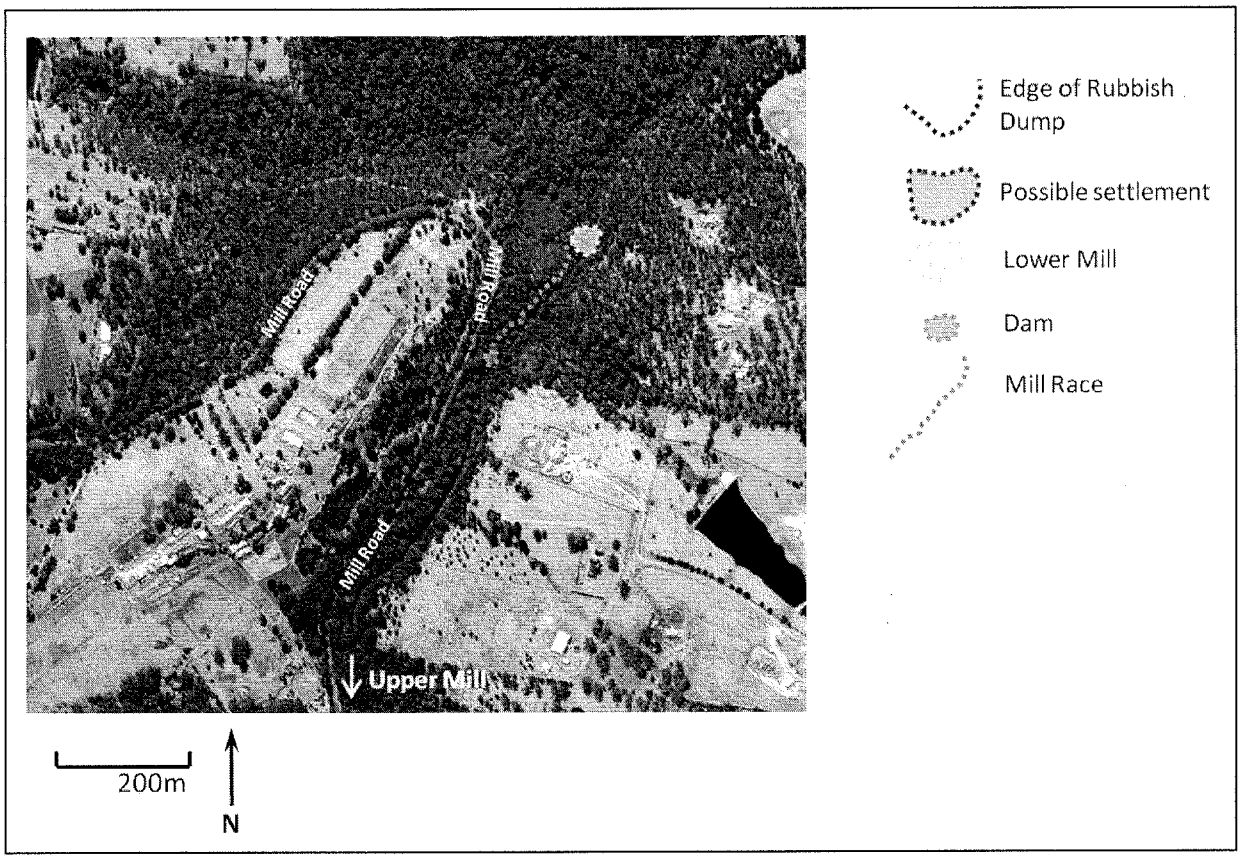


Figure 1. The approximate position of each study area (aerial photo courtesy of Nearmap.com)

3. Historical Background

No independent archival research was undertaken in writing this report. The following information consists of extracts from correspondence with the Kurrajong-Comleroy Historical Society (KCHS):

> "William Singleton was transported to Australia; his family with him. William was granted land near present day Wilberforce and two of his sons, Benjamin and James, were granted land (50 acres each) in 1809 in the district of Richmond Hill. This land was near present day Grose Vale but the brothers did not continue with those grants. We believe both brothers had worked in water driven mills in England and [had] knowledge of their construction. Somewhere between 1810 and 1816 the first Mill [the Upper Mill] was constructed on Little Wheeny Creek, this was an undershot Mill and was run by Benjamin Singleton and his family. At the same time or a little later James Singleton constructed and ran the bottom Mill, this was an overshot Mill. These Mills were connected to the Government Stores at Wilberforce and Green Hills by the 'Grain Road' now known as Kurmond Road. Grain and flour were transported by bullock teams. The Mills were later sold to various people with the name Leverton Mills appearing on early maps.
>
> Benjamin Singleton was ambitious and sought to better his position by moving into cattle production and sought better pasture. As early as 1816 he was searching towards the north – his route is noted on a map used by Parr. Benjamin joined Parr's unsuccessful expedition and later was a member of John Howe's successful expedition that made it through to Patrick's Plains and the Hunter River. By 1823 Benjamin moved his family north and took up a grant which in time became the town site we now know as Singleton. James stayed with the milling business and constructed a tidal mill on the Hawkesbury River as well as significant stone works."
>
> (Frank Holland, KCHS 2009: Miscellaneous Correspondence)

> "...an 'Inn' was erected nearby known as the 'Donnybrook' and although nothing is visible of this building local people remember its location and some recall walking on the remains of a stone verandah (stones since removed we think). Some years ago two Mill Stones were recovered not far from location of that Inn. We also believe that a number of smaller dwellings were close by the Mills... To our knowledge the site has remained undisturbed apart from local people taking away worked stone that probably formed some of the foundations of the Mills (some are said to still exist in building near the site)."
>
> (Frank and Valerie Holland, KCHS 2009: Email to Dr. Martin Gibbs, Sent – Fri 6/19/2009 3:16 PM, Subject – *Kurrajong-Comleroy Historical Society Inc (KCHS), possible dig site*)

4. Study Areas

4.1 – Dam

The Dam Area consists of a sloping open space on the west bank of Little Wheeny Creek, bound on its west side by boulders which appear to have been deliberately squared. Within the proposed dam area exists the remains of a stone wall, similar in construction to the retaining walls along the east side of the Mill Race. These elements can be seen on the baseline-offset plan shown in Figure 2 . A transect was taken across the Dam area, and its location marked on the mud map in Figure 3. The slope of the area and potential depth of the dam can be seen on the transect diagram (see Figure 4). Any traces of a dam weir are no longer extant, potentially being washed downstream once maintenance ceased on the mill and its infrastructure.

Though the beginning of the mill race is now unclear, it is highly likely that it began at the dam, meaning the two features are closely associated.

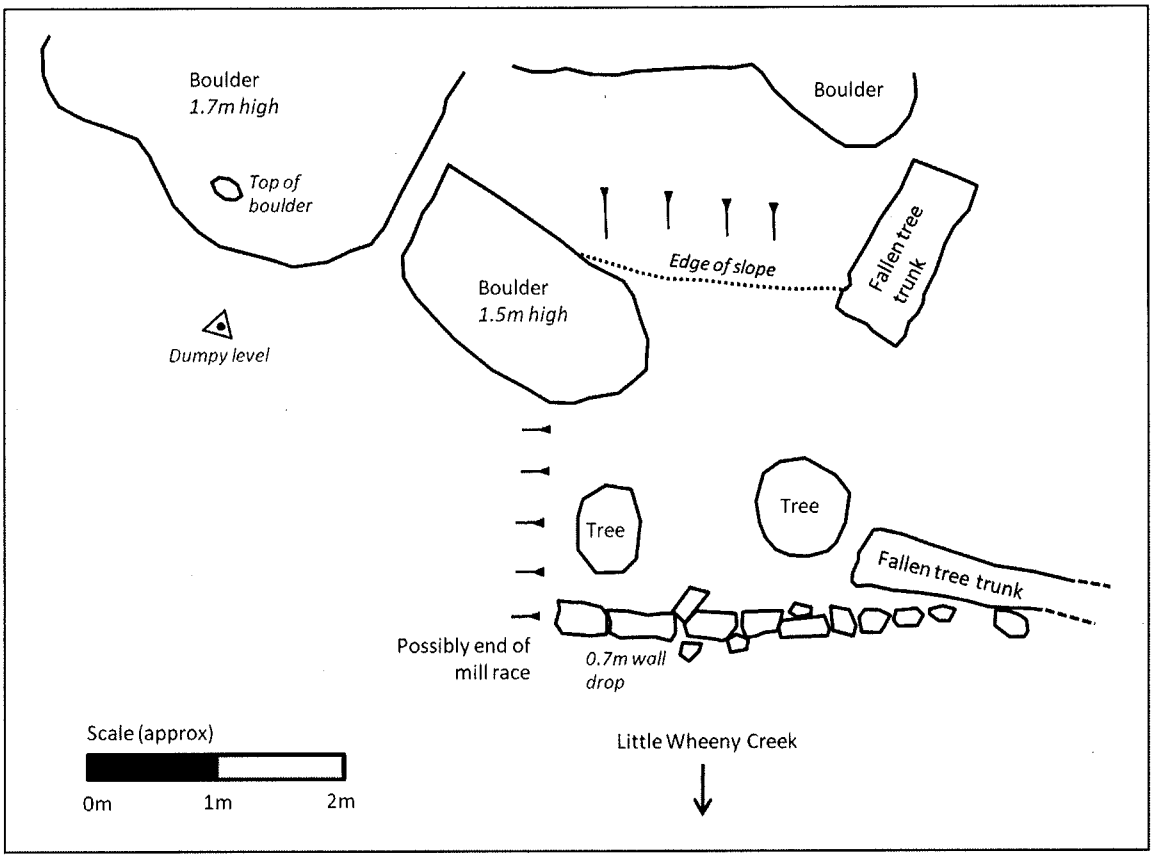


Figure 2. Plan of the Dam Area (10/10/09)

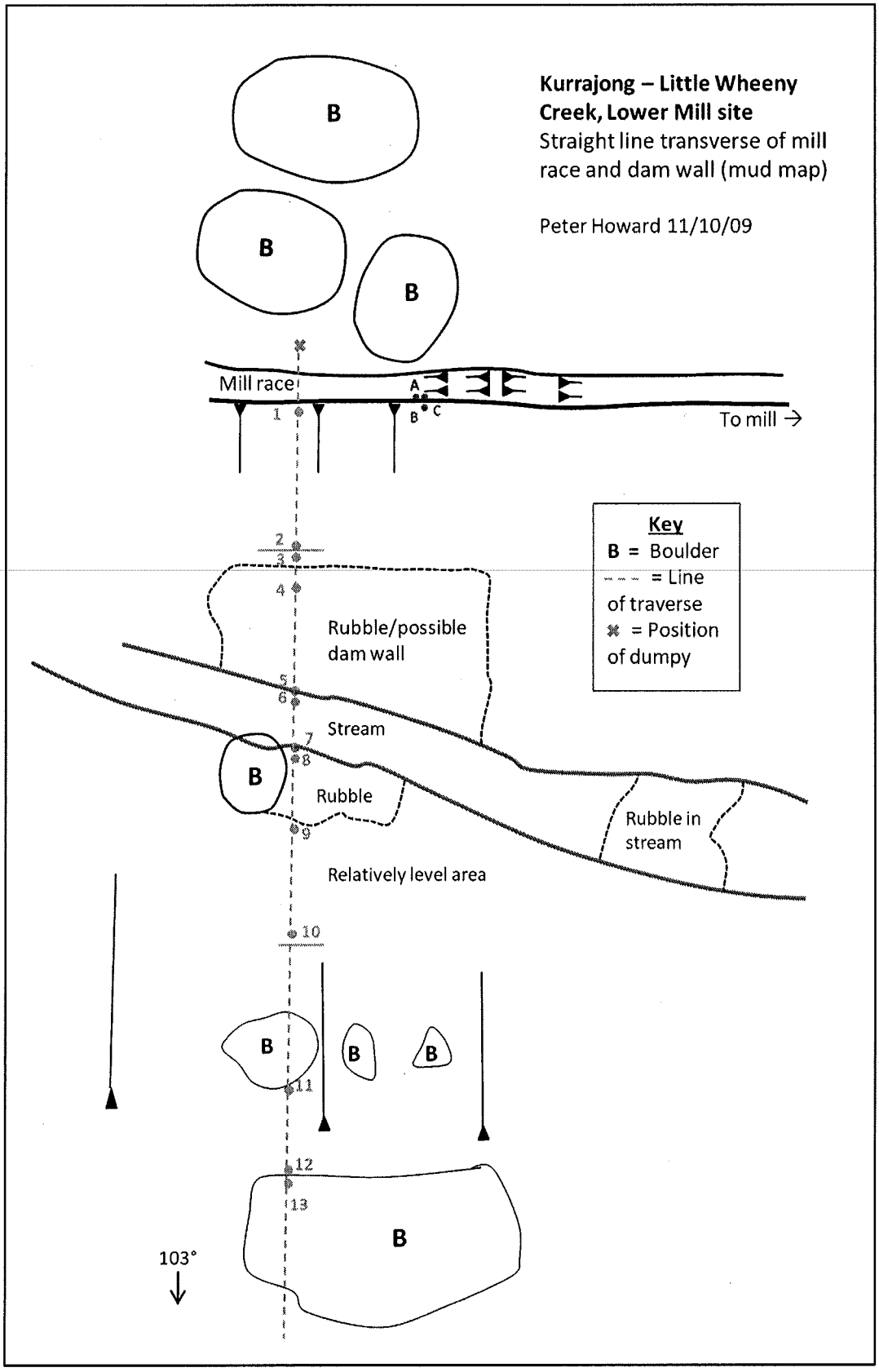


Figure 3. Mud map of the Dam Area showing the position of the transect taken

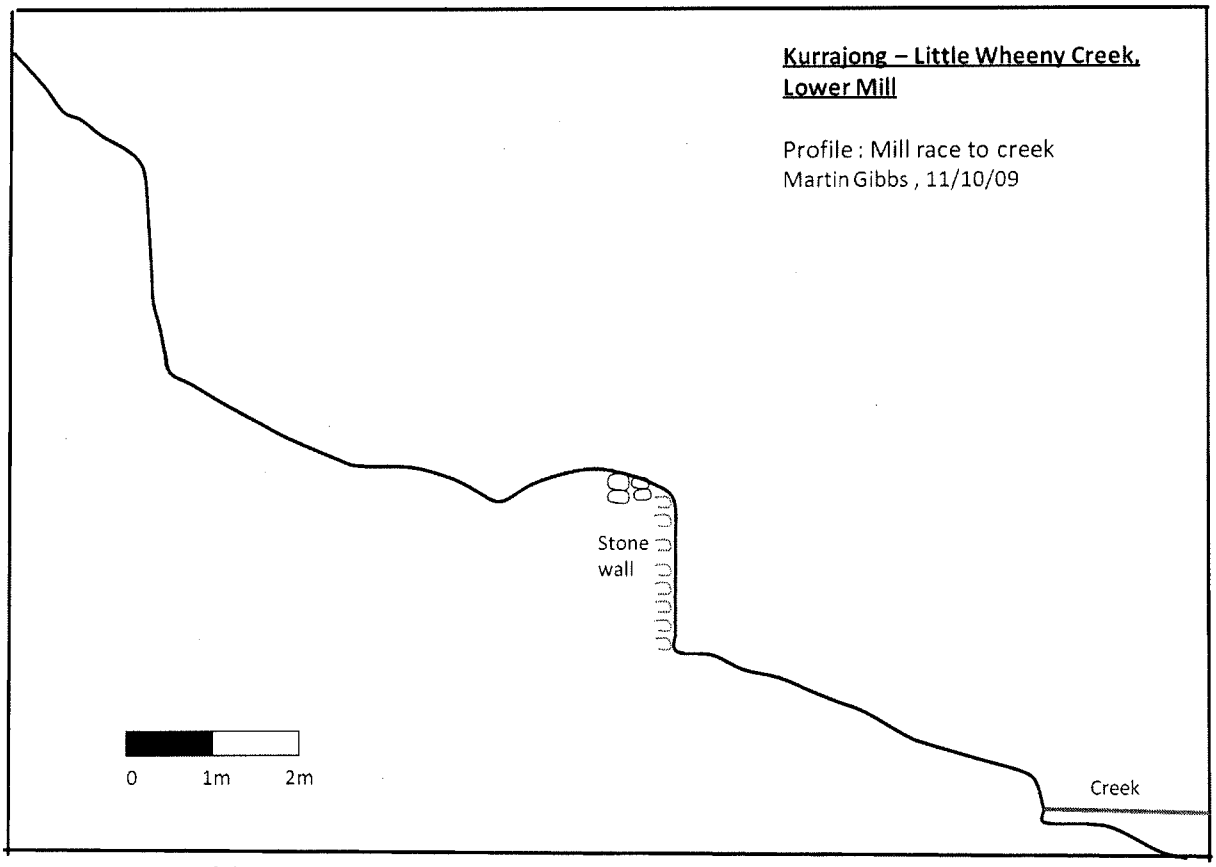


Figure 4. Transect of the Dam Area

4.2 – Mill Race

The Mill Race is approximately 200 meters long and consists of a channel dug into the side of a natural hill at varying elevation. The exact beginning and termination of the channel is now unclear, although it most likely started at the Dam and followed a downward slope to the Lower Mill, with its original function being to move water from the Dam to the Mill. As a feature of the overall site it is therefore directly associated with both the Dam and Lower Mill study areas.

The channel formed a mill race, originally constructed of hand built stone retaining walls and potentially lined with timber planks. No traces of planks remain. The stone retaining walls have eroded in some places, though several good stonework examples still remain on the western side of the channel (Figure 5). The race is elevated above the level of the creek along its entire length (see Figures 8-13). The race cuts through several large stone boulders that were possibly modified to accommodate the path of the race.

Figure 5. Mill race, retaining wall along west side (courtesy of KCHS)

The present surface of the mill race consists of compacted sediment that makes understanding the original depth of the race difficult without excavation. Vegetation impinges throughout, which inhibited accurate measurement (Figure 6).

Figure 6. Looking north along the mill race (10/10/09)

Figure 7. Plan of the mill race

A series of transects were taken along the race at the 10m, 50m, 70m, 100m, 150m and 198m marks. The selection of transect distances was arbitrary, with a transect taken every 50 metres and an additional transect at the 70m mark, where a significant change in elevation warranted recording. Photographs were also taken along the mill race, with their locations recorded.

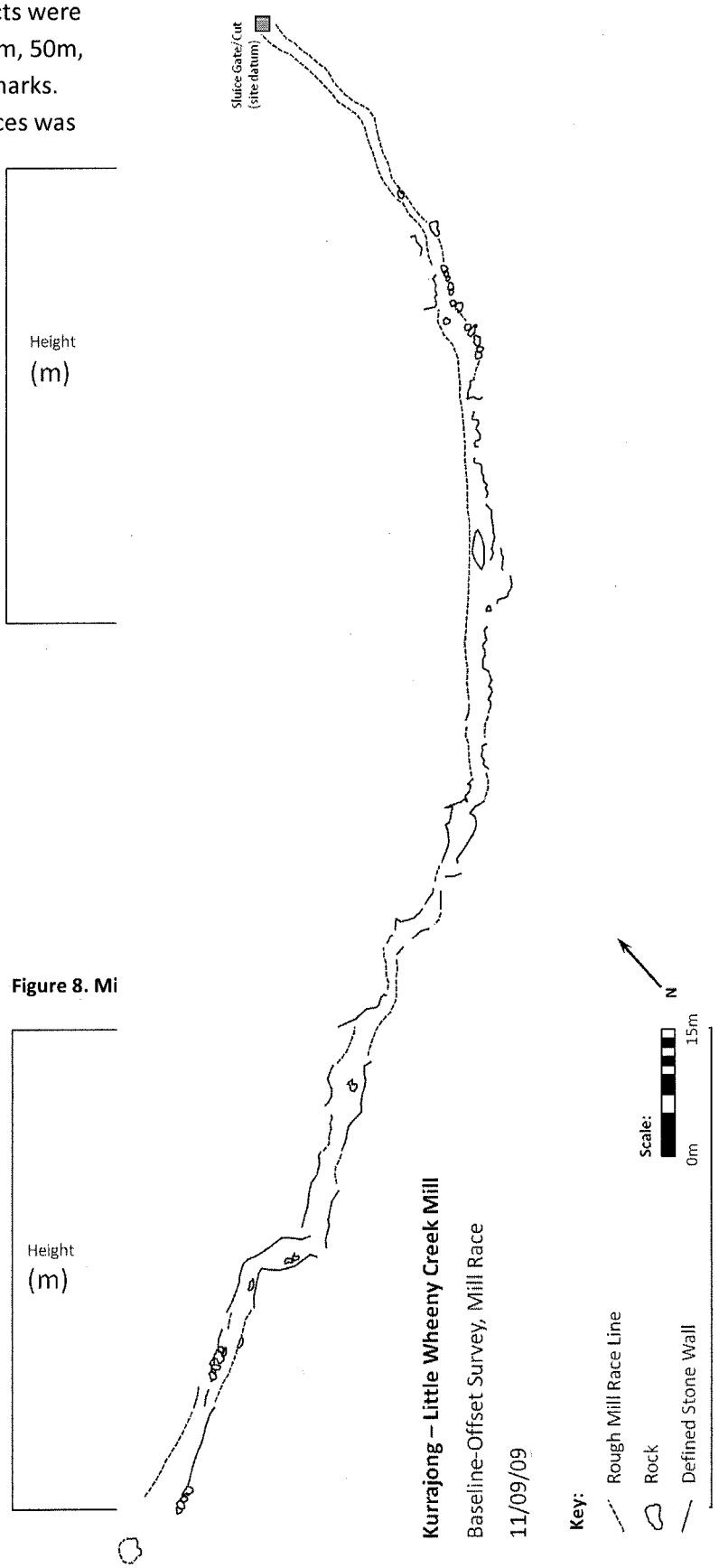
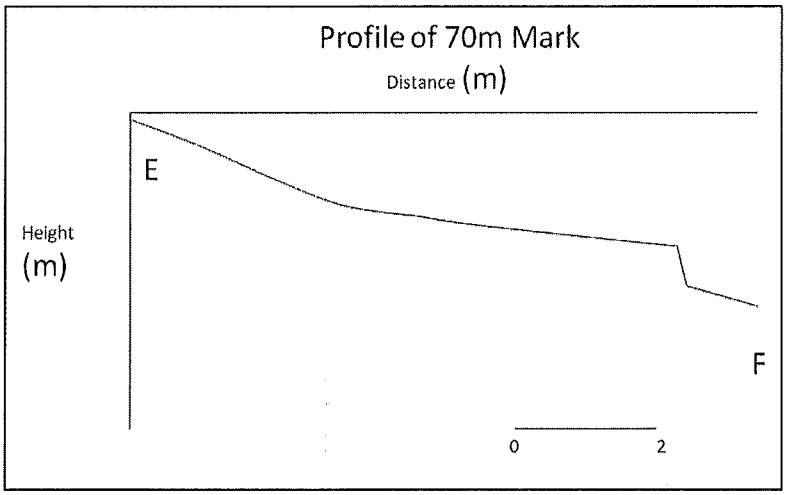


Figure 8. Mi

Height (m)

Figure 9. Mill race transect, 50m



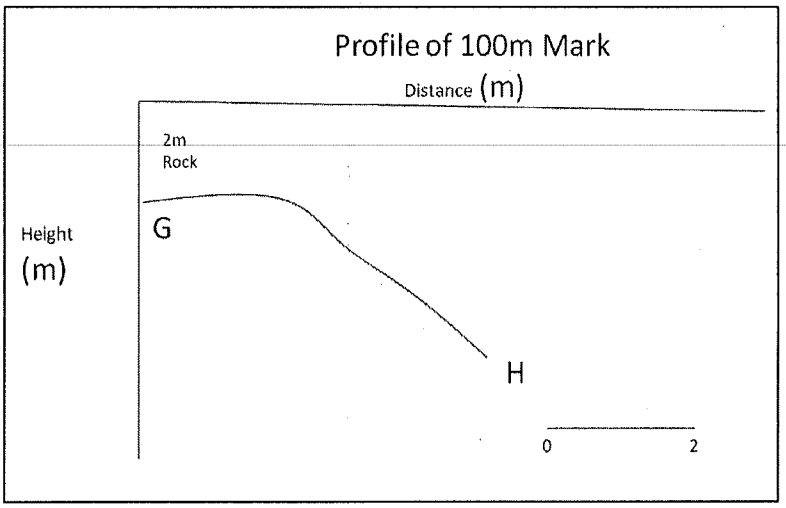
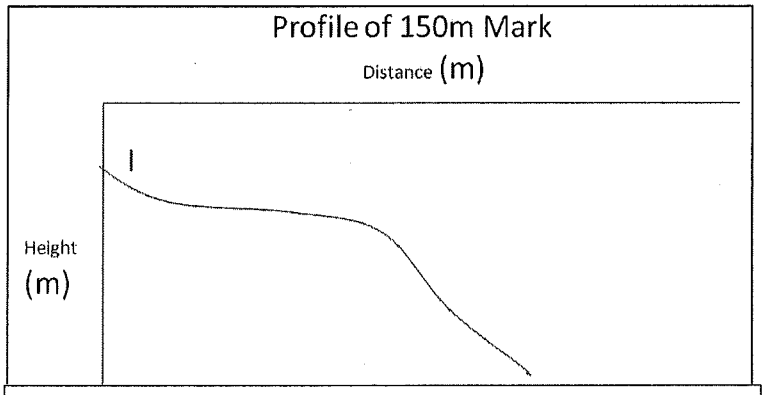


Figure11. Mill race transect, 100m



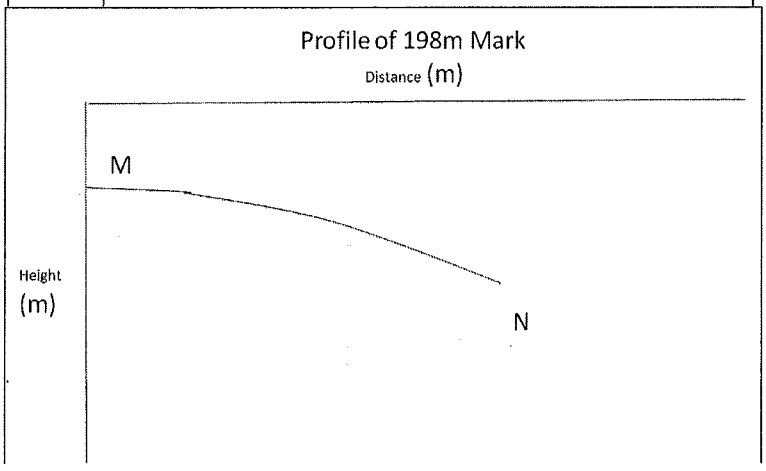
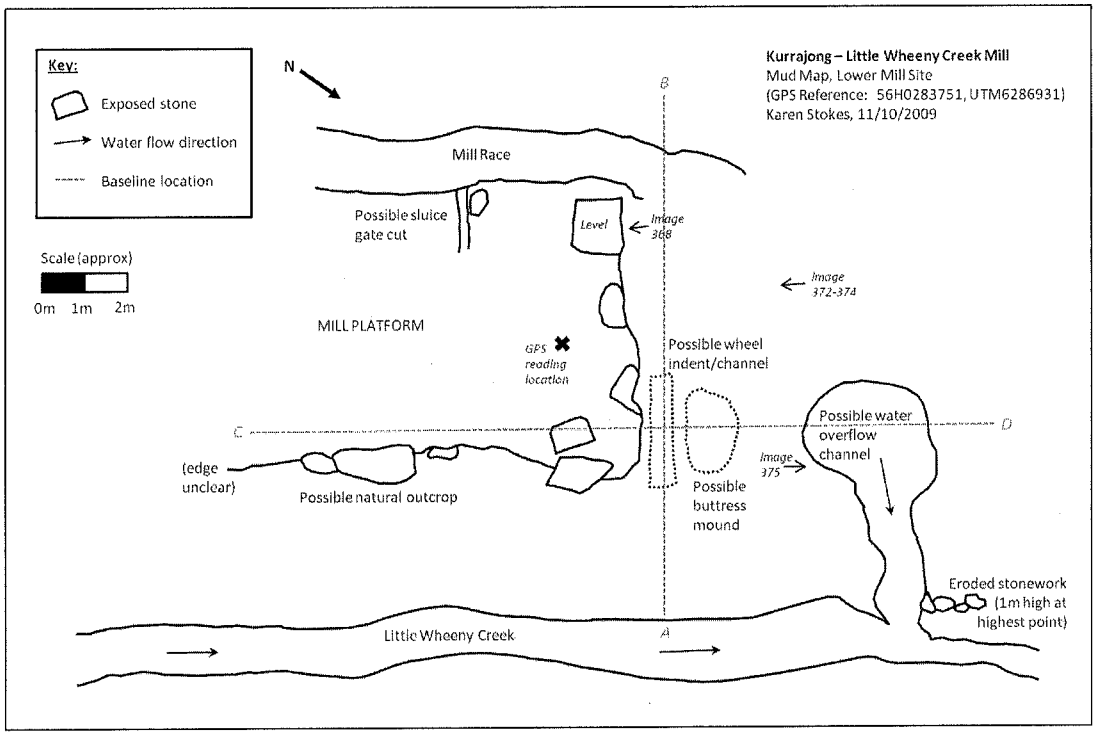


Figure 13. Mill race transect, 198m

4.3 – Lower Mill

The area believed to be the Lower Mill is situated on the east bank of Little Wheeny Creek on sloping ground that consists of alluvial soil and prominent sandstone outcrops. The Lower Mill is made up of two sections of built stonework and a number of mounds, dips and gullies that may be artificial. One section of stonework is positioned at the base of the slope, close to the creek. The other is further up the slope and consists of two large, flat pieces of sandstone which possibly define the two corners of a structure. The earth behind these stones forms a relatively flat 'terrace'. Immediately beside this possible structure (to the northwest) is a slight depression, followed by a dirt mound and then a large erosion gully which leads directly into the creek. It is possible that this gully originally functioned as an outflow channel, returning the water used in the mill to Little Wheeny Creek.



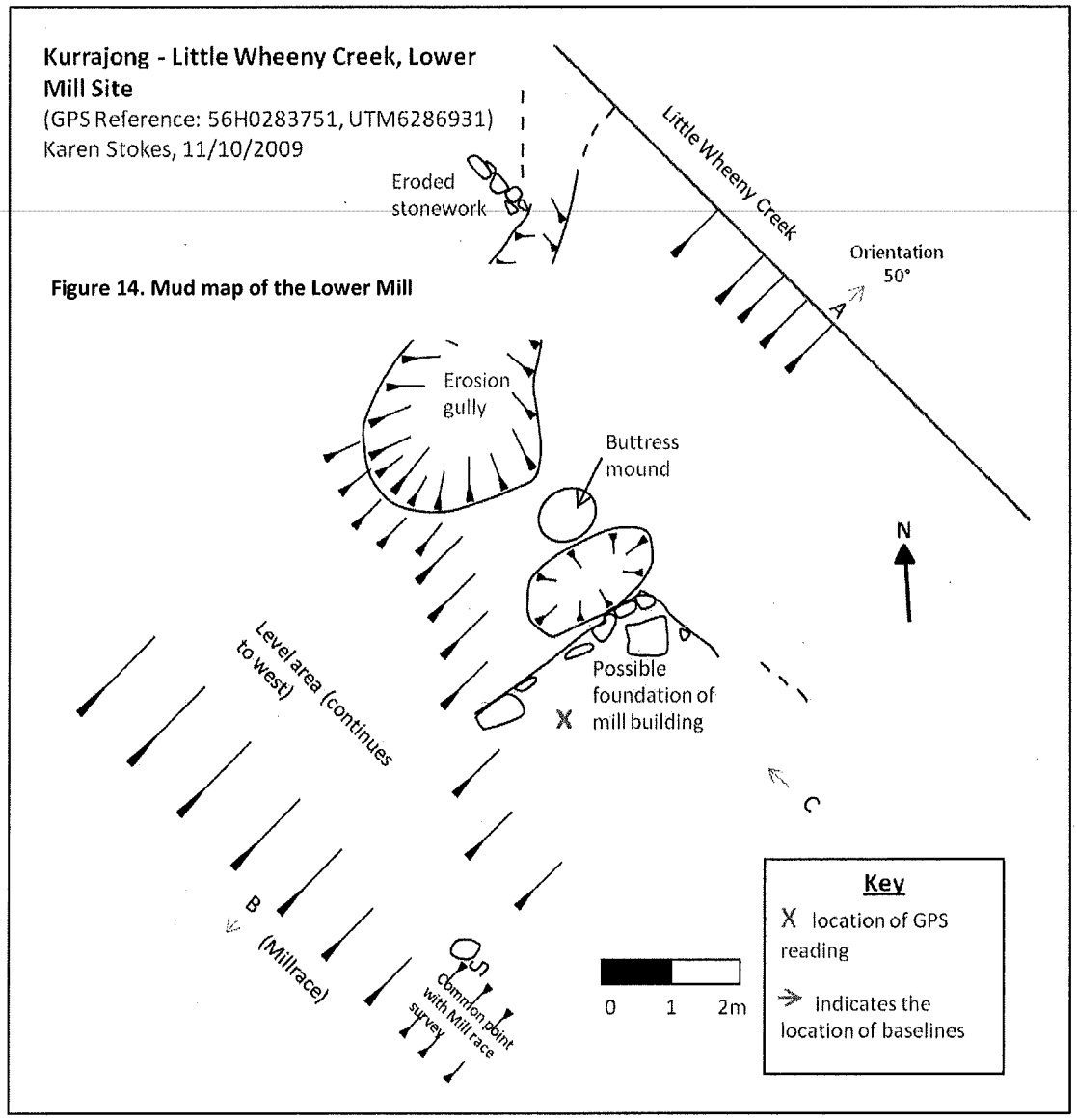


Figure 14. Mud map of the Lower Mill

Figure15.. Plan of the Lower Mill

Soil erosion has had a significant impact on the preservation of the area, causing features to move down the slope and possibly removing any lighter material remains from the surface. Encroaching vegetation acted to restrict visibility and access, hindering a thorough understanding of the Lower Mill.

The area was recorded using a baseline-offset plan, with two profiles taken – one (B-A) measuring the downward slope, and the other (D-C) cutting across the 'terrace' and the erosion gully (see Figures 16-17). Photographs were taken and marked on a mud map (Figure 14).

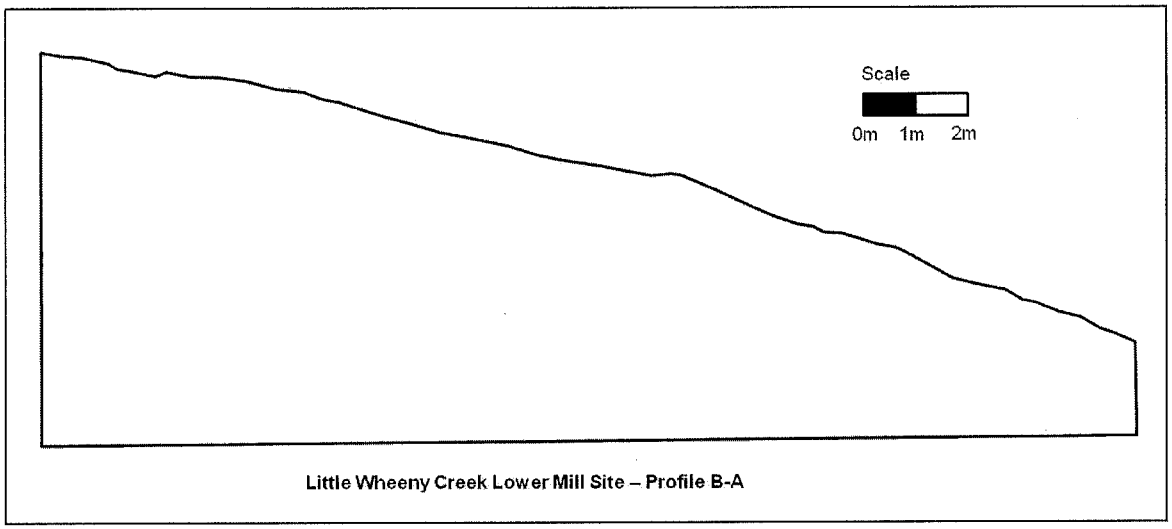


Figure16.. Lower Mill transect, B-A

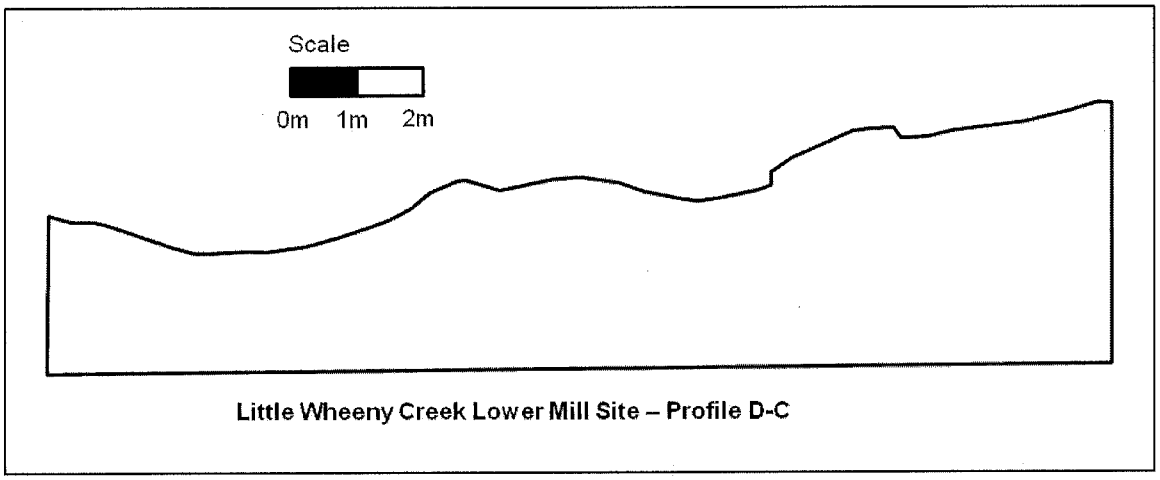
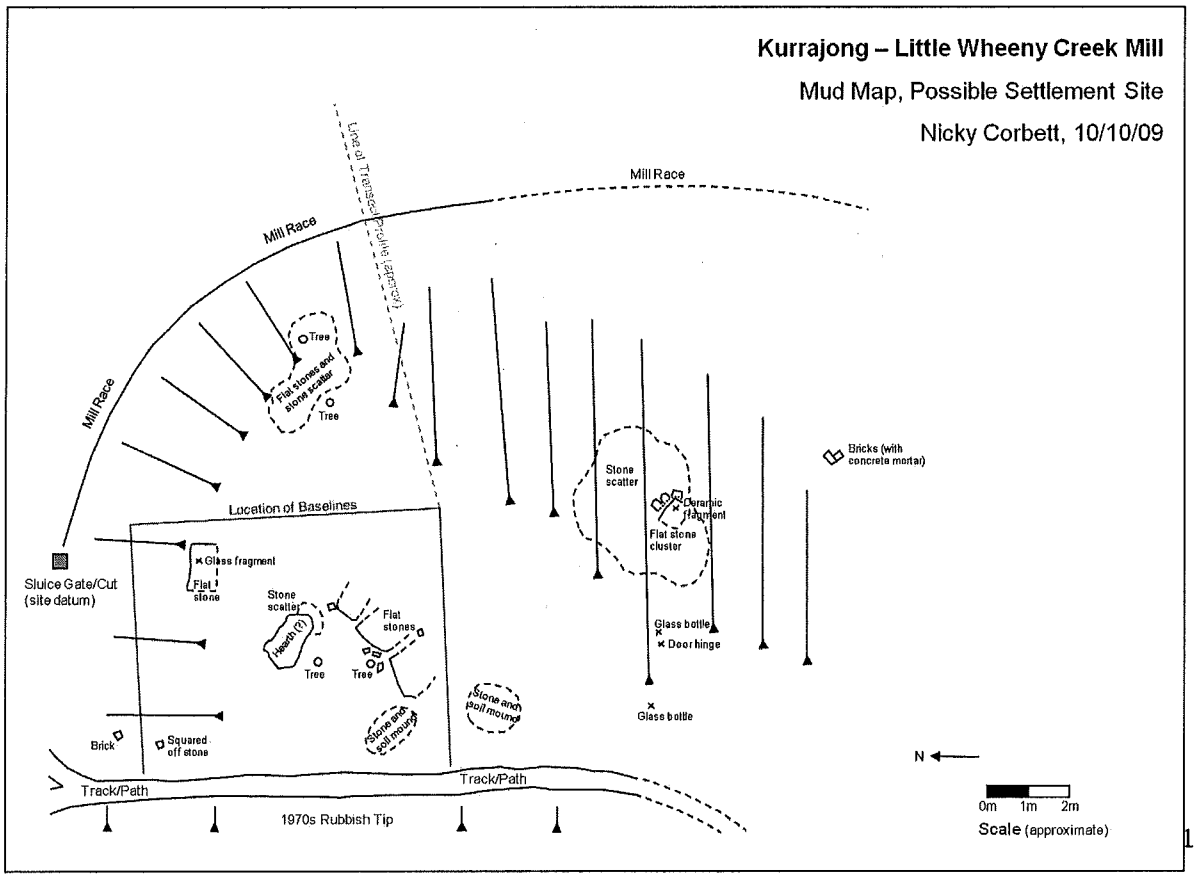


Figure 17. Lower Mill transect, D-C

4.4 – Possible Settlement

This area is identified by the Kurrajong - Comleroy Historical Society as a possible settlement associated with the mill. It is bounded by the modern path on the west and the mill race to the north and east (see Figure 18). Overall, there is a fairly significant slope downwards to the north and east of this area, leading down towards the mill race. On the opposite side of the modern path, west of the Possible Settlement, the land slopes upwards, although not as steeply as near the mill race. This area was identified as a rubbish dump by KCHS (personal communication, KCHS member, October 2009). The Possible Settlement includes a large flattened area, corresponding to the area surveyed by base-line offset (see Figure 18 –roughly a 9x12 m area) and continuing for at least another 10 metres south of this. There are several exposed rock platforms situated across the area, as well as some scattered stones.



A number of soil and stone mounds are located near each other and close to some flat pieces of sandstone. Together these form the feature recorded in Figure 19. It is possible that this feature was once a structure, but this cannot be confirmed without more invasive investigation. It is equally possible that it is a natural stone outcrop disturbed by the action of nearby trees.

Figure18. Mud map of the Possible Settlement

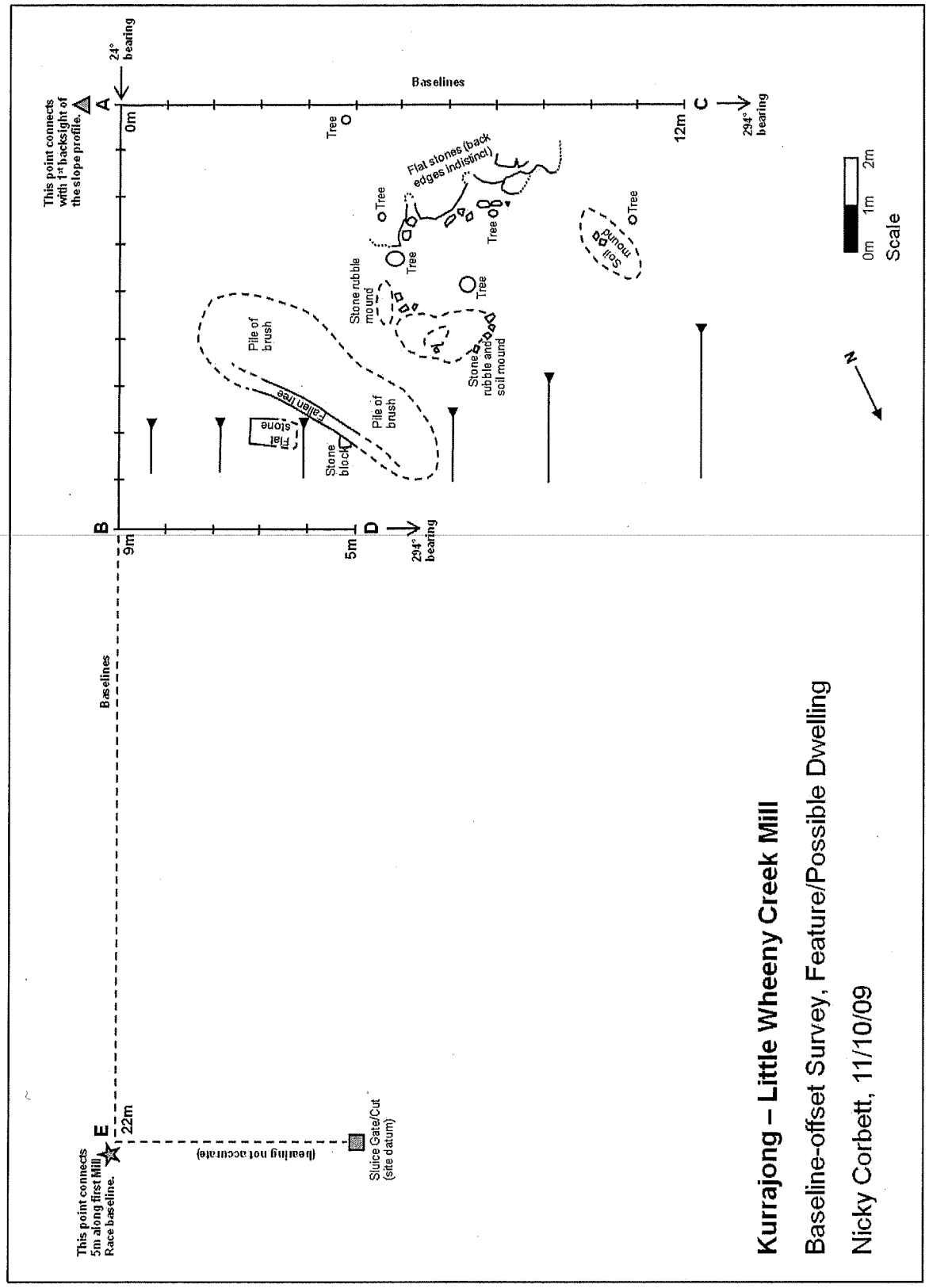


Figure 19. Plan of possible structure

Across the area are also several artefacts, including fragments of glass and ceramic, and glass bottles. The is also some scattered building material, including a coarse brick on the northern end of the site and bricks with cement mortar at the southern end (see Figure 18). While these artefacts may be associated with the potential dwelling or settlement, it is quite possible that they have simply moved downhill from the rubbish dump to the west of the site.

Recording of this area was constrained by thick vegetation which impeded both visibility and access. Because of these problems and the large size of the area, a basic mud map was used to record the Possible Settlement in its entirety, with only the potential structure recorded in detail using a baseline-offset. A transect was taken from the settlement to the mill race (Figure 20).

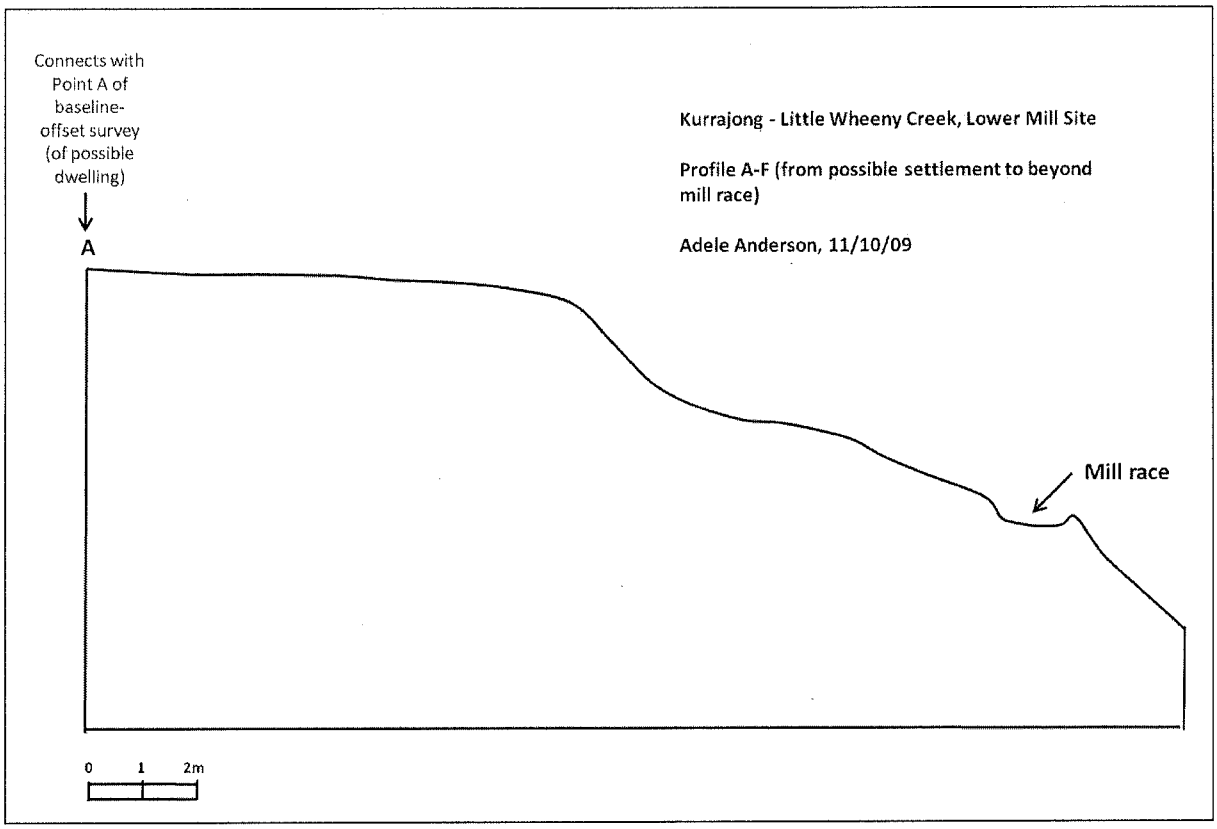


Figure20. Transect from possible settlement to beyond mill race

4.5 – Upper Mill

The remains of what is suggested by the KCHS to be the Upper Mill are located upstream from the Lower Mill and Dam areas. Though it was acknowledged that the Upper Mill was likely associated with the other areas, time and access constraints resulted in it being excluded from the study area for this survey.

5. Conclusion and Research Potential

This report is limited to a basic record of the visible material remains, rather than providing a comprehensive examination of the site. However, it nevertheless illustrates the enormous research potential of the site as a relatively intact industrial complex. Further investigation, including both archival research and fieldwork, would certainly be worthwhile.