

5 Aboriginal Life: Historical Context

5.1 Wiradjuri People in their Landscape

It is not easy to reconstruct past times, to imagine life in other periods and cultures. It is particularly hard when such a dramatic change occurred to Wiradjuri people as happened in the early nineteenth century. Killings, disease, the introduction of alien livestock and the loss of land and independence make it harder to reconstruct the past. We are forced to rely, for the most part, on accounts by settlers and others who, however well intentioned – or not - were trying to make sense of the changing Aboriginal world around them in the context of imperfect language skills, their own preconceptions, and the need to legitimise their acquisition of Aboriginal land. The rapid decline of the Aboriginal population and their movement between stations, reserves and missions, often outside their own local territories, led to new alliances, changing marriage patterns, loss of language, and new political identities. Wiradjuri authors, such as Mary Coe (1989) have drawn on historical records to supplement Indigenous oral histories. Historical evidence, however flawed, can offer insights that can inform both the consultation process and our understanding of the archaeological record.

5.1.1 Wiradjuri Land and Territories

The Study Area falls within a region known today as Wiradjuri country based on the shared language spoken by people who define themselves as 'people of the three rivers', these rivers being the Macquarie (or Wambool) the Lachlan (or Kalare) and the Murrumbidgee (or Murrumbidjeri). The high mountain ranges mark the eastern boundary of Wiradjuri country and the western boundary is marked by the shift from woodland to open grassland. (Coe 1989: 3). [Note, though, that although Coe and most other sources refer to the Macquarie as the Wambool, in the 1830s, Surveyor-General Mitchell, who consistently used Aboriginal names of natural features, always referred to its name in the lower reaches as the Wammerawa.]

Wiradjuri is the largest language group in New South Wales but most sources suggest that people generally lived in smaller groups, some of whom spoke different dialects of Wiradjuri. Pearson (1984) did extensive research into a range of historical sources which led him to the conclusion that each family group or clan would generally be based on a particular waterway or drainage catchment area with its river flats and open land where resources are plentiful and houses easy to construct. So, according to Pearson's historical evidence, it appears that there was probably one clan or local group based in the Wellington area; another in the Mudgee/Cudgegong/Rylestone area; another in the Bathurst Plain area; and others based on the Castlereagh to the north, the Bogan to the west, the Lower Macquarie to the north-west; the Belabula, the Lachlan and the Crowther to the south-west and so on. Gunther, a missionary at Wellington in the 1830s, who carried out the first European study of the Wiradjuri language, claimed that there were three distinct dialects spoken in the Wellington, Dabee/Capertee and Bathurst areas (cited in Pearson 1984: 64).

R.H. Mathews, a land surveyor who travelled widely with Aboriginal people throughout New South Wales in the late 1800s, described the Wiradjuri social organisation as 'a vast confederation'.

He wrote that this confederation was made up of a number of independent groups, each with its 'recognized hunting grounds' and that each group was named after some local feature in its district or other distinguishing name. These named groups spent much of the year divided into smaller groups, such as an extended family, most of whom were born in that locality and owned its forests and streams as a common

hunting ground by virtue of their birth-right (Mathews 1906:941-2). The town of Dubbo, to the north of the Study Area, for example, is named after the Dubba-ga, or the red ochre people, a local Wiradjuri group named after a natural feature in their country (Grounds cited in White, 1986:34).

The literature examined by Pearson suggests that the size of groups varied according to the seasons and might fluctuate between small family groups and gatherings of between 80-150 individuals. Evidence from early settlers suggests that the territory of these larger groupings had a radius of up to 65km (Pearson 1981:65, 75-76). They would split into smaller groups of about 20 individuals, hunting and collecting different foods on a daily basis along the rivers or in the hills and ranges. When seasonal resources were good, they would meet together in well-known places for feasting as well as ceremonial and social activities. Sometimes, they would meet up with neighbouring Wiradjuri clans for important ceremonies, such as 'the burbung' (Mathews 1901), or for the purpose of warfare against a common enemy. At other times, though, there would be disputes between clans, particularly over trespass or the abduction of women (Pearson 1984: 66; Folster n.d.: 47).

Gunther describes the Lower Macquarie and Castlereagh 'tribes' as allies against the Wellington and Mudgee 'tribes' (White, 1986:36). In his journal entry for 13 August 1837, he describes the sudden arrival at the Mission at Wellington of about 30 young men, their bodies painted with red, yellow and white ochre, prepared for war:

They had come to assist the Wellington Natives in a fight that is daily expected with Blacks from another quarter. All were, in their way, well armed, some of their wooden spears appeared to be from 10 to 12 feet long, as the wood is exceedingly hard, sharply pointed at the end, & sometimes poisoned; the instrument is more dangerous than one might expect. Another of their weapons is worked thin, like a sword, but bent, resembling a bow & its use is throwing. A third instrument might be called a kind of cudgel: it is a stick about a yard long, with a thick knob at the end. Their shield consists only of a piece of wood a few inches thick, which in the midst, on the back side, has a handle (Gunther 1836-42).

Mitchell (1848) discusses the death of a Bogan River elder who had been killed by a visiting war party from the Macquarie River. Pearson (1984:76) has suggested that one of the reasons for the success of European settlement, despite strong Wiradjuri resistance, was the lack of 'cohesive leadership and organisation'. While some local groups proved very successful at running guerrilla warfare against the invaders, there was no tradition of collective government to coordinate hostilities.

5.1.2 Daily Life and Resources

Most clans or local groups would have built substantial huts in their core areas. These villages would act as the home base from which people ventured on their seasonal round. Houses were made of saplings covered with bark panels stripped from trees. Seasonal residences would have been smaller and less permanent but built on the same principles.

For the Wiradjuri people, the major rivers and associated tributaries were their livelihood and supplied a variety of consistent and plentiful food including fish, water fowl and shellfish. On August 22, 1817, John Oxley, the first European to travel up the Macquarie River from the Wellington Valley, observed 'an abundance of fish and emus ... swans and ducks' as well as very large mussels growing among the reeds in many stretches of the river. Many, he writes in his journal, 'exceeded six inches in length, and three and a half in breadth' [15 by 8 cms] (Oxley 1820).

Food from the rivers was supplemented with kangaroos and emus, especially in those seasons when people moved away from the rivers. According to Thomas Mitchell, possums formed a significant part of people's diet, as well as being used for making warm winter cloaks, arm bands and other items of clothing. Mitchell, Surveyor-General of the Colony of NSW, conducted several expeditions into the area in the 1830s and 1840s. He wrote that possums were found in the hollow trunks of upper branches of tall trees which were climbed by cutting new notches (since according to Mitchell Aboriginal people never reused old ones). He wrote that cutting marks were very common on trees and described their distribution:

[O]n my journeys in the interior I knew, by their being in a recent state, when I was approaching a tribe; or when they were not quite recent how long it was since the natives had been in such parts of the woods; whether they had any iron hatchets or used still those of stone only; etc The notches made in climbing trees are cut by means of a small stone hatchet and, as already observed, with each hand alternately. By long practice a native can support himself with his toes on very small notches, not only in climbing but while he cuts other notches, necessary for his further ascent, with one hand, the other arm embracing the tree. The elasticity and lightness of the simple handle of the mogo or stone hatchet employed are well adapted to the weight of the head and assist the blow necessary to cut the thick bark with an edge of stone. (Mitchell 1839)

Vegetable foods formed an important part of the diet. While the western Wiradjuri groups towards the riverine plains country made extensive use of bulrush roots [*Typha*] and grass seeds [*Panicum decompositum*] as staple foods (Gott 1999a, 1999b, Tindale 1974, 1976), eastern Wiradjuri in the Study Area who lived on the slopes and incised plateaux had a rather different diet. Their country tended to be colder and wetter and grass seeds were not as consistent or nutritious. Daisy yams or 'myrnong' [*Microseis scapigera*], though, grew in abundance as did a range of other roots and tubers, including lily and orchid tubers and Kurrajong roots [*Brachychiton populneum*] (Gott 1983, White 1986: 57-58). Kurrajong and Acacia seeds would be ground for flour, as would certain grass seeds, such as oat grass or kangaroo grass [*Themeda australis*].

Overall, the eastern Wiradjuri had access to a wider and more consistent range of staple vegetable foods than their western neighbours and the area also provided many different seasonal nuts, fruits and herbs (Pearson 1981:342-349).

Trees were important in Wiradjuri life as a source of fuel, but also for the manufacture of tools and implements such as spears, shields, axe hafts, digging sticks, clubs and shovels. Bark was another important resource that was readily accessible to build houses, or to make canoes, coolamons and other containers. These activities have left their evidence on some of the remaining older trees in the area. Although stone formed

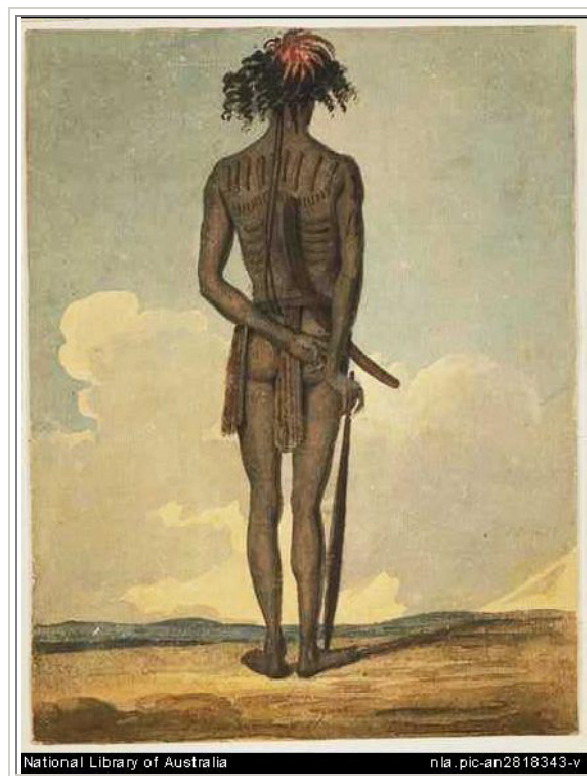
an important part of the daily tool kit, in riverine country such as this, large mussels would have been widely used as cutting and scraping implements.

According to Mitchell (1839), people often carried, as part of their tool kit, a small wooden shovel and used one end to dig up different roots, and the other to break into the large anthills for the larvae, which they ate. Folster (n.d.: 48), describing his observations in the Orange area, wrote that small children, as soon as they could walk, were given miniature versions of these shovels and would dig up their own larvae and eat them with relish. He also provided interesting detail of what women might carry in their skin dilly bags:

The contents of the dillies ... consisted of nets for the hair, or for catching ducks; whetstones, yellow ochre, red oxide or red ochre as well as white kaolin for painting the body; pins for dressing and drying opossum skins, or for net making, and small boomerangs and shovels which filled the same purpose that children's toys do today. (Folster n.d.:49)

The picture below, painted by a Augustus Earle, a European artist who visited the Wellington valley in 1826, shows some of the implements carried by a Wiradjuri man from the area as well as the raised scars that were proudly worn to demonstrate status and group affiliation (Cunningham 14 and 15 August, 1817).

Figure 7 Augustus Earle, 1826, Native of New South Wales from Wellington Valley. Courtesy of the National Library <http://nla.gov.au/nla.pic-an2818343>



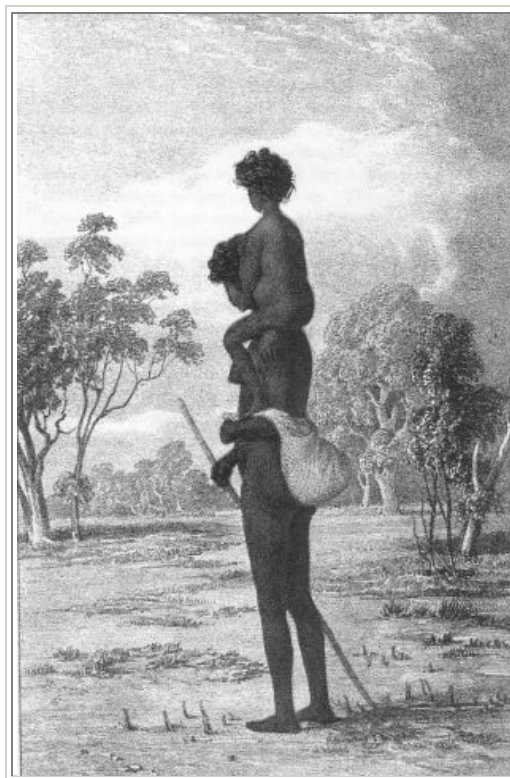
Honey was an important source of seasonal nutrition. In April 1835, Mitchell was passing near Goobang Creek, in the ranges to the west of the study area, and described Wiradjuri people showing the ignorant Europeans how to obtain honey:

We were now in a land flowing with honey, for our friendly guides, with their new tomahawks, extracted it in abundance from the hollow branches of the trees, and it seemed that, in the proper season, they could find it almost everywhere. To such inexpert clowns, as they probably thought us, the honey and the bees were inaccessible, and indeed invisible, save only when the natives cut the former out, and brought it to us in little sheets of bark, thus displaying a degree of ingenuity and skill in supplying wants which we, with all our science, could not hope to attain. Their plan was to catch a bee, and attach to it, with some resin or gum, the light down of a swan or owl; thus laden the bee would make for its nest in the branch of some lofty tree, and so betray its store of sweets to its keen-eyed pursuers, whose bee-chase presented, indeed, a laughable scene. (Mitchell 1839)

The many varieties of reeds and rushes that grew along the waterways not only provided food but were also extensively used to make mats, bags, baskets, nets, belts and headbands.

The image below (Mitchell 1839) shows an Aboriginal widow and child, who joined Mitchell's 1836 expedition on the Lachlan, carrying a woven bag.

Figure 8 Turandurey and her child Ballandella with the scenery on the Lachlan, 10 May 1836 (Mitchell 1839)

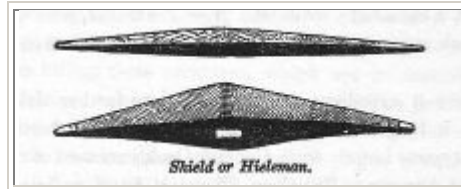


Mitchell described the widespread use of red and white ochre to decorate tools, weapons and clothing. He noted that men and women often wore a woven net band round their heads and/or waists and that the headband was invariably coloured with white or red ochre in the same way as a European soldier might whiten his belt.

He also described the widespread use of red ochre as body paint and as decoration for the carved, narrow shields carried by most of the men. Relations between different

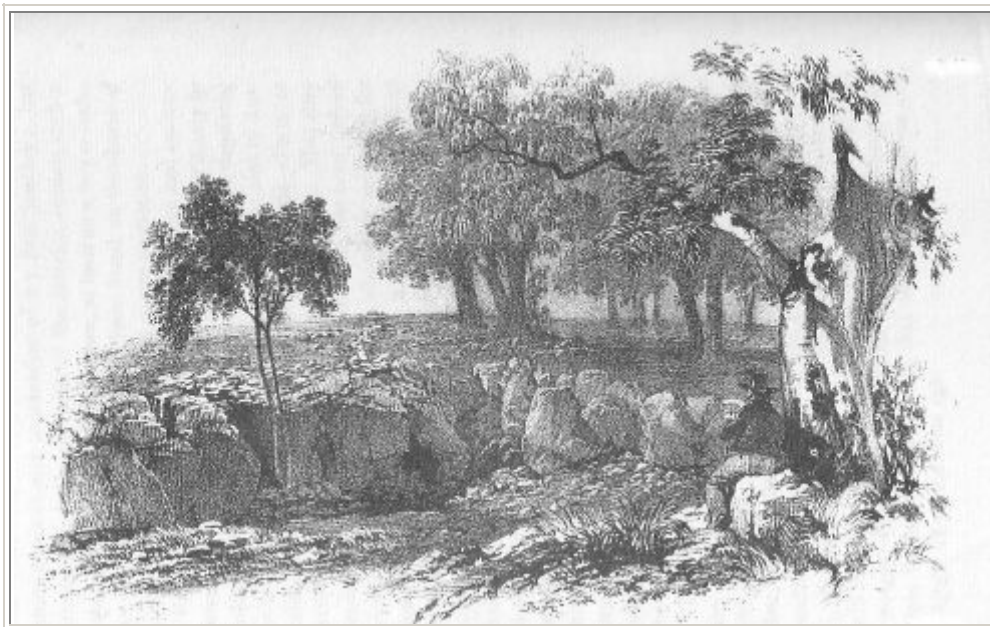
groups were not always amicable and these shields were used to deflect enemy spears and blows.

Figure 9 Narrow Shield (Mitchell 1848)



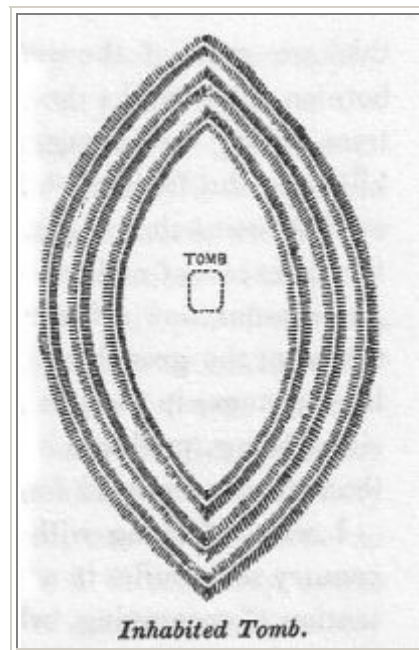
In his exploration of the Wellington Valley in 1831, Mitchell described veins of red ochre occurring within the limestone caves that rise along both sides of the river. This may well have provided a source for ochre in the region.

Figure 10 Entrance to the Largest Limestone Cavern at Wellington (Mitchell 1848)



The northern areas of Wiradjuri country are also well known for the elaborate burial ceremonies that were conducted on the death of important members of the group. These burial grounds were described in considerable detail by both Oxley (1817) and Mitchell (1839). They comprised a large, raised central tomb, often with a hut built on top, made of poles and bark sheets, where close family members used to keep vigil for a period of time. The tombs were surrounded by three raised ridges of earth, with the ground smoothed between them. The height of the ridges seemed to vary. Oxley described them as raised seats, suggesting that they are wide and high. The ridges in the one drawn by Mitchell in 1836, below, are described as small.

Figure 11 Diagram of an Aboriginal Tomb (Mitchell 1848).



It was common for the trees facing these burials to be elaborately carved with designs that were either specific to the individual or to their clan or group. One of these burial grounds, that of Yuranigh, one of Mitchell's most important guides on his expeditions, can be found at Molong (or place of many rocks), on the Mitchell Highway, 8 km from the proposed pipeline route. Mitchell described Yuranigh as a 'guide, companion and friend' and when he heard of his death, he paid for a headstone on his grave. Yuranigh was buried with carved trees at each corner of his grave.

Figure 12 Carved tree, Yuranigh's grave. Photo courtesy of the Heritage Branch, Department of Planning, NSW.
http://www.heritage.nsw.gov.au/07_subnav_19_02_01.htm



5.2 The Wiradjuri Meet the Invaders

Although the area around Sydney was colonised in 1788, the Blue Mountains presented an impenetrable barrier for many years, Governor Macquarie was keen to expand settlement into the interior and in 1813, Assistant Surveyor George Evans and an Aboriginal guide crossed the mountains, descending into a rich river system that he named the Macquarie. Hearing reports of the excellent pastureland, Macquarie ordered the building of 100 miles of road by convict labourers with soldiers for protection. When this was finished in 1815, Macquarie travelled into Wiradjuri country by coach and laid the foundation of the town of Bathurst, named after the British Secretary for War and the Colonies. Macquarie met with 15 Aboriginal men and boys during this visit, an exchange of goods took place, and settlers were given strict orders to treat them kindly (Pearson 1984: 64). This marked the beginning of a gradual incursion of settlers and their stock into Wiradjuri lands.

Figure 13 Augustus Earle [ca 1826]. King's Table Land, Blue Mountains, New South Wales. Water colour showing the appearance of the new road between Sydney and Bathurst, 1826? <http://nla.gov.au/nla.pic-an2818309>. Courtesy of the National Library of Australia



In 1815, Macquarie had restricted settlement of this new inland area to the east bank of the Macquarie and Campbell Rivers, with a Government station at Bathurst and small settlement at Kelso from 1818. According to Pearson (1984:69) for several years 'it remained a tightly government controlled settlement as regards land, labour and markets'.

Labour was provided by convicts; access was mainly restricted to government officials; a few people could graze stock under permit, but land was not generally open to occupation.

Nevertheless, surveyors such as Evans and Oxley continued to explore the southwest slopes in all directions, publishing their accounts of good grazing country and opportunities for colonial expansion. In 1815, Evans travelled south-west to the Lachlan

and in 1817 Oxley followed this route, then followed the Lachlan west into the plains country before cutting north-west back over the ranges to the Wellington Valley and the upper reaches of the Macquarie. Squatters and settlers authorized or not, soon followed in their tracks.

In April 1817, as Oxley headed south-west from Bathurst over the ranges towards the Lachlan, it is clear from his journals that his aim was to identify land for colonisation. On 23 April, he wrote: 'I never saw a country better adapted for the grazing of all kinds of stock than that we passed over this day'.

Figure 14 Augustus Earle [ca 1826]. View from the summit of Mount York, looking towards Bathurst Plains, convicts breaking stones, N.S.W
<http://nla.gov.au/nla.pic-an2818287> Courtesy National Library of Australia



When his party reached the Lachlan, they came saw a considerable number of Wiradjuri on the opposite side of the river. He wrote:

I went down opposite to them, and after some little persuasion about twenty of them swam across, having their galangar or stone hatchet in one hand, which on their landing they threw at our feet, to show us that they were as much divested of arms as ourselves. After staying a short time they were presented with some kangaroo flesh, with which they re-crossed the river, and kindled their fires. They were very stout and manly, well featured, with long beards: there were a few cloaks among them made of the opossum skin, and it was evident that some of the party had been at Bathurst, from their making use of several English words, and from their readily comprehending many of our questions. (Oxley, 1817)

The party set off down the Lachlan, meeting other Wiradjuri on 4 May who he describes as wearing possum skin cloaks and 'neatly worked nets bound round their hair'. He noted that all the men had one front tooth missing, no doubt as a result of

tooth avulsion, and that their faces were decorated with red and yellow ochre. They did not appear at all frightened by Europeans and had either met some or heard of them before.

Although full of praise for the country on the western slopes, by the time Oxley had travelled nearly 100 km down Lachlan, he was becoming unimpressed by the landscape if not the Murray cod:

These flats are certainly not adapted for cattle; the grass is too swampy, and the bushes, swamps, and lagoons, are too thickly intermingled with the better portions to render it either a safe or desirable grazing country. The timber is universally bad and small; a few large misshapen gum trees on the immediate banks of the river may be considered as exceptions. If however the country itself is poor, the river is rich in the most excellent fish, procurable in the utmost abundance. One man in less than an hour caught eighteen large fish, one of which was a curiosity from its immense size, and the beauty of its colours. In shape and general form it most resembled a cod, but was speckled over with brown, blue, and yellow spots, like a leopard's skin; its gills and belly a clear white, the tail and fins a dark brown. It weighed entire seventy pounds, and without the entrails sixty-six pounds (Oxley 1817).

He abandoned the Lachlan, heading north-west to find the Macquarie River and reported coming across cattle tracks north of the Wellington Valley in August 1817. It is clear that by 1819 roaming pastoralists had quickly taken advantage of the good grazing lands in Wellington Valley just as they had to the south and west of Bathurst around Molong (in 1819), Blayney (1821) and in the Belabula Valley around Canowindra (1829).

For several years, two very different cultures and economies tried to adjust to one another. Aboriginal people welcomed metal axes, white flour and other things that made their lives easier. In an exchange system, they provided some recompense for the felling of trees and the impact of fences and stock on traditional hunting and gathering activities. At the same time, Aboriginal practices, such as burning off country, were stampeding stock, destroying fences and becoming more of a nuisance to the colonisers.

After Governor Macquarie's departure in 1821, Governor Brisbane began to offer land grants and tenure to individual farmers. Very soon, it became clear to the Wiradjuri that the Europeans were here to stay; that they did not share the same values of reciprocity; and that their numbers were increasing. For instance, the European population of Bathurst in 1820 was 114; by 1824, it had risen to 1267 (Pearson 1984: 69-73).

Clashes between the new European settlers and the local Aboriginal people became common around Bathurst and beyond, marking the beginning of incidents that have been termed the 'Wiradjuri Wars' (Read 1988). These violent incidents and guerrilla tactics involved removal of cattle and spearing of stockmen by the Wiradjuri people in response to killing of their people as well as loss of their fishing grounds and significant sites (Coe 1989; HO and DUAP 1996).

So, in the early 1820s, relations between the original inhabitants and the invaders began to break down. While there is evidence of unlawful killings, abuse of women and distribution of poisoned flour, even the most trivial event could result in tragedy. In May 1824, a settler at Kelso offered some potatoes to an Aboriginal family who were passing. The next morning, the Aboriginal group returned and helped themselves to more. The settler fired at the group, killing some of them. As settlers started to take the law into their own hands, using guns or poisoning flour, Wiradjuri warriors, such as Windradyne, began to lead coordinated attacks on livestock and stockmen. It is

important to note, though, that individual settlers, such as Suttor, who had treated Wiradjuri people with respect and learned their language, were not molested (Coe 1989:40). On 14 August 1824, Governor Brisbane proclaimed martial law in the districts near Bathurst, and a troop of 75 armed soldiers was dispatched to the area to deal with 'the aggressions of the Aborigines'. Pearson (1984:78) writes that 'eight years of comparatively peaceful co-existence was followed by two years of violence'. During this period, it is estimated that 'between one quarter and one third of the Bathurst region Wiradjuri were killed' (Read 1988:10).

A price was put on the head of Windradyne (called Saturday by the Europeans) as the killing escalated on both sides. Martial law was terminated on 11 December 1824 and on 28 December of the same year, Windradyne and other Wiradjuri walked over 194 km to Sydney to the annual meeting of the 'native tribes' at Paramatta which had been started by Governor Macquarie in 1816 and continued until 1830. Windradyne arrived wearing a hat with a sign on it saying 'Peace' and he was formally pardoned by the Governor. Shortly after, the Governor and senior military men involved in the declaration of martial law were removed from their posts (Coe 1989; Read 1988; Pearson 1984).

Figure 15 Augustus Earle [ca 1826]. The annual meeting of the native tribes at Parramatta, NSW. Courtesy National Library of Australia, Rex Nan Kivell Collection NK12/57.



After the removal of Macquarie's restrictions, European settlements had spread first along the river systems and alluvial flats where there was good pasture for cattle and the heavy work of land clearance could be avoided. As the main river frontages were taken up, settlement spread along the river tributaries into the ranges. So, stock moved west along the Murrumbidgee and Lachlan Rivers, south-west along the Belabula and the Crowther and north up the Macquarie, the Bell, the Bogan, the Cudgegong and the many smaller rivers in the region.

Mitchell, in the journals of his expeditions, frequently wrote of the impact of stock on the Wiradjuri landscape. This is his description, written in 1832, of the impact of cattle near Goobong Creek to the west of the Study Area:

We had encamped near those very springs mentioned as seen on my former journey, but instead of being limpid and surrounded by verdant grass, as they had been then, they were now trodden by cattle into muddy holes, where the poor

natives had been endeavouring to protect a small portion from the cattle's feet, and keep it pure, by laying over it trees they had cut down for the purpose. The change produced in the aspect of this formerly happy secluded valley, by the intrusion of cattle and the white man, was by no means favourable, and I could easily conceive how I, had I been an aboriginal native, should have felt and regretted that change. (Mitchell 1839)

According to Mitchell, the intrusion of cattle alone was sufficient to destroy Aboriginal capacity to live freely in their land. Cattle destroyed water holes and camp sites and they competed with kangaroos and local mammals, forcing them out.

In addition, every white stockman had several strong kangaroo dogs with which they hunted the remaining kangaroos. In Mitchell's view, if Aboriginal people were shown no mercy when they helped themselves to a bullock or a sheep, then at the very least, Europeans should be forbidden to kill kangaroos (Mitchell 1848).

In addition to Governor Brisbane's land grants to individuals, he also established a number of new Government Stock Stations, including the Wellington Agricultural Station. This remote convict stock station at Wellington Valley was intended for "gentlemen" convicts and it ran as such from 1822-1831 (Pearson 1984: 69; HO and DUAP 1996:90).

Figure 16 Augustus Earle [ca 1826]. Wellington Valley, New South Wales, looking east. Water colour showing the new Government settlement. <http://nla.gov.au/nla.pic-an2818294> Courtesy of the Australian National Library.



The convict stock station was designed as a self-sustaining operation as well as a supply base for free settlers, who were increasingly taking up land in the area. As the convicts were largely unskilled in agricultural practices, the settlers did not need the convicts' services and preferred to grow their own produce. The Government Stock Station soon failed and most of it was handed over to the Church Missionary Society (CMS) in 1832.

After the conflict, settlers' concerns about the dangers of the Aboriginal people began to diminish. Disease had begun to have a serious impact on the Wiradjuri population, already reduced by killing and the loss of their economic base. As their numbers and independence decreased, well-intentioned Christians sought to assist the survivors.

In 1833, the mission began its work in the Wellington Valley and in 1837, the Reverend James Gunther arrived with as keen a desire to learn the Wiradjuri language as to convert and educate the people. His letters and diaries provide insights into the mission, its work, and its failures. Günther's journals suggest that the Mission served

mainly as a source for goods valued by the Wiradjuri, such as food and tobacco, clothes and blankets but that few were converted to Christianity. These records have been digitised and are available online (Carey and Roberts eds 2002; Gunther 1836-42).

According to Read (1988: 19) 'the missionaries failed because they saw no value in any of the Aboriginal traditions ... [and] also because of their humourless and dour version of fundamentalist Christianity, darkened by punishment and fear'. He may have been misguided and authoritarian in his approach, but Gunther's linguistic documentation has proved invaluable to later generations of Wiradjuri. He also wrote condemning violence against Wiradjuri people and claiming that massacres were still taking place in the region.

The mission also had to compete with the attractions of independent life in Aboriginal camps on the riverbanks as well as the ability of many Wiradjuri and their families to obtain casual employment on local farms: felling timber, clearing land, cutting bark for roofing and shepherding. Gunther also noted that others, despairing at the loss of their land and traditional lifestyle, as well as the loss of kin to violence and new diseases, had fallen victim to alcohol. He left the Wellington Valley in 1843 and the mission closed a few years later. The mission site is now under the management of National Parks as Maynggu Ganai Historic Site (Griffin NRM 2004).

Meanwhile, European settlement had radiated out from Bathurst throughout Wiradjuri country. In 1829 legal occupation by graziers began to the west in the parish of Orange, with small settlements growing up on the properties along what is now the Mitchell Highway. In 1844 a plan for a township was drawn up.

William Lee of Kelso is said to have had cattle in the Molong area by 1819 and in 1826 a military and police outpost was established at Molong, on Governor Darling's orders, as a step in opening up the government stock reserve west of the Macquarie River for settlement.

To the south, George Evans, explorer and government surveyor, passed through what is now Blayney in 1815 and unofficial occupation of the district began as early as 1821. The first official land grant in the general area known as Coombing Park was issued to Thomas Icely in 1829 and in less than ten years, a mill, inn and several houses had formed the basis of a permanent settlement. Governor Gipps proposed the creation of a village to be named Blayney in 1842.

Also in 1815, Evans continued south-west towards what is now Cowra, entering the Lachlan Valley and naming the area the Oxley Plains after his superior the surveyor-general, John Oxley. A Military Depot was established at Soldiers Flat near present day Billimari. Despite the bad reports, settlers began to move into the Lachlan Valley in the 1830s.

The small settlement of 'Coura Rocks' began in 1840 at the site of a ford where people could cross the Lachlan River. By 1847 the settlement had become known as Cowra and the village was proclaimed in 1849.

Further west, on the Belabula River, a white settler, James Collits was recorded as occupying land at 'Canoundra' in 1831, though he may have arrived as early as 1829. The Canowindra Inn was established in 1849 and a settlement developed in a piecemeal fashion around the bullock trail that passed nearby. The town was surveyed in 1860.

The area around what is now Young, at the southern edge of the Study Area, was first settled in the early 1840s. James White entered the area as a squatter and in 1842 an early map identifies him as the owner of Burrangong Station on Burrangong Creek. He

ran sheep and cattle and after a while, began to specialise in raising and breaking horses on the river flats that had been known as Lambing Flat. According to local sources (Bayley 1977), James White and his family were noted for their good relations with Wiradjuri owners of the area.

By the middle of the nineteenth century, most of the Wiradjuri had either been dispossessed of their lands or were trying to adjust to a radically changed landscape.

5.3 Changing Patterns of European Land Use

5.3.1 Pastoralism

In contrast to the Blue Mountains that were not well suited to grazing, the rolling plains, open woodlands and plentiful expanses of grassland in the Study Area were viewed as ideal pastureland for stock in the initial years of European settlement and pastoralism dominated the region. Initial colonisation of the Bathurst Plains during the 1820s, and the demand for new grazing lands drove pastoral expansion into the outlying regions. (HO and DUAP 1996).

During the 1830s and 1840s, settlement continued and large properties were taken up, initially running cattle with some changing to sheep later on. By the 1840s, fear of Aboriginal attacks had subsided, the population increased significantly and sheep and cattle numbers grew. Large pastoral properties developed around Mudgee and Rylstone, which became towns in 1837 and 1842 respectively.

As settlers began to plant wheat and other crops for local use, the fertility of the soils in the area became evident and a gradual shift to mixed farming and agricultural production in the area began. (HO and DUAP 1996).

5.3.2 The Gold Rush

The search for gold dominated many areas of Australia in the second half of the nineteenth century. The 1850s gold rush caused people to flock to the Central Tableland, particularly in the areas surrounding Bathurst, Orange and Mudgee. With the discovery of gold near Orange in 1851, Bathurst in 1856, and Lambing Flat (Young) in 1860, rural towns in the region were deserted as men left in droves for the goldfields.

Later goldfields and townships sprang up closer to Wellington near Mookerawa Creek, Mitchells Creek and the Macquarie River. Large tracts of land were locked up as gold-field reserves, and used in the meantime to run sheep (AMBS 2008).

The discovery of gold near Parkes and Peak Hill led to an increase in settlement and development of their districts. Gold was first discovered near Parkes in 1862 leading to the emergence of Parkes as a large urban centre. The 1880s and 1890s saw gold rushes in the Tomingley and Peak Hill districts, where townships grew to service the mines (AMBS 2009).

The discovery of gold at Young in 1860 and Temora, further west, in 1869 attracted large numbers of miners to the western slopes resulting in disturbance to waterways and the felling of timbers to fuel the steam dredges. (HO and DUAP 1996).

The influx of miners and their families, led first to tent cities, followed by the construction of slab houses with bark roofs, resulting in further deforestation. Eventually new towns grew up to service the mines. It was a period of dramatic change which had further impact on the Wiradjuri people. Although some found employment, particularly in the timber industry, the massive influx of migrants and settlers resulted in further deterioration of their culture, way of life, and encroachment upon their lands. The flood of migrants and settlers also led to increased disease and alcohol availability (HO and DUAP 1996:91).

Although gold was not the only mineral mined (Molong, for instance, was the site of the first copper mine in Australia), the gold rush drove the increase in population in the region. Gold is still being produced in Wiradjuri country: at Cadia, just outside Orange, and at Lake Cowal near West Wyalong.

5.3.3 Agriculture and Farming

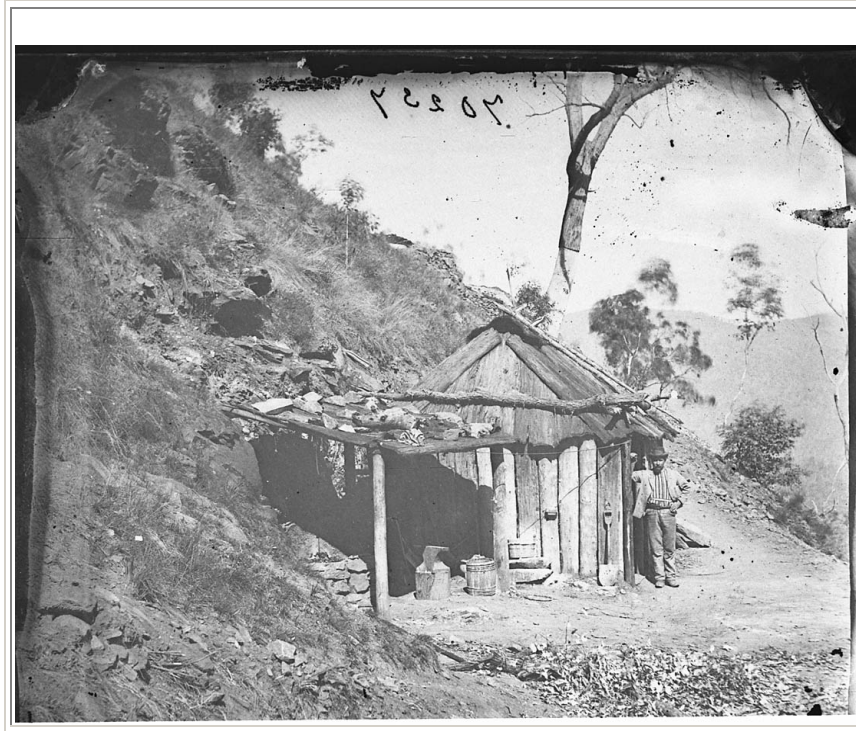
Pastoralists soon became aware of the agricultural potential of the river flats and many began to grow wheat and other crops in addition to running cattle and sheep. As the population of the region increased during the gold rush, meat prices soared and there was also increased demand for wheat and other crops. Increased stock numbers led to further occupation of land and to accommodate this ongoing development pastoralists cleared what was left of the uncleared land in the area, sinking wells, building dams and fencing the land as they went (HO & DUAP 1996).

The arrival of the railways and the ability to transport food quickly to central markets saw increased diversity in agricultural production. Orange became an important agricultural centre and in 1860 it was proclaimed a municipality. The arrival of the railway from Sydney in 1877 accelerated agricultural development and the city is now a well known fruit growing district, producing apples, pears, and many stone fruits such as cherries, peaches, apricots and plums. In recent years, a large number of vineyards have been planted in the area for a rapidly expanding wine production industry.

Figure 17 Family outside a slab house with bark roof at Hill End, NSW, a gold mining town. Source: Mitchell Library Home and Away Collection PXA 4999, Open Access Collection no: 39207.



Figure 18 A goldminer and his hut next to his mine at Hill End, near the Study Area.
Source, Mitchell Library Home and Away Collection PXA, Open Access
Collection no: 39628.



Blayney too benefited from the arrival of the railway which boosted agriculture in the region as the town became a major service centre to local farmlands with an abattoir, tanneries, butter factory and freezing works. Lucerne, first grown in 1863, is still grown on the rich river flats along the Belabula River and has also become a major crop throughout the region.

Commercial fruit growing emerged as a successful enterprise around Young by the end of the nineteenth century and this new agricultural industry became increasingly viable once the railway reached Young in 1885. Crops included apples, quinces, pears, plums, grapes, oranges and in particular, cherries.

In the Wellington district, grazing is still widespread but the fertile river flats of the Macquarie and Bell Rivers are intensively cropped. Market gardens produce vegetables, irrigated fodder and cash crops, including lucerne, maize, and peas. Much of the land in the area is used for mixed farming of winter cereals, cattle and sheep, but there are also several dairies. (AMBS 2008)

The whole bioregion today is a major producer of cattle, sheep, wool, wheat and other cereals, as well as a wide range of fruits and vegetables. The impact of both pastoralism and agriculture on the original Wiradjuri environment has been significant (NSW NPWS 2003).

5.4 Wiradjuri Survival in the Changing Landscape

Dramatic and life-changing as they were, these changes did not result in the end of the Wiradjuri or their culture. Many families continued to live and work on stations or to move between them, carrying out seasonal tasks, such as clearing, fencing, shearing, fruit picking or other agricultural work, in a modified version of their traditional economy. Many families possessed horses, sulkies and buggies and had well known beats that led them on a regular seasonal round from station to station. Between jobs, they might live for a while on a riverbank within their traditional country and catch up with friends and family. In this way, the Wiradjuri played an important role as part of the rural economy, interspersed with periods of self-sufficiency (Taylor and Undy 1994; Kabaila 1996, 1998).

In the early years of colonial settlement, there are many reports of young Aboriginal men working as stockmen and horse-breakers. Robert Porter, founder of the first newspaper at Wellington, described how easily the young men could be taught to ride and what excellent stockmen they made. He also provided interesting detail of the role of Aboriginal people in providing settlers in the Wellington area with bark (Porter 1906:11):

The older men were experts in stripping bark, which, with green hide, were the necessities of that day, the same as corrugated iron and wire are the necessities of to-day. A settler would ask a blackfellow to get some bark, and he would disappear for a week perhaps; then he would return and show a stick upon which were notches representing the number of sheets he had stripped. The settler would then get a dray and horse and accompany the black into the bush and load them up, paying a customary fee per sheet.

Lee Thurlow at Wellington drew our attention to an interesting book, *Australian building: a cultural investigation* in which the author, Miles Lewis, makes the case that early European bark construction methods were learned from Aborigines, who had developed techniques of stripping and curing bark for dwellings, canoes and other purposes. Aboriginal people not only showed the new arrivals which species, such as box, stringybark, and black butt, were best for building purposes; they also showed them how to strip bark. Lewis suggests that European metal axes provided Aboriginal people with the technology to cut bark on a large scale, allowing them to earn a living. He quotes from an account by Dawson in 1826 where he describes a group of settlers in New South Wales who had built wooden frames for dwellings but needed material to close the sides and cover the roofs:

Seeing their plight, a local Aboriginal brought a dozen of his fellow tribesmen to assist. They, having received each a small hatchet, set to work in good earnest, and brought such a quantity of bark in two or three days as would have taken our party a month to procure. Before a white man can strip the bark beyond his own height, he is obliged to cut down the tree; but a native can go up the smooth and branchless stems of the tallest trees, to any height, by cutting notches in the surface large enough to place the great toe in, upon which he supports himself, while he strips the bark quite round the tree, in lengths from three to six feet. These form the temporary sides and coverings for huts of the best description.

Dawson also described Aboriginal people stripping bark by standing on a forked stick some three metres from the ground, and performing the task 'in less than half the time that a white man could have done it upon terra firma.' (Lewis 1998: 2.01.3)

Although bark roofing had become largely replaced by corrugated iron in the early 1900s, Aboriginal people continued to adapt to changing technologies and labour requirements in order to stay close to family and country.

In 1883, with the establishment of the Aborigines Protection Board, the state began to try to control the lives of Aboriginal people. Two stations at Warangesda and Brungle were established within southern Wiradjuri country and hundreds of Aboriginal reserves were created across the state. For the next 80 or so years, Wiradjuri people had to deal with government policies that pushed and pulled, regularly changed direction, either seeking to exclude them from mainstream society, or trying to absorb them into it, or both. Keeping families together became a priority in the face of policies attempting to separate parents and children, husbands and wives, on the basis of ancestry or skin colour. Over the years, missions and reserves were established, had their management changed, or were revoked. When Aboriginal people tried to set up their own living areas, on the fringe of towns, or on the riverbank, they were often shut down or taken over by the Protection or Welfare Board who would impose policies and determine who could stay there and who had to move on (Read 1984; 1988).

Many people tried to maintain their independence by keeping on the move. So, Wiradjuri from the Study Area may well have spent time at Nanima, Bell River Flats, or the Town Common in Wellington; at The Springs in Orange; at Erambie or the Bag Camp in Cowra, or Gooloogong or Bulgandramine in nearby towns; or further afield at Warangesda at Darlington Point; at Brungle near Tumut; at the Sandhills in Narrandera; on Wattle Hill in Leeton; at Three Ways in Griffith or in Condobolin, Wagga Wagga, Cootamundra, Young, West Wyalong or the many other towns in Wiradjuri country.

Many Wiradjuri still talk of the old red huts, the institutional housing provided on the reserves, and recall good and bad times on the different reserves (Read 1984a, 1988; Kabaila 1996, 1998; Taylor and Undy 1993).

After the 1967 Referendum and the gradual dismantling of discriminatory government policies, a new era began that was full of promise as well as disappointments. Wiradjuri people, many with a long history of political activism, began to assert their rights and demand action.

In 1980, Wellington Kooris founded a Wiradjuri Aboriginal Elders Tribal Council to look after regional issues, including sites of significance, and to prepare land claims (Macdonald 2004: 9). In 1982, a number of people from other towns, including Cowra, decided to form an organisation to fight for land rights. Mrs Agnes Coe suggested calling the regional group 'Wiradjuri' to try to raise awareness of the long and strong shared history of the different groups. From this, a Wiradjuri Land Council was formed with foundation members from Cowra, Orange, Wellington and Wagga Wagga. Hewitt Whyman (who went on to become Chair of the Wiradjuri Aboriginal Land Council) argued that the main goal of this overarching organisation was to unite people from different communities, to strengthen their claims by sticking together. (Macdonald 2004: 10).

In 1983, the NSW Aboriginal Land Rights Act was passed and while this seemed like a cause for celebration, not everyone was happy. Many people opposed the revocation of numerous former Aboriginal reserves that was legislated at the same time. Others felt that the legislation did not put enough power or funding in the hands of Aboriginal people.

Under the new legislation, the unified Wiradjuri group became the Wiradjuri Regional Aboriginal Land Council comprising many local Aboriginal land councils (LALCs), including Cowra, Orange and Young LALCs who have interests in the Study Area. Not all Wiradjuri, though, became part of this new organisation. Wellington and Dubbo LALCs became part of the Central RALC.

For many years, LALCs carried the responsibility for looking after Aboriginal heritage in their areas and were the principal body consulted about developments. Members of land councils did not, though, have to be traditional owners of an area, although most land councils would refer questions about local heritage to appropriate people.

Following Native Title legislation in 1993, things have changed. Since the passage of this legislation, the ability to demonstrate traditional connections to country has become more important than residence in an area, no matter for how long. So, while land councils still retain certain rights and responsibilities, other groups, such as native title claimants, also have rights. Aboriginal people are still debating many of these issues. While some wish to retain the cohesion of the broader regional Wiradjuri grouping, some wish to see rights over heritage based at the smaller, local level, rather like the local clans described in Section 5.1.1. Others still prefer the former land council model which allows all those living in an area to participate.

This can make effective consultation difficult for outsiders, but with good will by all parties, Aboriginal heritage and culture can be protected and knowledge passed on to future generations of Wiradjuri.

Numbers of Wiradjuri people today have moved to towns and cities outside their traditional country, but most retain a level of connection with their homeland. Many, though, still live in their traditional country, maintain a keen interest in their heritage and its protection, and work to ensure that their rights are maintained.



EJ McGrath, Keith Freeman, Allan Hampton, Tim Hampton

6 Changing Land Patterns and Previous Land Disturbance

6.1 Anthropogenic Impacts on Landscape

Early Europeans entering into the area described open grasslands and stands of trees, ideal pasture for the stock they were moving in. Most of them assumed that the landscape that they were observing was natural. Surveyor-General, Thomas Mitchell was one of the few who recognised the role that Aboriginal people played in constructing their landscape:

Fire, grass, kangaroos, and human inhabitants, seem all dependent on each other for existence in Australia; for any one of these being wanting, the others could no longer continue. Fire is necessary to burn the grass, and form those open forests, in which we find the large forest-kangaroo; the native applies that fire to the grass at certain seasons, in order that a young green crop may subsequently spring up, and so attract and enable him to kill or take the kangaroo with nets. In summer, the burning of long grass also discloses vermin, birds' nests, etc., on which the females and children, who chiefly burn the grass, feed. But for this simple process, the Australian woods had probably contained as thick a jungle as those of New Zealand or America, instead of the open forests in which the white men now find grass for their cattle. (Mitchell 1848)

The Wiradjuri landscape in the 1820s was not a natural wilderness. It had been carefully managed for thousands of years by people who had learned how to look after their country to ensure the continued supply of its resources.

A number of different land development practices have taken place in the region over the last 200 years.

Some land has previously been subject to major disturbances including road and track construction, trenching activities, irrigation ditches, tree clearing and stock, and arable agriculture. The region has been subject to tree clearance since the pastoral industry first became established in the 1820s. Arable agriculture became more widespread from the 1870s.

Soil has been lost from some areas, particularly the higher ground, cleared land and from incision of river channels. Much of the region has been subject to ploughing. All of these may affect the integrity of sites and features. Lithic items, common in the region, would be unlikely to be damaged by the plough unless they were larger items such as grinding dishes. Features such as earth ovens and earthen mounds would often be totally destroyed by ploughing, depending on depth, which is often in the range of 20 cm to 25 cm. Even though ploughed, earthen mounds may still be visible.

Some areas of soil aggradation are the result of erosion toward the waterways. These may obscure objects that were previously on the surface, but would not have affected earthen mounds or scarred trees.

6.1.1 Land Clearance

Land clearance in the 19th and early 20th centuries was widespread and had a major impact. Clearance of trees by chain, chopping and fire was widespread and had a considerable impact on Aboriginal cultural heritage.

This was exacerbated by uprooting of trees by digging, horse team, or later use of motorized tractors, which disturbed the ground to considerable depth. Remnants of the forested areas are to be seen where road reserves have not been cleared, and in small pockets scattered across the country, particularly in the low ranges. Regrowth has occurred along many road reserves, however. There were always large areas of open

grassy plain which would not have been affected in this way, but which were subject to damage from stock and agricultural plough.

6.1.2 Agricultural Ploughing

Agricultural ploughing has taken place over much of the study area. Increasing mechanization associated with broad acre agricultural ploughing has destroyed the detailed archaeological context of many, if not most, of the sites, particularly earthen mounds.

6.1.3 Road Construction

Construction of formed roads has taken place over much of the region.

6.1.5 Fire Breaks

Fire breaks are usually ripped along road sides and fence lines. Fire breaks generally avoid mature trees. Ripping may cause damage to archaeological sites, particularly earthen mounds, ovens and residential areas defined by culturally modified soils. Individual lithic items, although rare in this instance, are generally not damaged by ripping, although the larger the item, the more likely it is to be damaged.

6.1.6 Stock

Damage to sites from trampling has occurred. Unfortunately, sheep and cattle like to congregate on the higher ground of earthen mounds, exacerbating erosion. This phenomenon is noted throughout the world where earthen mounds are found.

6.1.7 Rabbits

With the decline in rabbit numbers following Myxamatoxosis and Calicivirus controls, few rabbits are currently seen in the Region. Records from the late 1800s, however, document the severe damage to the environment that was wrought by the explosion of rabbit numbers (Hallam 2005; Falla 2004). Virtually all sandy rises were subject to infestation with rabbit warrens.

6.1.7 Mining

While highly localised, mining may have had a significant impact on quarries and associated working areas.

6.2 Summary of Land Disturbance Impacts

Past land disturbance has had a significant and often under-appreciated impact on the land. Clearing has probably destroyed some mounds that may have been near rivers, and certainly most of the CMTs, leaving only rare specimens from before 1820s. Most CMTs recorded probably date from after this time.

Significant ground disturbance from many of these impacts would have contributed to the disturbance and destruction of many archaeological sites. Stratigraphic integrity may be lost, as well as detailed evidence from soils including charcoal and ash that may define residential areas, small bones and plant remains (where soil conditions allow for preservation). Sites would then only be recognized from the presence of lithic items and/or heat retainers. Heat retainers share characteristics with naturally burnt termite nest and clay from within tree trunks.

Many of these impacts were wide-spread, and it is possible that disturbance to the surface over a large area may have taken place at any given location. It may not be possible to identify any damage today.

7 Previous Archaeological Work

A number of archaeological studies have been carried out in the wider region (Pearson 1981; OzArk 2007; Allen, 1998; Bowdler 1982; Cubis 1982; Pardoe 2005, 2007a, 2007b, 2009). There have been several archaeological investigations within 3 km of the proposed pipeline (Witter 1980; Lance 1985; McIntyre 1985; Bonhomme 1986; Davies 1993, Lilley 1993). A number of surveys have been conducted within 25 km of the Project Area (AMBS 2008; Kohen 1996; Barber 1993; Thomas 1984; Mills and Kelton 2003; Dallas and Smith 1989; Kelton 1991, 1999; Griffin 2004).

Pearson carried out a very detailed study of the region for his 1981 PhD. There is considerable detail in this thesis, including historical and ethnographic data, site survey, and excavations. Pearson describes the environment through which the proposed pipeline traverses as one transitional between the cold and wet climate of the Divide and the hot and dry climate of the western plains. Sites usually measure 63-66 m in diameter, rising to 186 m in the vicinity of Wellington. On average, the sites are less than 100 m from water, mostly occurring in open woodland. Sites may occur on any of several landforms, including gently undulating plain, creek bank or floodplain, and ridge.

Excavation of several rock shelters indicated that there was considerable variation in number and density of lithic items at each site. Two excavations closer to the proposed pipeline, Granites 1 and 2, produced densities and numbers of lithic items much lower than an excavation in the vicinity of Mudgee. A total of 5 flakes out of 264 lithic items was found in a 1 x 1 m excavation. The top layer dated to $1,200 \pm 60$ BP [ANU 1725], with a date of $5,150 \pm 80$ BP [ANU 1726] at 15-20 cm, and a basal date of $7,150 \pm 140$ BP [ANU 1727]. The position of this rock shelter is somewhat anomalous for the region, being in an area of granite boulders. Even so, a pattern of greater usage of quartz [73%], with much of it being flaked, appears to be consistent over the wider region (Table 1). This is typical of many areas where quartz and flakeable stone both occur. Quartz is valued for its toughness and edge holding, though less malleable in manufacture.

Table 1 Lithic Items from the Granites 2 Rockshelter

Item	<1cm	>1cm	n	%
qtz flake	32	66	98	37
qtz flaked piece	18	77	95	36
non-qtz flakes	4	37	41	16
non-qtz flaked pieces	4	25	29	11
Totals	58	205	263	100

7.1 Summary of Previous Studies

A survey of an electricity transmission line, with subsequent test excavation (Navin Officer 2002, 2003, Mills and Kelton 2003) identified 15 sites and 12 PADs, of which 9 and 4 respectively are in the study area. Most stone artefact sites consisted of fewer than 4 lithic items.

Of the total number of objects recorded [454], 65% were flakes [including flake fragments] and 10% were cores (Table 2). Tools were fairly common [8%] and several less common object types were represented, including grinding dishes [upper and lower], hammers, and edge-ground hatchet heads

Table 2 Artefact types in the Region (Mills and Kelton 2003)

Artefact Type	Totals	%
Flake	228	50.2
Flake Fragment	68	15
Core	49	10.8
Scraper	28	6.2
Backed Blade	10	2.2
Manuport	11	2.4
Lower Millstone	3	0.7
Upper Millstone	3	0.7
Block Fractured Fragment	31	6.8
Indeterminate	11	2.4
Ochre	1	0.2
Hammer	9	2
Pebble Axe	1	0.2
Hatchet	1	0.2
Totals	454	100

Since the distribution of materials is so variable, each locality would be expected to have a different mix of materials. For the cited study, near Molong, indurated mudstone and quartz form the most common flaking material (Table 3).

Table 3 Raw Materials in the Region (Mills and Kelton 2003)

Material	n	%
Indurated Mudstone	157	34.6
Quartz	117	25.8
Volcanic	54	11.9
Quartzite	40	8.8
Chert	26	5.7
Silcrete	25	5.5
Metamorphic	15	3.3
Porcellanite	11	2.4
Sandstone	3	0.7
Jasper	3	0.7
Fossilised Wood	2	0.4
Ochre	1	0.2
Total	454	100.0

A pipeline survey carried out between Young and Wagga Wagga (Witter 1980) documented two sites in the region, close to Young. These were surface stone artefact concentrations measuring 150 x 390 m and 50 x 200 m. One of the sites had been disturbed by the plough. The main items found were quartz debitage. The assemblages contained flaked tools, backed blades, hammers and cores.

A site on a spur of ground at the junction of the Lachlan and Boorowa Rivers (E693xxx, N418xxx; Thomas 1984) contained 17 lithic items, of which 10 pieces were debitage. The materials were quartz and silcrete. Two of the flakes were snapped blades.

A survey of a 145 km transmission line (Lance 1985) located 16 stone artefact concentration, with 9 sites containing fewer than 10 lithic items, 5 sites between 10 and 100, and 2 sites more than 100.

A survey near Wyangala dam, approximately 30 km east of Cowra, provides an indicator of site type and distribution on major streams. Even though well east of the study area, this study (Barber 1993) documented 8 sites in an area of about 4 ha. All sites were stone artefact concentrations. No size of site was supplied, so densities cannot be calculated. Most artefacts were lithic items of quartz, which appears to be debitage from block fracturing and fault line acceleration techniques (Witter 1992, rather than flaked stone. In any event, the quality of quartz determines flakeability.

Table 4 Number of lithic items in 8 sites on the edge of the Lachlan River at Wyangala Dam (data from Barber 1993)

Site #	n	%
1	7	6
2	2	2
3	3	3
4	5	5
5	41	38
6	2	2
7	2	2
8	47	43
Total	109	100

In a study running roughly parallel to the present study (AMBS 2008), 25 sites were known.

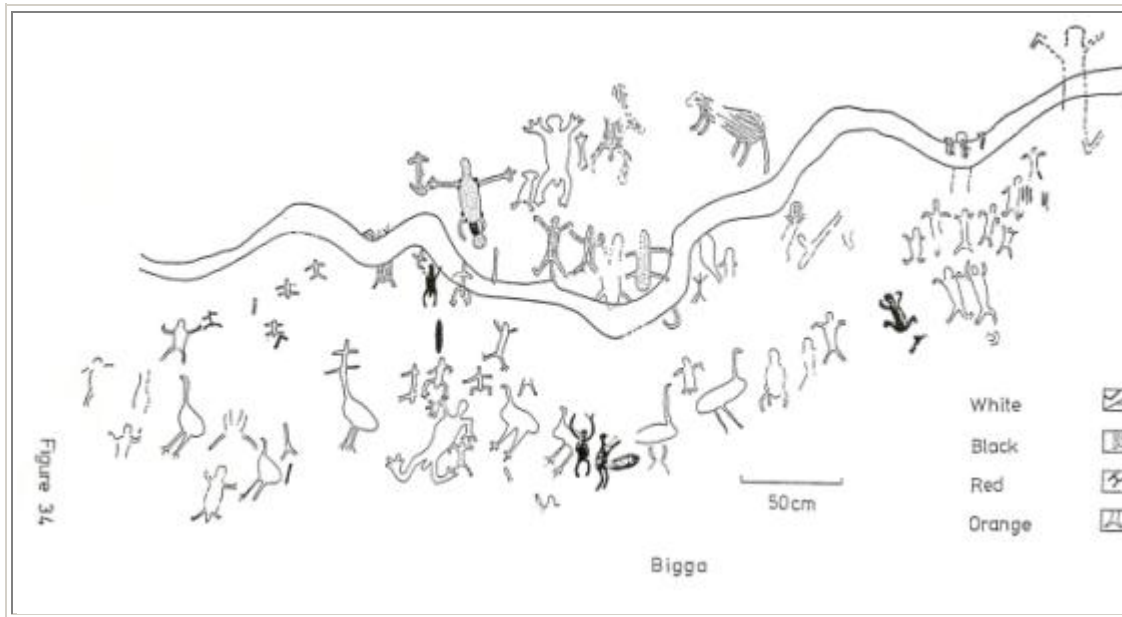
Table 5 Site types recorded during a survey for a gas pipeline between Wellington and Alectown (AMBS 2008). This survey runs roughly parallel to the northern part of the present study

Site Type	n	%
Artefact Scatter	13	52
Scarred Tree	6	24
Burial Mound, Carved Tree	2	8
Bora Ground	1	4
Grinding Grooves	1	4
Stone Arrangement	1	4
Stone Cairns	1	4
Total	25	100

The information collected to date, although sparser than one might wish, indicates some consistency in site type distribution, and the characteristics of sites defined by lithic items. These are typically fairly small sites in number and density, which may vary in size between 30 m and 200 m in diameter. As such it is likely that the stone merely indicates the presence of a residential area. The stone to be expected is variable, although quartz makes up a sizeable fraction.

Rock art is rare in the region, depending on suitable rock faces in rocky ranges. One site, near Bigga, has been well studied (Kelton 1991). It is approximately 40 km to the east of the study area and although it is unlikely that such a large site would be recorded during survey, rock art may be found in rocky areas.

Figure 19 Rock Art near Bigga (Kelton 1991), Approximately 40 km from the Study Area



Several surveys undertaken in the last 20 years have reported no sites. These surveys have generally been carried out as development assessments over small areas.

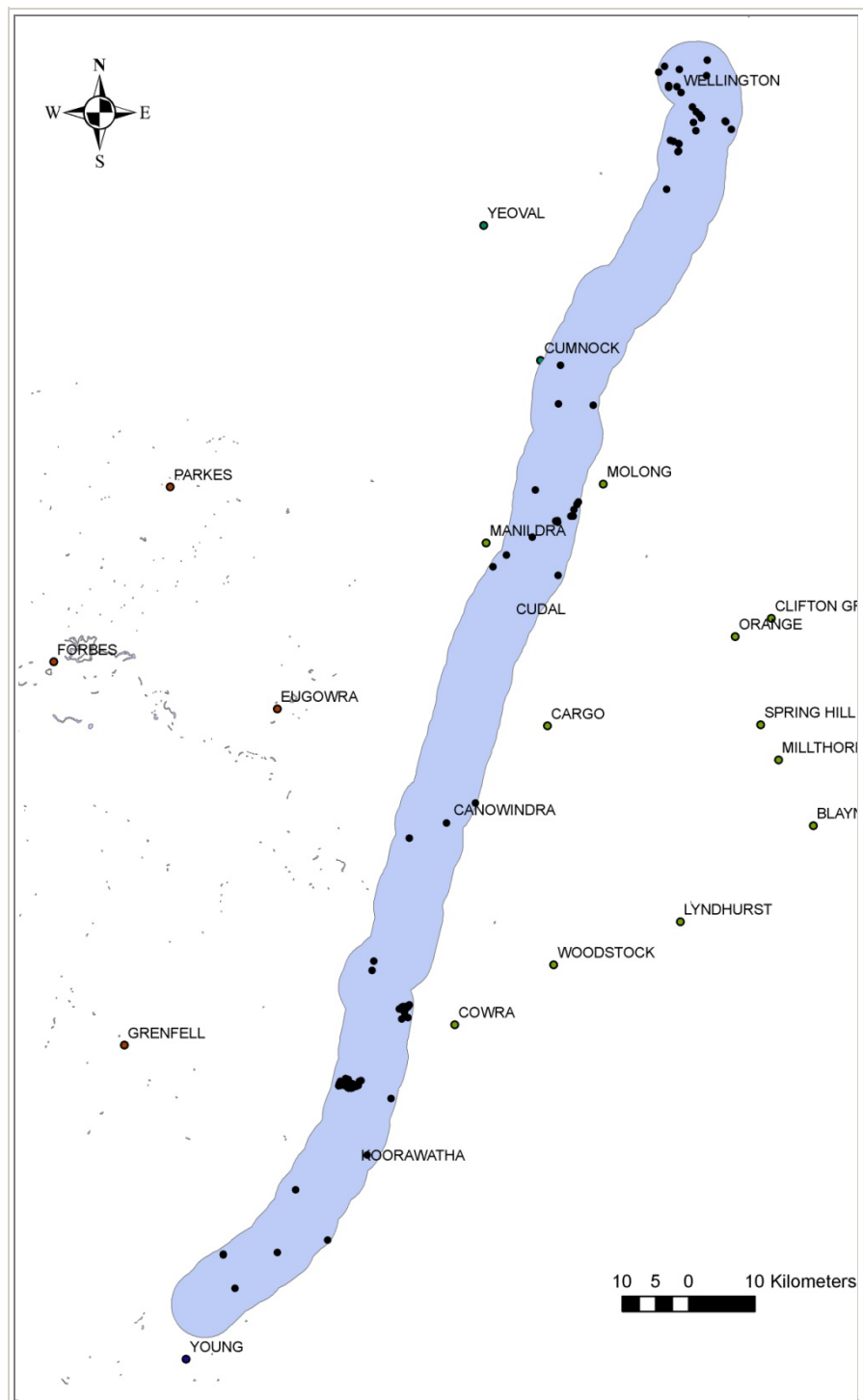
7.2 Previously Registered Sites (on the AHIMS Register)

The DECCW register of cultural heritage places contains 129 sites within 3 km of the proposed pipeline (Figure 20, Table 6, Appendix 1). The closest site is more than 200 m from the proposed alignment. The greater proportion of these sites is culturally modified trees, together with stone artefacts [either isolated objects or stone artefact concentrations] accounting for most sites [83%].

Table 6 Number and Percentage of Registered Sites in the Study Area

Site Type	%	n
Modified Tree (Carved or Scarred)	51	65
stone artefact [isolated object]	25	32
stone artefact concentration	7	9
Grinding Groove	6	7
Burial	4	5
Aboriginal Ceremony and Dreaming	3	4
Stone Arrangement	2	2
Habitation Structure	1	1
Ochre Quarry	1	1
Shell	1	1
Totals	100	127

Figure 20 Proposed Pipeline with 3 km Buffer. Sites Registered on AHIMS are Plotted within the Buffer



There are three clusters of sites (Figures 21, 22, 23) near Wellington, Molong and Cowra.

Figure 21 Sites Registered on AHIMS near Wellington

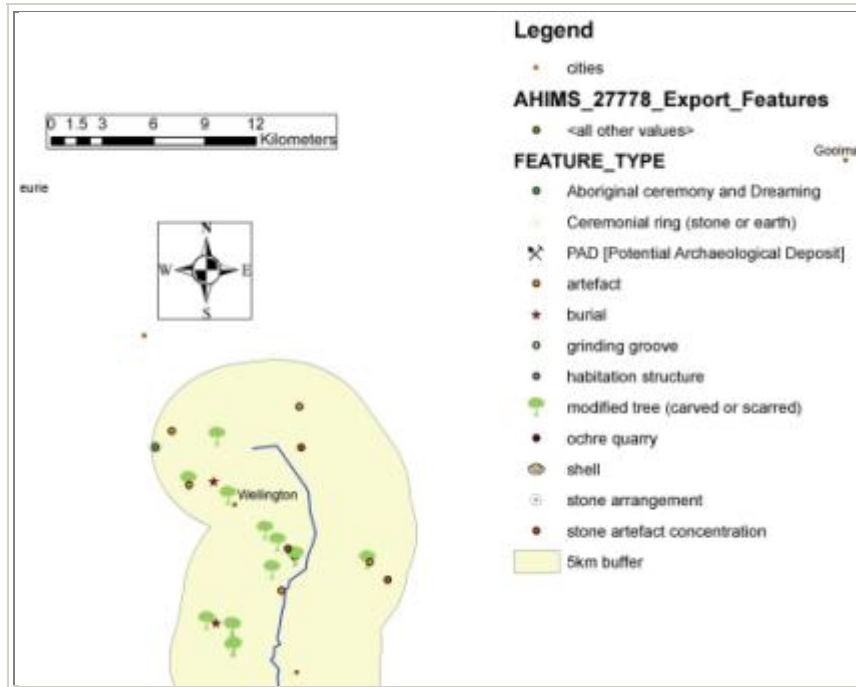


Figure 22 Sites Registered on AHIMS near Molong

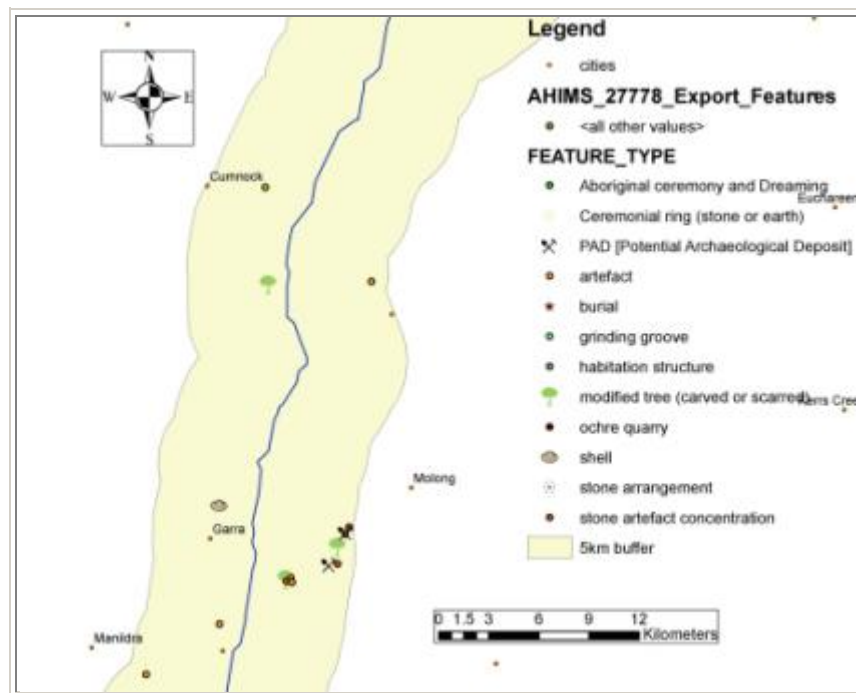
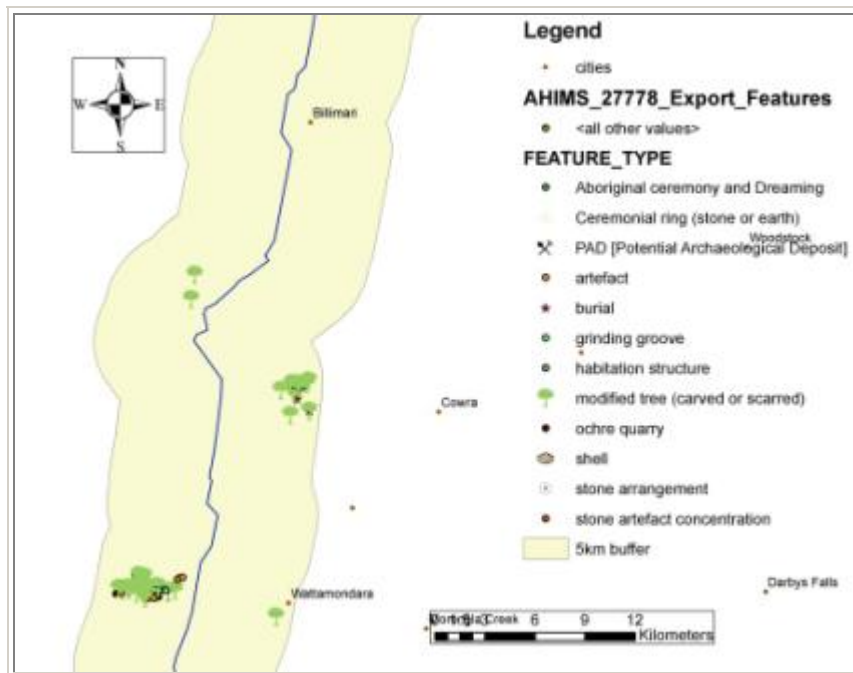


Figure 23 Sites Registered on AHIMS near Cowra



7.3 The Register of the National Estate

The Register of the National Estate was searched for relevant sites or places on the four LGA Regional and Local Environmental Plans and the Archaeological zoning Plan. The Wellington LEP contains one listing of an Aboriginal place, New Oakleigh Carved Trees, approximately 16 km southwest of Wellington.

The New Oakleigh Carved Tree Site retains two dead but in situ carved trees at what was originally recorded as the site of four carved trees. Trees such as this are rapidly deteriorating and are an endangered site type. A mound, believed to be a burial place, is located between the two remaining trees. Although ethnographic records refer to the association of carved trees with either a Bora Ground or burial place, it is rare to find that association intact (Criterion B.2).

Date Significance Updated: 29 Jun 98

The site was originally recorded as containing four carved trees and a mound grave. Two of the trees are still at the site, both are dead and one has fallen over. The third tree is in the local Wellington Museum and the fourth has apparently been destroyed.

This site is more than 18 km from the proposed alignment and is not within the Study Area. The site will not be impacted.

8 Expected Archaeological Evidence in the Study Area

Previous studies provide evidence of the type and location of sites to be expected in the region. The proposed pipeline runs very nearly on the ecotone between the slopes and the plains. Although it might seem that patterns of site type and distribution might change systematically over long distances from the Alpine region to the interior plains of the Murray – Darling Basin, it is often the case that an abrupt shift takes place and the ecological character of the country has quickly moved from one state to another. This would affect the type and location of sites in many ways.

Ecological variation may be characterised by the number and variety of micro-environments available within a given area. Such indicators of site patterning are common in archaeological work and predictive generalisations (Witter 1992, Bird and Bliege Bird 2005). Microenvironments in the Study Area are generally large in area. People would need to move between them for particular resources. At the same time, however, the Study Area would provide more diversity in environment, since two rather different ecosystems were on either side.

Smaller and more numerous sites might be expected in such a place. Central residences might be expected in the more favourable locations (Pearson 1981, Witter 1992, Navin Officer 1996). These include environmental factors such as:

- Level ground with good drainage.
- Land slightly above the cold air of the valley floors.
- Junctions of several micro-environments with access to water.
- Places with large, if seasonal, food resources.

People were linked across the country by marriage, trade, religion, and other factors. Archaeological evidence of links to the wider region may be found through:

- Rivers linking people culturally and biologically over greater distances.
 - Macquarie and Lachlan Rivers cross the proposed pipeline alignment.
 - Twenty-seven [27] smaller named creeks cross the proposed pipeline alignment, generally trending east to west.
- Evidence for trade. This is generally reduced to stone artefacts in the archaeological record. Trade of string, nets, reeds and wood for spears, skins and other items is documented in historical records, but these objects generally do not survive.
- Dreaming tracks. The evidence for dreaming tracks is restricted in the archaeological record.

The following sections introduce information relevant to the cultural heritage of the study area, more generally to the wider region, and more specifically to proposed development works that may have an impact on Aboriginal cultural heritage on and below the surface.

8.1 Site Types and their Likelihood of Occurrence

Different classes of artefact, feature or site are commonly found in the archaeological record for any given area. Preservation depends on soil characteristics (Section 4), previous disturbance (Section 6), and processes of erosion or aggradation.

Several site types with material evidence may be expected in the study area. These include:

- Culturally modified [scarred] trees.

- Open sites defined by a concentration of lithic items [stone artefacts and debitage, or the by-product of manufacture].
- Grinding materials.
- Isolated lithic objects.
- Grinding grooves.
- Stone and Ochre quarries.
- Burials.
- Earthen Mounds.
- Shell middens.
- Fish weirs.
- Ceremonial grounds.
- Historical sites with which Aboriginal people have an association.

Material evidence depends on local context. As with many of the rivers of the Murray-Darling Basin, evidence of residence consists mainly of stone artefact concentrations and earthen mounds. There may be evidence of ground ovens as well.

Culturally modified trees were very common in forested riverine belts, but their presence today is subject to the amount of clearing and forestry in the particular area.

8.1.1 Culturally Modified Trees (CMT)

In this region, it is useful to separate two broad types of culturally modified tree; trees that have had bark removed and then carved on the heartwood, and trees that have had bark removed or holes cut. The former are typically associated with burials and ceremonial areas, while the latter are typically the result of day-to-day practices obtaining utilitarian items such as bark sheeting, coolamons and canoes. In this document **Carved trees** will be distinguished from **Scarred trees**, except where the kind is not specified.

We sped along the Blacks' track to Pama [Barmah], and thence, keeping on the edge of the fine old red gums (off which we noticed many a canoe had been stripped in old days), to the Moira itself, at the mouth of the Baala Creek. (Curr 1883: 167)

Trees may have bark sheets cut from the trunk. The resulting scarred tree is one kind of use, or cultural modification. Resource extraction holes are small holes chopped through the bark into branches and trunks in search of possums, honey and birds (where the nesting holes may be enlarged by axe). Some scars may give a hint of their function: canoe, bark sheet, coolamon, or 'dinner plate'.

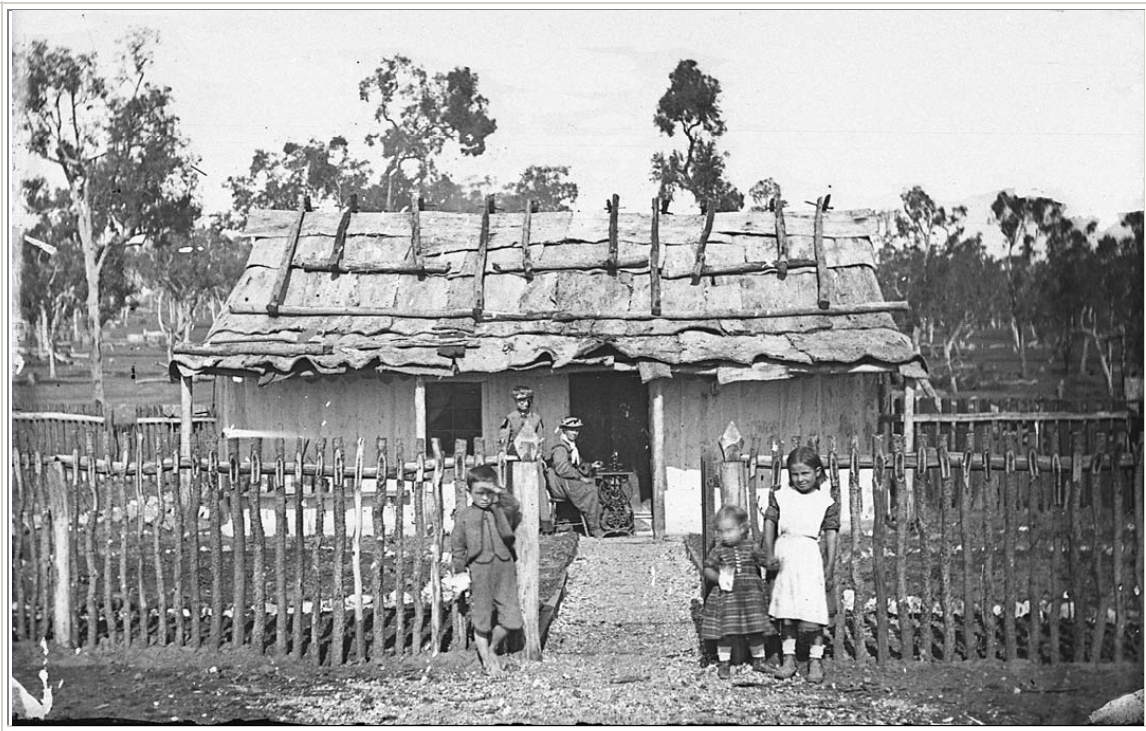
Many culturally modified trees have been registered and many more are to be found, particularly along Travelling Stock Routes, other roads and in forests. Scarred trees form one of the dominant archaeological features in the region.

Culturally modified trees (CMT), or scarred trees, may be found in areas where clearing has not been complete. Notwithstanding the clearing of paddocks, many scarred trees are found on public lands. It is clear however that the remaining CMTs are both few and of young age in comparison to what would have been present prior to 1815. The determination of age and growth patterns of trees large enough to bear scars of bark removal have not been investigated in any detail (Long 2003).

Scarred trees from pre-European times may provide evidence of a range of traditional activities. These include scars from making canoes, coolamons, shields and bowls as well as scars left from resource extraction activities such as possum hunting or honey collection. Large scars are often evidence of the removal of bark sheeting for the construction of windbreaks and housing (Figure 24).

Scarred trees may also relate to the more recent historic period and the early years of European settlement.

Figure 24 Typical Early Settler House in Gulgong NSW with Bark Roof. Note the house with plank walls and bark sheet roof weighted down with logs as well as the treadle sewing machine. Source: Mitchell Library Home and Away Collection PXA 4999, Open Access Collection



As pastoralists moved into the region from the 1820s onward, their dwellings, shops, barns and churches were all originally constructed of slab walls with bark roofing, the typical building materials of the first colonists.

During this period, Aboriginal people and Europeans lived in similar bark roofed dwellings and it would be difficult to distinguish archaeologically between the two. While, in principle, it is possible to tell the difference between stone and metal axe marks on the scars of trees, these are not always visible due to regrowth.

What we do know is that from the 1820s, the provision of bark sheets for roofing became an important source of Aboriginal employment, along with land clearing and shepherding stock. There is clear evidence of a traditional Aboriginal industry adapting to a European economy.

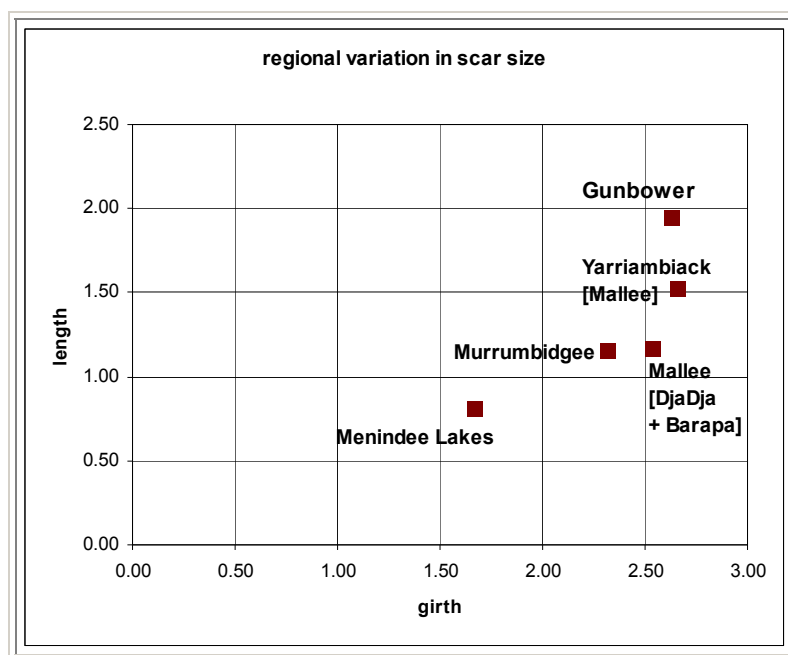
Scars on trees may be formed in many ways (Long 2003). It can be difficult to distinguish between scars made by Aboriginal people traditionally, those made by farmers or foresters and their machinery in more recent times, and natural scarring.

The size of scars can provide an indicator of the uses made of the bark. Large and long scars are usually for canoes, although they may also be used for sheeting for housing (Pardoe 2008). Of 89 scars recorded on the upper Murray River (Gunbower Island, Rhodes 1996), 10 were longer than 3 m, indicating they might have been used for canoes.

Regional variation in the size of scars shows that average length is greatest along the Murray River, less in the Mallee, and least at the Menindee Lakes on the Darling River

(figure 25). This figure also shows that the average size of tree, as measured by girth, is greatest on the Murray River and in the Mallee, less on the Murrumbidgee plain, and least at the Menindee Lakes. The size of scar, then, is dependent on the size of tree – obvious, but a fact that needs to be taken into account when examining differences between regions. The length of scar also relates to purpose. Trees from Yarriambiack Creek in the Mallee and across Dja Dja Wurrung and Barapa Barapa country in the Mallee are as big as those on Gunbower, but there is no need for the longer canoes. The difference between regions, accounting for tree type and size, appears to be the production of canoes, the availability of large trees, and the number of possum holes produced.

Figure 25 Regional Variation in Scar Size shows that Length Predictably Increases with Increasing Girth of Tree



While there is bound to be uncertainty about the original size of the bark sheet on account of regrowth of scars, the size of the scar gives a fair indication of the original minimum size of the bark prised from the tree. Long and narrow pieces greater than 3 m long are generally considered to be for canoes. These are found most often on River Red Gums near main river channels. The smaller, relatively narrow scars between 0.5 m and 2 m are thought to be coolamons, as these were an important item, used to store food, hold goods and babies, and carry water short distances. The bark shields would also fit in this size range, although it is likely that the coolamons were far more common. The greater proportion of scars range in size between coolamons and canoes. These bark sheets are generally wider for their length than the other types and the form of the scar may also be more irregular. The smallest CMTs are resource extraction holes (and occasionally, on account of over-zealous measuring, toe holds).

Small bark sheets were used for any number of purposes. Bark sheets were also used to stretch possum skins.

8.1.2 Stone Artefact Concentrations

Stone artefact concentrations ['open sites'] indicate stone tool activity. From this one may infer various forms of residence. Such inferences are usually based on the size and density of the concentration, and associated culturally modified soils.

Most sites in the area with worked stone are characterised by a heavy reliance on quartz. Many other stone varieties are used [see Section 4]. Most sites consist of fewer than 10 pieces. Most pieces are debitage, or the by-products of manufacture.

Other stone materials consist of silcrete, chert and quartzite. These materials come from the Dividing Range and small ranges in the region.

8.1.3 Grinding Materials and Ground Items

Grinding materials such as dishes, topstones, mortars and pestles, axe sharpening stones, edge ground axes are treated separately for two reasons. First, these items are often the product of much labour to manufacture and continued use over many years. They represent considerable elbow grease and as such form a connection that many Aboriginal people find of importance and emotion. Second, data collection of these objects differs from flaked stone objects.

Grinding stones are commonly used for grinding flour from various seeds, although many other objects may be ground, broken or pounded. Ochre is typically ground and mixed with animal fat; bones may be smashed for marrow.

8.1.4 Grinding Grooves

Wherever there are outcrops of suitable rock, there may be grooves that are the result of grinding. In NSW many of these grooves are considered to be axe-grinding grooves. Some of these are located near the source of suitable stone for axe manufacture (Manna Mountain between Lake Cowal and the Lachlan River, Terramungamine near Dubbo). Other grooves may be the result of seed grinding, and are in a convenient location close to large stands of grass or acacia seeds.

8.1.5 Isolated Objects

Isolated objects refers to any Aboriginal object [defined in the NP&W Act 1974], but in practice generally refers to lithic items. Individual pieces of debitage should not be recorded as isolated objects. The AHIMS site register is database of finite size. It could not contain the hundreds of millions of individual pieces that are present across NSW. Identification of these isolated pieces of debitage as sites devalues the usefulness of the rest of the register, where stone artefact concentrations signify repeated occupation.

Isolated objects are typically edge ground axes, grinding materials, retouched tools, and cores. In areas of widespread erosion and soil loss, whether from ploughing or stock, many items may be seen on the surface, having lost their stratigraphic context.

In order to deal with the background distribution, it is best to set out small sample areas in different micro-environments so that density of materials across the landscape and with reference to stone artefact concentrations may be quantified.

8.1.6 Quarries

Quarries [stone source] are simply the source of stone used for tool making. In this region quarries will be found on the slopes of hills where particular strata are exposed. A quarry includes the location where stone has been taken from gravel beds exposed in streams or as eroded sediments.

Quarries occur on the slopes of the low rocky hills that trend north-south in this region. Aboriginal quarry sites a source of raw materials, primarily for the manufacture of stone tools, but also for ochre procurement. Such sites are often associated with stone tool artefact scatters and stone knapping areas. Exposures of suitable raw material that allowed the creation of quarry sites are known to be present within Goobang National

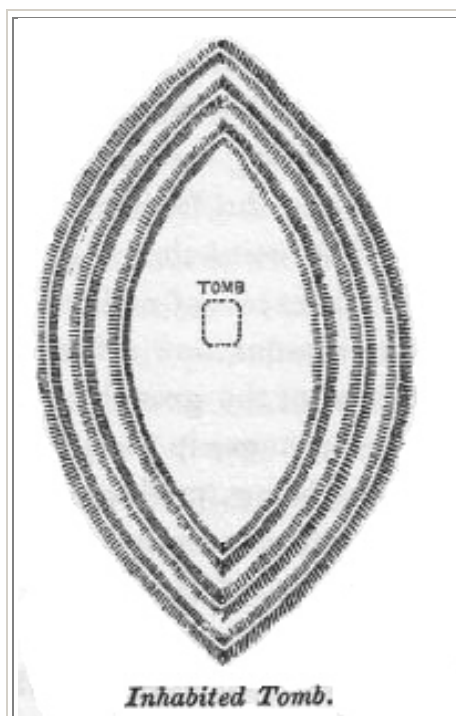
Park from local Aboriginal cultural knowledge. This and the large region covered by the study area, varied landforms, and widespread occurrence of artefact scatters in the vicinity suggests some likelihood of raw material quarries being present within or near the study area. Past research has shown quarries may be present anywhere that suitable raw material and geology are accessible (Pearson 1981). Therefore there is moderate to low likelihood that such sites will be present within the study area.

8.1.7 Burials

On a corner of the plain, just as we approached the land of reedy hollows, I perceived at some distance a large, lonely hut of peculiar construction, and I accordingly rode to examine it. On approaching it I observed that it was closed on every side, the materials consisting of poles and large sheets of bark, and that it stood in the centre of a plot of bare earth of considerable extent, but enclosed by three small ridges, the surface within the area having been made very level and smooth. I had little doubt that this was a tomb but, on looking through a crevice, I perceived that the floor was covered with a bed of rushes which had been recently occupied. On removing a piece of bark and lifting the rushes, I ascertained, on thrusting my sabre into the hollow loose earth under them, that this bed covered a grave.

Tommy Came-first, who was with me, pronounced this to be the work of a white man; but by the time I had finished a sketch of it The Widow had hailed him from the woods and told him that it was a grave, after which I could not prevail on him to approach the spot. I carefully replaced the bark, anxious that no disturbance of the repose of the dead should accompany the prints of the white man's feet. I afterwards learnt from The Widow that the rushes within that solitary tomb were actually the nightly bed of some near relative or friend of the deceased (probably a brother) and that the body was thus watched and attended in the grave through the process of corruption or, as Piper interpreted her account, until no flesh remains on the bones; "and then he yan (i.e. goes) away!" No fire, the constant concomitant of places of shelter, had ever been made within this abode alike of the living and the dead, although remains of several recent fires appeared on the heath outside.

Figure 26 Mitchell's 'PLAN OF AN INHABITED TOMB'



Burial is an important part of society and social life. Occasionally cremation was favoured, particularly for women. The 23,000-year-old cremation of Mungo Lady is the earliest evidence of a ritual that has persisted to the present day.

The study of burials in the region has provided information on where burials might be expected, how these related to residential patterning, and some interpretations of social patterns (Pardoe 1986, 1988, 1990, 1995, Witter et al. 1993, Littleton 1999, 2002, 2007).

Burial Practices

The manner of burial varied with the age and gender of the deceased. There were doubtless many factors influencing how and where a person would be buried, or the remains otherwise dealt with. Historical descriptions of burials are often very detailed, describing how people were buried, what with, nature of the grave and so on. Such descriptions rarely give information concerning social arrangements or religious matters. The invasive nature of ethnographic description is nowhere more noticeable than in the case of funerals. For an archaeological understanding of the nature and distribution of burial as part of the total record left by a group of people, this information gives a partial understanding.

Some forms of mortuary practice may not leave any evidence:

- Exarnation, or the exposure of the corpse to the elements on a raised platform, as was practiced by the Ngarrindjeri at the mouth of the Murray River.
- Cremation was practiced widely along the Murray River and throughout the country. The oldest cremation in the world is recorded from the Willandra Lakes (Mungo Lady, WL1 is dated to more than 20,000 years). Cremation may not leave any evidence, although it is noted in many cemeteries of the Murray River (Pardoe 1993).
- Tree burials were probably fairly common (Richards et al. 2004). Widespread tree clearance means that the likelihood of finding one is fairly low.

Cemeteries

Cemeteries are found in the Murray – Darling Basin, but have rarely been documented elsewhere. Cemeteries have been defined in an archaeological context along the Murray River using four criteria of number of burials, density, exclusivity of use and boundedness (Pardoe 1988). Further investigation of cemeteries and burials in the Riverine Plain and Murray River floodplain (Pardoe, Littleton 1999, 2002) indicates that cemeteries are distributed close to large residential areas.

No cemeteries have been documented in the study region.

Location of Burials

People were buried in many places. It was common to bury people ‘on the spot’. Over thousands of years, this has resulted in a pattern of the greatest density of burials being found in the areas of greatest density of occupation.

Burials may be found in sand bodies such as source bordering dunes near rivers. The density of burials in these features is typically extremely low, being on the order of 1 burial every 1.6 km of dune (Pardoe 2000, 2003). Burials are exceptionally rare in other land forms.

Five [5] burials have been documented in the study area. These are not within the proposed works corridor.

8.1.8 Earthen Mounds and Ground Ovens

Mounds are one of the most common archaeological features of rivers of southeastern Australia. They are visible as circular to oval rises, usually with vegetation that differs from the surrounding area. Mound soils are different in composition, texture and content. The soil is usually unconsolidated or looser, with a greater proportion of organic material, including ash, charcoal and residues from cooking. The soil of many mounds is much darker than the surrounding soil, and also much stickier.

Mounds may contain many of the expectable by-products of habitation including food debris, tools both worn out and lost, and most commonly baked clay heat retainers. Burials are occasionally found in mounds. This is to be expected and has been documented both historically and in more recent observation.

Identification

From a distance, it is usually easy to identify a mound. Mounds are raised areas measuring 10 m to 20 m in diameter, although they may be much larger and occasionally smaller. Since most mounds are found on low floodplain country, they are readily identifiable. In places where soil has been accumulating through natural processes, such as on riverine fans, mounds may build in concert with the surrounding soil. Although they would record the same evidence of residence, and are built by the same processes, the two forms may not be recorded together. In some investigations, a more general term such as 'cultural deposit' may be used (Craib 1991, Pardoe and Martin 2003).

Natural processes may form mounds. Large trees build a collar of soil and humus around their base. If a large part of the trunk remains upright after the tree dies, the rotting wood and termite nest material inside will add to the original mounded area, producing a small mound consisting of humus and termite nest, which may bear some resemblance to soil produced by earth ovens.

Many trees burn. The fire will follow the roots underground, leaving charcoal and baked soil behind. These materials may appear to be an oven. It is possible to distinguish the two by the larger chunks of charcoal and the shape of the baked clay. Some pieces will be smooth, having been against a piece of tree root, but most will be crumbly and not consistent with baked clay balls.

Mound size is typically measured by greatest and least diameters and height. Area and volume may be estimated from these figures. Area has been estimated for all the comparative data using the equation for area of an oval, or ellipse:

$$\text{Area} = \pi \left(\frac{1}{2} \text{major axis} * \frac{1}{2} \text{minor axis} \right)$$

The size of mounds varies considerably. At the Macquarie Marshes mounds are nearly circular. Diameters measure from 3.3 m to 70 m and range in height from a few centimetres up to 0.8 m.

The size of mounds varies by region (table 7). The mounds of the Macquarie Marshes are smaller than those of the Murray River floodplains (Gunbower and Wakool). Mounds of the Hay Plains to the west are among the largest in the continent (Summary data from Pardoe 2008 [Gunbower Island, Rhodes 1996; Wakool, Berryman and Frankel 1984; Hay Plain, Pardoe and Martin 2001]).

Table 7 Average Size of Mounds Varies by Region

Region	Length	Width	Height	Area
Gunbower Island	11.7	10.1	0.2	98.9
Wakool	18.2	15.8	0.3	246.5
Hay Plain	25.5	22.3	0.3	680.1
Macquarie Marshes	13.7	11.2	0.4	157.4
All Groups	17.2	13.9	0.3	247.2

Mound Contents

Cultural material found in mounds is variable. Baked clay heat retainers and their crumbled by-product forms a substantial amount of mound deposit, and contribute to the high alkalinity of the site. Ash and charcoal is present, sometimes making up the bulk of the deposit. Burnt and fragmented faunal remains are common, and include a wide range of species from aquatic environments (Martin 1999). Microblades, bone points, ground edge axes and some grinding equipment may be found.

Function of Mounds

Mounds would have been lived on, cooked in, used as refuse areas and so on. When formation processes and site contents are examined, mounds may be classed into different types (Klaver 1998: 64-5). These include oven mounds, ash dumps, dwelling platforms, garden mounds, burial mounds, and those of non-cultural origin.

In Australia, the majority of mounds appear to derive from the operation of earth ovens, as they are made up of burnt materials such as ash, charcoal and baked clay heat retainers.

Location of Mounds

Earthen mounds have been recorded to the north of the study area at the Macquarie Marshes (Balme and Beck 1996) and to the west in the Hay Plains (Pardoe and Martin 2001) and south and west in the major floodplains of the Riverine Plain, including the Murray, Murrumbidgee and Lachlan, Wakool, Edwards Rivers and the other major channels.

Mounds are most commonly found along floodplain creeks among River Red Gum and Black Box forests. They are located on levees, margins of lagoons, billabongs and swamps, and on the floodplain margin marked by the first break in slope above the floodplain (Pardoe 2008).

Relation of Mounds to Other Site Types

Hearths, ovens and mounds are related site types and are recorded separately in the sites registers of both Victoria and New South Wales. These features are abundant and obvious in the archaeological record of many areas within the Murray – Darling Basin. It should be recognized, however, that these sites form a gradation of features. While there are consistent and visible differences between them, they all result from the same action – burning a fire, usually for cooking.

Occasionally, aggrading landscapes will build up in concert with mound development and it becomes a moot point to decide that one is a mound, built up above ground, while the other is a midden, lying in the ground.

Mounds were continually dug over as each day's oven was used. That is why stratigraphic investigation is notoriously difficult.

Mounds are fairly recent in the long-term history of Australia, generally dating to the last few thousand years.

8.1.9 Hearths

Hearths are surface features, although they may subsequently become buried. They are not dug into the ground. Hearths do not normally have heat retainers. Burnt clay should be inspected to determine if it is the result of in situ burning or purposeful use as heat retainer. In all cases though, hearths are smaller than ovens.

8.1.10 Ground Ovens

An oven is a hole dug into the ground in which a fire is lit, clay heat retainers added and food cooked. An oven often will have had its heat retainers raked out, either for re-use or when the food is taken out. Ovens are generally larger than hearths, incorporating evidence of many heat retainers, either scattered on erosion surfaces or clumped in situ, with ashy deposit. Ovens differ from hearths in being deeper. They have been dug into the ground for cooking food in the ground. This is why so many are found in sandier deposits. An eroded oven should be larger than a hearth.

With continued use in a particular area, mounds develop from ovens. That is, mounds are the result of many ovens being dug and cooked in. Over time clay heat retainers, ash, charcoal and food remnants build up to produce the mound.

8.1.11 Shell Middens

Shell middens are made almost entirely of mussel shells, although they may be part of larger residential deposits. They vary in size from a few scattered shells to large beds of shell. These deposits may contain stone artefacts, hearths, animal bones, other organic material, and burials.

8.1.12 Recent Historic or Contact Sites

Archaeological evidence of Aboriginal life from the contact period of the 1800s has been documented in the region (Section 6). Information from this time may come from oral history, historical records, analysis of scarred trees (Pardoe et al. 2008, Long 2003), and other sites with material evidence.

8.2 Site Types Unlikely to be encountered in the Study Area

Some site types are less likely to be encountered in the Study Area. Field survey methods do not ignore such site types, and during the survey, any relevant landform or environment will be examined.

8.2.1 Rock shelters

The proposed alignment does not cross ranges high enough to contain rock shelters.

8.2.2 Rock Art

Rock art will be found in rock shelters, hence this feature is unlikely to be observed.

8.2.3 Stone Arrangements and Earth Circles

Stone arrangements have been located in the region, typically on high ground. It is not likely that the Study Area would encounter such terrain, but any areas of loose surface rock will be examined.

Earth circles are fragile entities. Although the Bora ground is often large and formed from several parts, the sweep of one plough would be enough to destroy such features.

8.3 Site Distribution

Distance to water is a major determinant of sites. Most sites in drier areas are to be found close to water sources. In a study of the Riverine Plain centred on the town of Hay, the distribution of all site types was clustered, with approximately 80% of all sites within 300 m of some source of water (figure 27; Pardoe and Martin 2001). In a study at Lake Cowal, approximately 100 km to the west of the Study Area, the distribution of lithic items was highly clustered, with virtually all objects within 1,000 m of a water source other than the lake itself (figure 28; Pardoe 2009).

Figure 27 Distance of sites from water in the Murrumbidgee Plains to the west of the study area (Pardoe and Martin 2001)

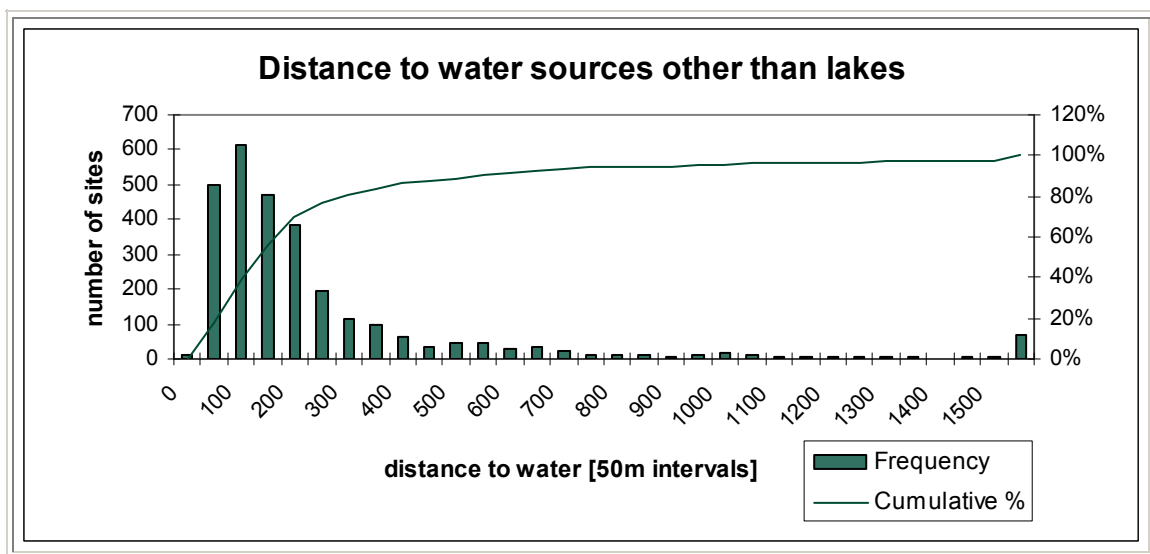


Figure 28 Distance of sites from water at Lake Cowal, approximately 100 km to the west of the study area (Pardoe 2009)

