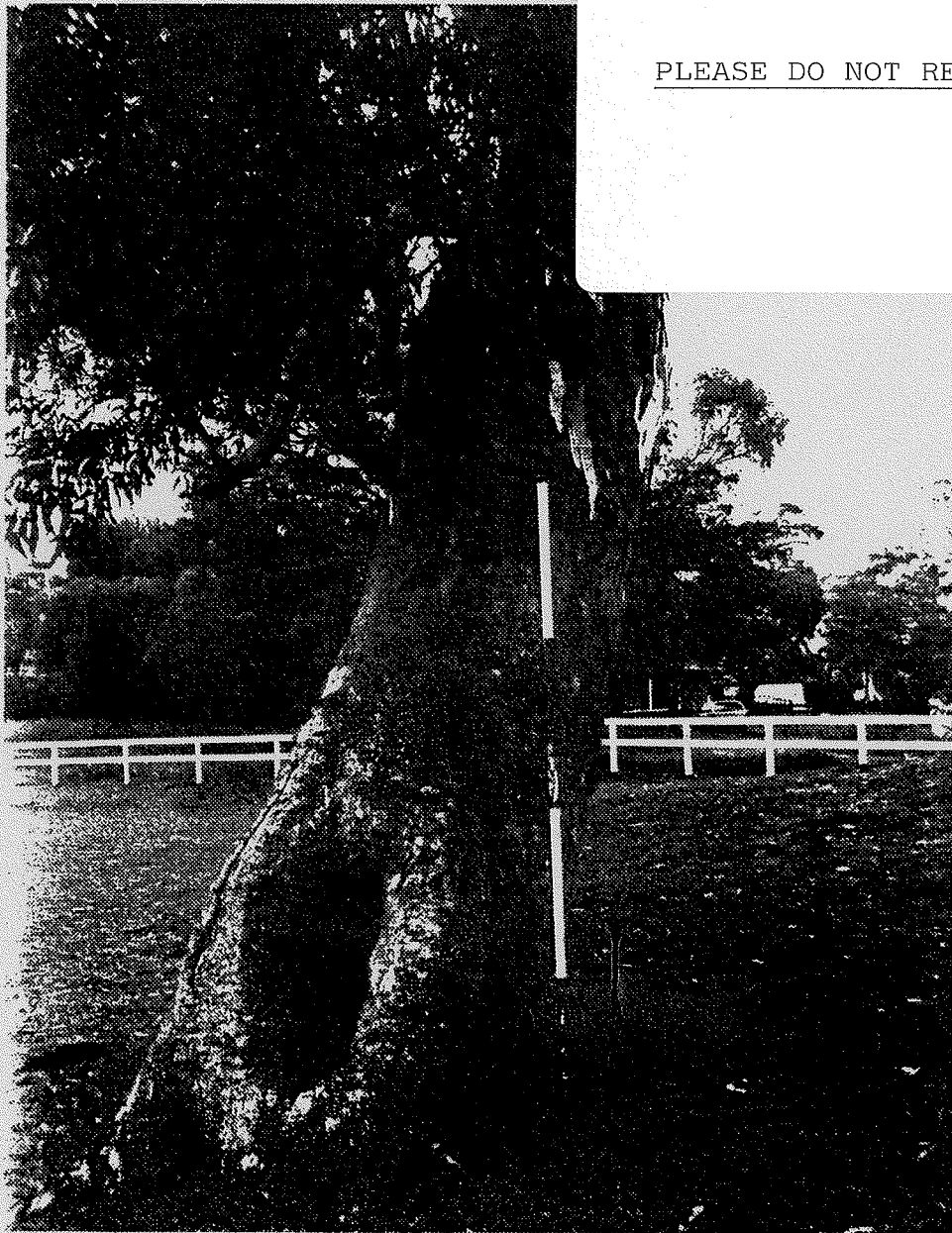


THE PLENTY VALLEY CORRIDOR

The Archaeological Survey of Aboriginal sites

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Isabel Ellender
1989



VICTORIA
ARCHAEOLOGICAL
SURVEY



Ministry for
Planning and
Environment
Victoria

THE PLENTY VALLEY CORRIDOR

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of
Aboriginal sites**

For The Ministry for Planning & Environment

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THE PLENTY VALLEY CORRIDOR: THE ARCHAEOLOGICAL SURVEY OF ABORIGINAL SITES

1. INTRODUCTION

The Victorian Government has identified the Plenty Valley as a corridor for urban expansion. The Ministry for Planning and Environment has commissioned a number of planning and resource studies in order to evaluate the impact of the development on the region. One of these studies is an assessment of the cultural heritage of the Valley - both Aboriginal and historical.

This report is the study of Aboriginal sites identified in the study area. These sites are protected under the Archaeological and Aboriginal Relics Preservation Act 1972 and the Aboriginal and Torres Straits Islander Heritage Protection Act 1984. The historical archaeology is covered in a separate report (Weaver 1989) and a European Heritage Study of the Whittlesea Shire will be conducted by the Shire and the Heritage Branch of M.P.E. in 1989.

1.1 Objectives

The objectives of the Aboriginal sites component of the archaeological study are:

1. To identify areas of high archaeological potential in the corridor.
2. To indicate the implications of these archaeological values for development of the corridor.
3. To consult with Aboriginal people with interest in the corridor zone to identify their views regarding the Aboriginal cultural heritage of the area.

1.2 Sponsorship

The Ministry for Planning and Environment has funded a cultural heritage study which consists of a team of four people - two archaeologists, an historian and an Aboriginal liaison officer. The study was funded to run for 5 months from September 1988 to January 1989.

1.3 The Team

Paul Hicks was engaged as the historian and was responsible for the historical research and the literary search of the ethnohistorical documents.

Isabel Ellender and Fiona Weaver were the two archaeologists who were responsible for the archaeological survey of Aboriginal and historical sites; Isabel Ellender primarily for the former and Fiona Weaver for the latter.

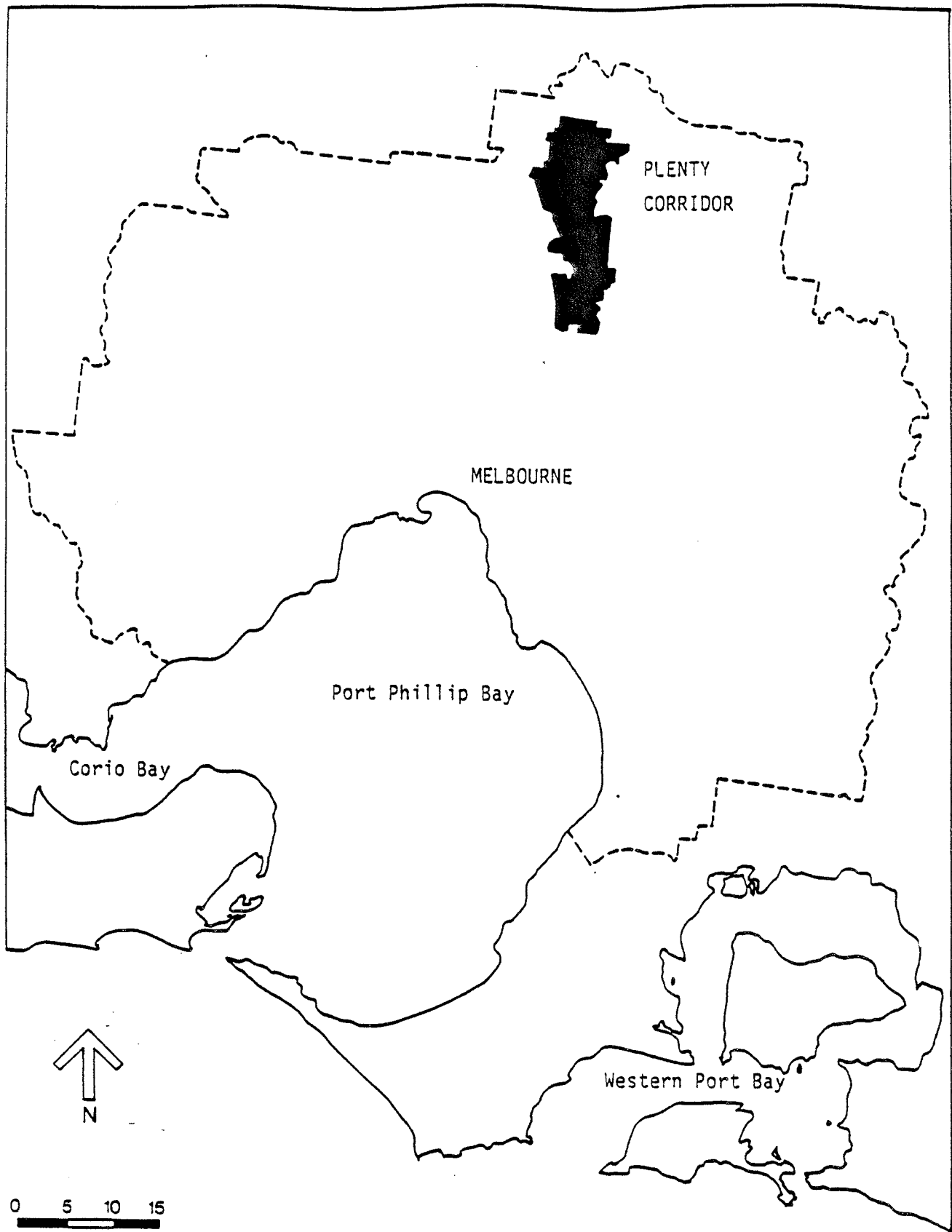
During the field work, Grant Desmond and Alan Wandin were employed as liaison officers for the Wurundjeri Community working at different times to identify and record Aboriginal sites. The Wurundjeri Tribe Land Compensation and Cultural Heritage Council represents the Aboriginal Community responsible for the study area.

The team members were employed as exempt employees of the Victoria Archaeological Survey. The VAS was thus the manager of activities and supplier of administrative and logistic support. The study was devised by VAS, the Aboriginal Affairs Unit and the Heritage Branch of the Ministry of Planning and Environment, who jointly supervised the project.

The project was initiated with the historical research which commenced in early September 1988 and became the background to the work by the rest of the term. Field work was conducted by the archaeologists and Aboriginal community representatives for 26 working days between 31st October and 8th December 1988.

1.4 The Study Area

The area of the corridor is, as implied, a long, relatively narrow and irregular, rectangle extending north from Greensborough to the slopes of Mt. Disappointment, north of Whittlesea. Its eastern boundary is Yan Yean Road and its western boundary runs irregularly well east of Epping Road. The region is roughly the catchment and valley of the Plenty River. (See map 1).



----- Metropolitan Planning Boundary

Map 1: Location of the Plenty Corridor

2. ENVIRONMENT

2.1 Introduction

It is important to have some understanding of the pre-contact and present environmental conditions of the Plenty Valley, - for two main reasons.

- a) The distribution and availability of resources to the pre-European population had an important bearing on their adaptation and the change in patterns of occupation over time. Food and raw materials may have been available on a seasonal basis or as a result of other environmental factors such as wet years and dry years, fires and floods. Knowing the distribution of resources such as certain plants, flakeable rock and permanent fresh water provides clues for the locating, assessment and interpretation of archaeological sites.
- b) Secondly, the understanding of the environmental processes that cause changes over time provide insight into where sites can be found and how the preservation and exposure of archaeological sites has been affected. For instance, the pattern of flooding greatly influences the distribution of sites near the Plenty River, - not just because it affects the decisions people make about where to camp, but also because flooding can leave a covering of sediment on archaeological sites or scour them away.

Environmental information discussed below is derived from the two studies - The Plenty River Basin Study (MMBW 1976) and the Yarrambat Metropolitan Park Study (Meldrum Burrows and Partners 1976).

The Plenty River lies in a large eroded basin created by the action of the Plenty and Yarra Rivers and the Diamond, Darebin and Merri Creeks. These rivers have cut into old sand and mud stones. The Plenty River now flows through a partly eroded and partly depositional landscape of mostly flat floodplain. A number of processes which have happened over the last 150 years of European occupation of the Valley have caused considerable alterations to the pre-existing conditions. Aspects of the environment in terms of pre-European and post-European contact are examined here.

2.2 Climate

Meteorological stations at Yan Yean, Greensborough and Preston indicate that the study area has an annual rainfall of 630mm mostly from September to November. January and February are the driest months.

December and January are the warmest months and July the coolest, with temperatures a little lower than most of Melbourne.

Winds from the north predominate in winter and south or southwesterlies in summer. The flat plains are now very exposed to wind though denser woodlands before clearance would have been ample windbreaks.

2.3 Geology

The study area is conveniently divided into three major geological zones (see map 2).

1. The bedrock of Silurian to lower Devonian silt and sand stones with minor limestone lenses and conglomerate beds underlie the Valley and are intruded into by upper Devonian granites such as near South Morang. Tectonic movements have caused folding of these sediments and 340 million years of weathering, - their erosion. These sediments are seen as the folded and dissected hills and slopes of the eastern side of the corridor and can be observed in sections of the Plenty Gorge.
2. During the later stages of the Tertiary Period massive flows of the Newer Volcanics basalt covered the western plains of Victoria.

The basalt filled valleys and formed 'tongues' which hardened to form the formations known as stony rises. During the easterly flow of the basalt, the Plenty River Valley was infilled and the river was shifted as a lateral stream to its new and present course. The result is that part of the western half of the corridor area is underlain by basalt.

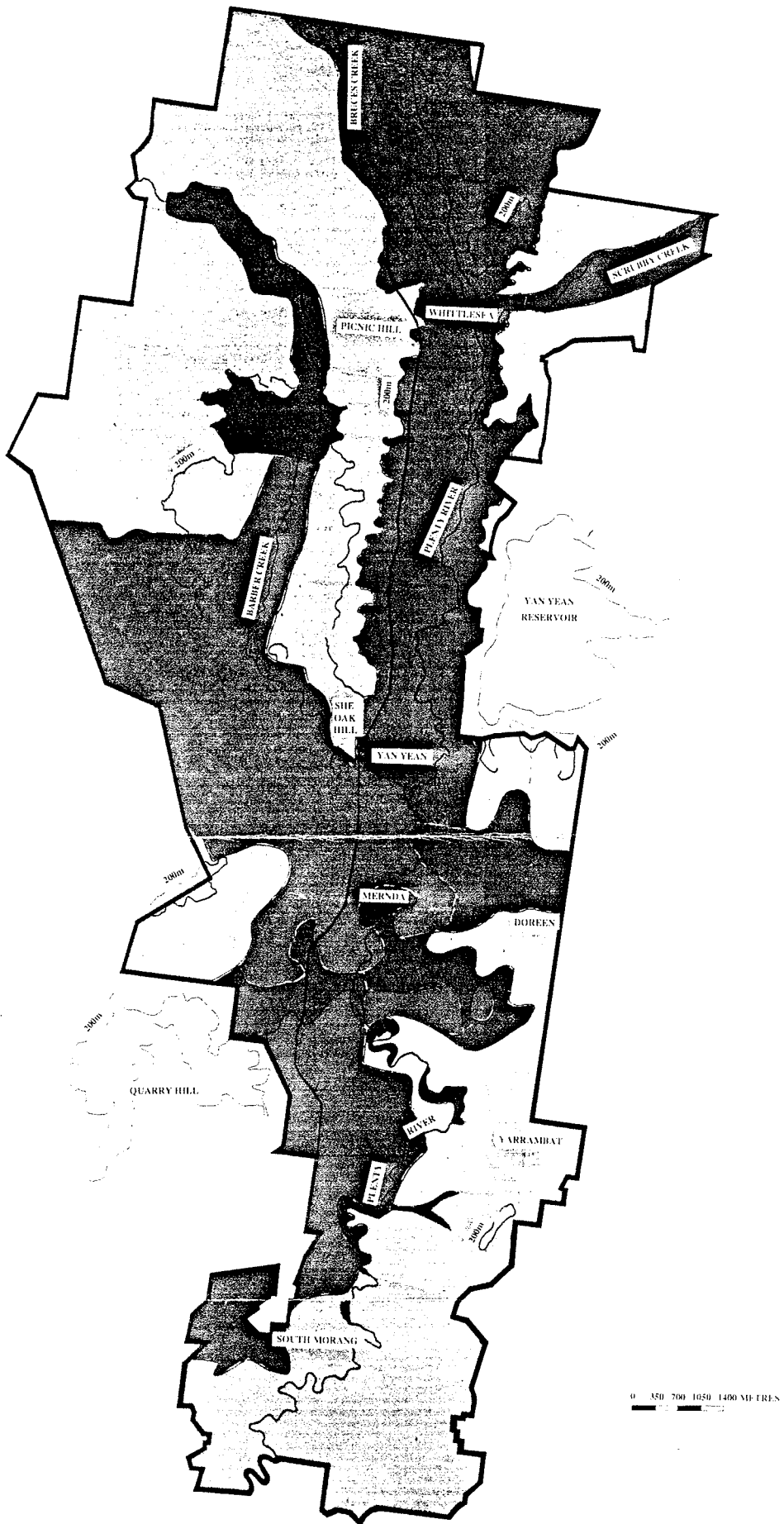
3. During the Quarternary Period, the Plenty River and its tributaries have continued to erode and deposit material in the catchment. Deposition of clays, sands and gravel has occurred in the floodplain north of Whittlesea and finer alluvium, muds and sands between Whittlesea and Yan Yean. In the Gorge, the Plenty has actively incised into other deposits and Quarternary sediments are meagre.

2.4 Hydrology

The study area covers most of the catchment of the Plenty River. At Whittlesea, three tributaries combine to form the Plenty - Bruce's Creek from the west, Scrubby Creek from the east and the Plenty River from Mt. Disappointment to the north. The Plenty has formed a broad mature valley upstream of Mernda and originally flowed to the south west along the course of the Darebin Creek to the Yarra. Barber's Creek, its only other major tributary, joins the Plenty at Mernda.

About a million years ago, the new Volcanics basalt flowing from the west, filled and blocked the Plenty Valley near the confluence with Barber's Creek north of Mernda. The river was deflected east to its present course in which it is still incising, mostly along the junction of the basalt and the Silurian sediments.

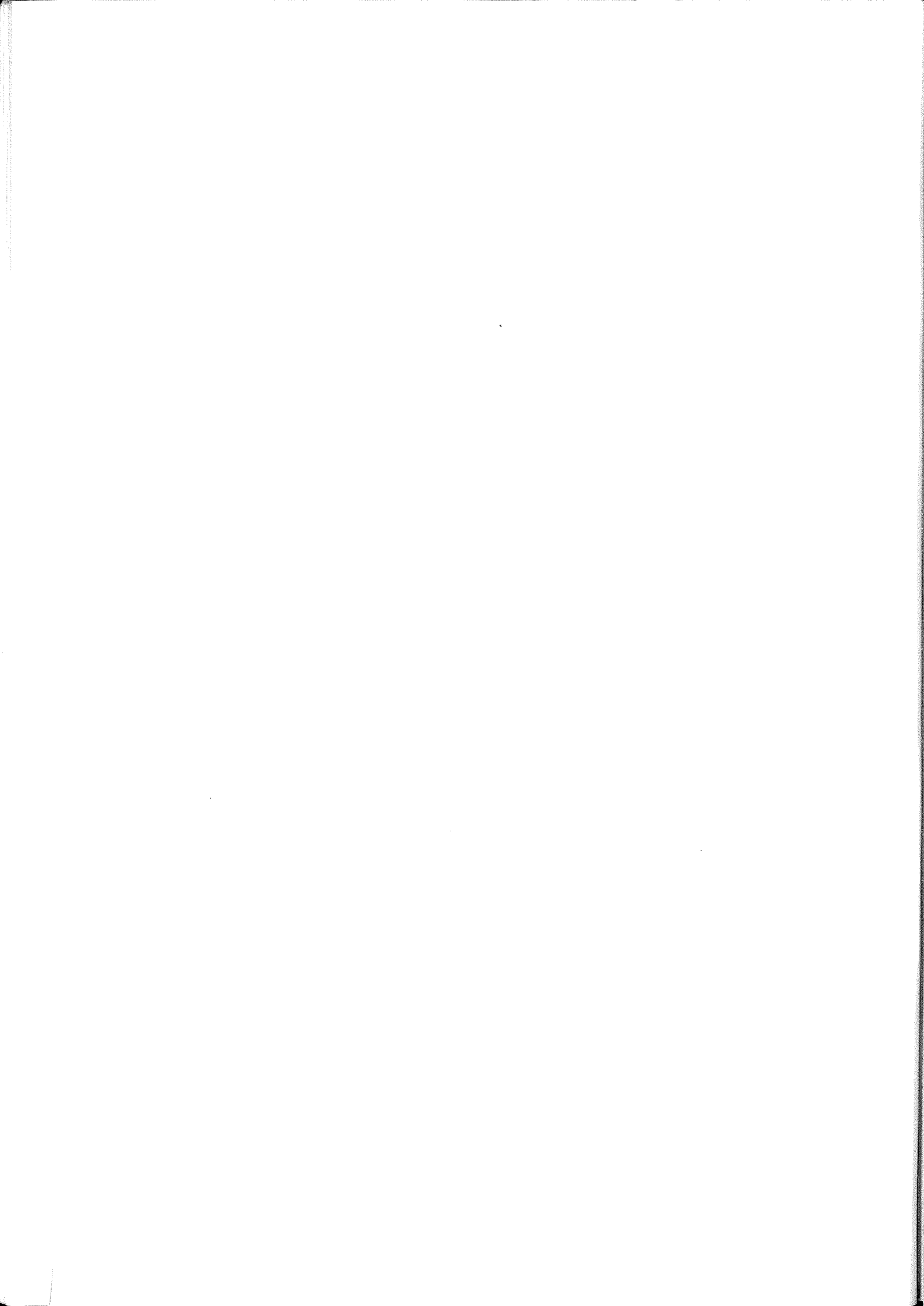
The southwest facing slopes of the Great Dividing Range form the northern edge or the large Plenty River catchment. They are the first in the path of the rain bearing south westerly winds to precipitate the rain. The depth and continued erosion of the Plenty Gorge are evidence of its volume and load. The extensive alluvial flats are the result of a long standing regime of flooding. Before the Yan Yean reservoir was built in 1853-57, the extensive pre-existing Ryder's Swamp had been drained. An old survey map in the MMBW archives illustrates the even surface which varied only within 2 inches (5cm) over most of the drained paddock surface. Water from the Plenty system was diverted into the reservoir and the volume downstream was thereby much reduced.



GEOLOGY

- NEWER VOLCANIC BASALT
- SILURIAN BEDDED SAND STONES, MUDSTONES AND SHALES
- QUATERNARY GRAVEL SAND SILT AND SWAMP DEPOSITS

MAP 2 GEOLOGY OF THE PLENTY CORRIDOR



Today, the Plenty still has a reduced flow but is prone to flooding. During this process there is both aggradation in the form of silt deposition, and also erosion of the channels and banks. Plates 1 and 2 give some indication of the extent of the flooding during the period the field work for this study was conducted (November 1988).

Aggradation is occurring in the wide floodplains north and south of Whittlesea where the river is slow, meandering and shallow. This occurs mainly during floods and there are pockets of swampy ground in this section.

Barber's Creek drains a substantial (55km²) catchment between the Plenty and Darebin Creek. It has the flat floodplain of a mature stream though it has sections of gully erosion and swamps.

2.5 Vegetation

The Plenty River Basin Study (MMBW 1976) indentifies four major vegetation zones within the present corridor study area:-

1. Mixed Woodland

This is found surrounding the Yan Yean Reservoir and overlaps the eastern margin of the corridor.

2. Open Forest

Two small areas survive on the Gorge edges between South Morang and Greensborough and at the Yarrambat Park.

3. Riparian

A mostly undisturbed association of water-loving plants inhabit the area 10 - 20m on either side of natural water courses

4. Grassland

Most of the valley is under grass - either unimproved or improved pasture. The flat areas have a scatter of Red Gums (Eucalyptus camaldulensis) of variable density, mostly confined to the basalt.

(See Appendix 3). (Note the Red Gum should be added to this list).

The vegetation regime seen today is significantly different to what it was before European settlement of the Valley. The two major impacts on the native vegetation have been:

1. The creation of the Yan Yean Reservoir.
2. The clearance of the land for agriculture and settlement.

Before these impacts, all woodland areas would have had a denser tree population - the Red Gum plain being more like that seen around Mernda today. There is a strong tendency for the Manna Gum (*Eucalyptus viminalis*) to be the dominant tree species on the Silurian sandstones and for the river Red Gum (*Eucalyptus camadulensis*) to dominate the basalt plains.

The Manna Gum woodland frequently has an understorey of scrubby plants which was probably typical of the unmodified forested state such as that seen adjacent to the Plenty River and especially in the Gorge.

The slightly denser growth of Red Gums would also have had an undergrowth of young saplings and other species including grasses and yam daisy (*Microseris scapigera*).

With the European settlement of the valley came the clearance of trees. The purpose of this was to open the land up for pasture and cultivation, to satisfy the need for timber for construction work and to control bush fires. Cultivation and grazing eliminated the native shrubs and species such as the yam daisy, and exotic grasses pushed out many of the native grasses. According to historical sources, the hills to the west and south of Whittlesea were covered with She Oak and Banksia trees, but those have been cleared for grazing purposes (Cameron Beardsell pers. comm). The name She Oak Hill is a reminder of this.

The creation of the Yan Yean Reservoir caused considerable impact on the vegetation in that it curtailed some major flooding and reduced the water flow of the Plenty River. This in turn has reduced the replenishing effects of the alluvial deposition on the floodplain and together with artificial drainage of wet areas, has caused the drying up of some parts. Grasslands have therefore been encouraged by clearance and drainage and maintained by grazing stock.

2.6 Fauna

Today much of the corridor is cleared for agriculture. Previously, the forests would have supported populations of wallaby, echidnas, gliders, possums, rodents, bats, reptiles and numerous birds. The Red Gum plains would have been the habitat of parrots, wallabies, grey kangaroos, and brushtail possums.

The swampy sections especially Ryder's Swamp which occupied the site of the Yan Yean Reservoir would have been teeming with wetland species. The river and creeks supported fish, eels and fresh water molluscs. Long time residents remember platypus in the Plenty.

2.7 Environment as Resources

The pre-contact Aborigines of the study area were hunters and gatherers and were adapted to their environment in a way that enabled an efficient exploitation of the available resources.

Southeast Australia has enjoyed a climate that is most amenable to human populations mostly because it supplies a reliable rainfall and abundant food resources. It is believed that substantial numbers of Aboriginal people occupied Victoria and that there were times and places where food resources were so abundant that there was enough for large gatherings brought together for ceremonial meetings and semi-permanent camps.

The tools and utensils of hunter gatherers are made from the available materials namely stone, wood, bone, shell, various parts of plants and animals. The geology of the area is reflected to a certain extent in the stone tools found. Within the study area there are rocks suitable for making hammer stones and a number of metamorphosed rocks with good flaking qualities such as quartz, silcrete and chert. The underlying geology also influences the vegetation growing on it. In the study area, the Red Gum appears to prefer the basalt and another suite of species - prefers the sedimentary rocks (see 2.5 above). Thus two very different environments have implications for the exploitation of resources and subsistence patterns. We can expect that they would supply very different foods and materials.

Access to fresh water as well as the food resources associated with it are important criteria in the selection of occupation sites. The Plenty River is a source of permanent water though its tributaries may be less reliable. The regular flooding of the river system would require people to adopt positions sufficiently raised above the floodplain to avoid dampness or inundation at certain times of the year, especially spring. Swampland associated with the river is an important source of plants and animals which contribute to the hunger-gatherer economy. Ryder's Swamp covered probably the best part of 7km² before the Yan Yean Reservoir was constructed. Melaleuca swamplands also existed west and south of the present Yan Yean reservoir. These existed because the Plenty River in flood would back-up water from the entrance of the Gorge south of Mernda and water would breach the threshold into Ryders Swamp (Cameron Beardsell pers.comm.).

Such a substantial habitat would have attracted large numbers of sedentary as well as migratory species and was conveniently surrounded by high ground which served as an excellent vantage for a hunting and gathering people. Ryder's swamp would be replenished with fish and eels when flood water flowed back over the threshold. More marshy ground probably existed north of Whittlesea where three tributaries join the Plenty.

The vegetation of an area has an important influence on what animal species inhabit a region and the strategies people use in hunting. For instance, hunting an emu or kangaroo in open woodland requires different strategies to taking possums from forest trees. The more open woodland would be home to the kangaroo which Aborigines used for food and its sinews and skin were used as string and clothing. In the denser forested areas, small mammals abound.

Plants formed a large part of pre-contact diets. The yam daisy was a common species in open woodland before agricultural practices eliminated it. Typha and Triglochin are wetland species that still grow in parts of the valley (Plate 3). Typha tuber was an important source of food and its fibres were made into string. The bark off trees was used extensively to make receptacles, shields and shelters.

Before European occupation, the moderately fertile soils and rainfall in the Plenty Valley would have supported ample numbers and more varied animals and plants than now.

2.8 Topography and Landscape Units

The environmental information just described can be translated into 'landscape units'. The combination of geology, vegetation, soils, hydrology and topography combine into discrete environmental units which form convenient blocks for studying the patterns of human adaptation to the environment, occupation and land use.

In the Plenty corridor five such units can be distinguished.

1. The hills and uplands.
2. Basalt plains.
3. Sedimentary landscape.
4. Alluvial floodplains.
5. The Plenty Gorge.

(See Map 3)

2.8.1 Hills and Uplands

These are gently rounded modest hills and high ground of over 200m. The largest block is located west of Whittlesea on which Eden Park is built and extends south as two parallel irregular ridges. The west ridge is the long gentle slope of the watershed between the Darebin and Barber's Creeks. The eastern ridge is the fairly abrupt line of hills ending at She Oak Hill northwest of Yan Yean. To the east is the dissected country of Diamond Creek area which forms the eastern edge of the valley from the foothills of the Divide, down the eastern shore of the Yan Yean Reservoir and the hills on which Doreen, Yarrambat and Plenty are perched. Quarry Hill forms an isolated group of igneous hills south west of Mernda and is the watershed between the Plenty River and the Darebin Creek.

The hills unit is mostly Silurian folded sedimentary rocks examples of which can be seen in road cuttings and in the Gorge. These rocks contain veins of quartz. Quarry Hill however, is a Palaeozoic intrusion of granodiorite, quartz diorite and quartz/feldspar porphyry and is just outside the corridor boundary.

Soils are generally duplex silty loam overlying heavier clays of moderate agricultural value and can be very shallow exposing rocky outcrops and can sometimes be sandy.

The Banksia and She Oak vegetation on these hills has been cleared to grassland though pockets exist of Manna Gum, Messmate, Peppermint, various Box Gums with an understorey. Introduced species are gorse, hawthorn and other weeds.

Current use of the hills is grazing, quarrying and where the pockets of woodland occur, these are largely unused.

The hills did not form a very attractive camping place for pre-contact Aborigines. They are windy and steep. However, rocky outcrops may have supplied flakeable rock and the ridges would have formed good vantage points overlooking the valleys.

The landscape unit amounts to 18% of the total study area.

2.8.2 The Basalt Plains

This unit is the area of gently undulating land below the 200m contour with a base rock of basalt.

The basalt plains were formed by the flows of Newer Volcanics Lava which spread from the western plains over the Silurian sediments. A large portion of the western half of the study area to the west bank of the Plenty was constituted in this way. The basalt results in resistant steep banks at the river's edge.

Soils are mostly uniform dark grey, heavy textured clay. The area is often characterised by stony rises and basalt floaters on the paddocks. The imperviousness of the rock and impeded drainage form swampy ground in places.

Typical vegetation is open woodland of Red Gums in a grassland. In many areas the gums have been decimated so that only a scatter of old trees remains or none at all. Grazing effectively eliminates young saplings, though introduced weeds such as Thistle, Gorse and Hawthorn thrive in places. Plate 5 shows a typical view.

For pre-contact Aborigines, the basalt plains would have provided a rather restricted environment. The basalt bed rock and clay soils are so impervious that in winter the woodlands would be marshy and unpleasant and in summer dry and hot. Nevertheless, there were ample food resources to be had and the Red Gum was favoured for its bark which made excellent shields and containers. Basalt floaters have been built into fish traps and houses in the western district (Williams 1985) which could also have happened in the Plenty.

The basalt plains form 26% of the total study area.



MAP 3 LANDSCAPE UNITS OF THE PLENTY CORRIDOR

2.8.3 The Sedimentary Landscape

The sedimentary plain and slopes of Silurian age are those areas of gently undulating land that have not been covered by the New Volcanics basalt. Small areas remain in the valley of Barber's Creek and at Separation settlement west of Mernda. More extensively undulating and dissected sections are present down the eastern and southern borders of the study area.

Soils are duplex gray silty loams over yellow-gray heavy clay with gravel and disintegrating rock pieces. The soil is shallow in places especially on slopes and the bedrock is often exposed. The soil is considered better for agriculture than that on the basalt. Drainage is good due to the perviousness of the rock and the slope of the land.

Vegetation on these dry areas consists of Manna Gum, Messmate, Long Leafed and Yellow Box, Peppermint Gums with a shrubby understorey where there has not been disturbance. In many parts, the trees and shrubs have been cleared for agriculture and orchards and a grassland remains. Plate 4 shows the sedimentary landscape near the Gorge.

The sedimentary landscape would have offered a fairly varied environment to pre-contact Aborigines. In places, the forest was dense and this would have supported numerous small animals. Other parts were more open and flat enough to camp. Plenty of creeks cross this unit with at least semi permanent water. Exposed rocky outcrops offered flakeable material for tools.

The sedimentary landscape units forms 28% of the total study area.

2.8.4 The Alluvial Floodplains

North of Mernda, the Plenty River and its tributary, Barber's Creek, are mature systems which have formed wide, flat plains of deposited alluvium. Flooding of these flat areas has been recorded since 1878. In that year the flood was so bad that it inundated 'parts of the City and Richmond' (Plenty Valley Basin Study 1976:19), destroyed the aqueduct crossing and embankments south of Mernda and caused Melbourne to be without drinking water for three days. The memories of major floods are numerous in the minds of elderly inhabitants of the Valley. The floods were responsible for sweeping away fences, roads and vegetation and of leaving a silty layer on the paddocks.

So the soils of this unit are typically recent, uniform or stratified grey or red-brown clays and silts forming a flat surface. Drainage is often poor.

Vegetation is mostly grassland with pockets of wetlands and a riparian community of Manna Gum, Swamp Gum, Wattles, Paper-barks, Tea Tree and blackberry thickets along the waterways. These thickets often make access to the creeks impossible. Blackberries, Sweet Briar, Gorse, Hawthorn and Boxthorns have been introduced. Plate 6 shows the thick vegetation on this unit.

Current use of this unit is grazing. In the past, there has been extensive cultivation of cereals, potatoes and market gardening, especially around Whittlesea, Yan Yean and Mernda.

The alluvial floodplains, like the basalt in winter would have been a wet environment. But people didn't need to camp here all year round. They could visit periodically (perhaps seasonally) to exploit the abundant wetlands, for animals, birds and the *Melaleuca* for spears. Red Gums, which also grow in these wetter parts, would have been useful for excising bark. Rushes were useful for making string and basket work.

The unit forms 20% of the study area.

2.8.5 The Plenty Gorge

The Gorge is a distinct unit on one section of the river from just south of Mernda to just north of Greensborough. The Gorge has been formed as a result of the river cutting through the relatively less-resistant Silurian sediment after its original course was blocked by the basalt flow.

This active incising has formed a steep sided 76m deep gorge with the Silurian sediments evident on both banks. Those sedimentary strata are often capped or replaced by the basalt. The Gorge has formed into tight bends. A right angle bend at Janefield was created when the Plenty was subjected to river capture. Its course was altered to a southerly direction away from the course of the Darebin Creek. Plate 7 shows the rocky edges of the Gorge at Carome and the Plenty River in flood.

Soils in the Gorge are almost non-existent because of its steepness. However, a few terraces and pockets contain river sediments, and higher up, decomposing Silurian sediments. At the upper edges of the Gorge, the soil can be clayey and sandy with a ferruginous gravel.

Vegetation in the Gorge is probably unaltered for the most part because accessibility is poor. The tall forest with a dense understorey contains Manna Gum, Box Gums, Peppermints, Stringy Barks, Wattles and Tea Tree. Introduced weeds such as the Blackberry have infiltrated the native vegetation and frequently choke the river and fill the concave parts of river meanders. *Typha* was seen growing in pockets adjacent to the river (see Plate 3).

For the purposes of this study, the Gorge will include the steep sided river valley and 200m on either side of the river.

This section makes up 8% of the total study area.

2.9 Implications for the Survey

The inter-relationship of people with their environment is a dynamic one. The ways in which people exploited the environment, and the processes of preservation and erosion that affect site formation all influence the archaeologist's chances of locating sites. Having established what the pre-contact environment had to offer hunting gatherers, it becomes possible to predict where and what kinds of sites may be located.

Thus we may expect the hills to be void of larger campsites but perhaps to have a low to medium density of isolated artefacts. Very few trees remain for opportunities of finding scarred trunks.

The basalt plains, offering on the one hand a rather uncomfortable environment for living, on the other hand important resources. People could circumvent the damp and stony ground by building mounds to camp on. If mounds are located, they can be expected to contain burials and stratified deposits. The basalt floaters could have been utilised to build fish traps, houses and ceremonial stone arrangements. The basalt itself can be used for making tools, and quarries may be found. Experience from the Murray Valley has shown that Red Gums are a favoured tree for the exploitation of bark, and scarred Red Gums can be expected on this unit.

The most amenable terrain for more long term occupation is the sedimentary landscape. The ground is well drained and more creeks (although seasonal) cross the unit. Particularly attractive would be locations close to the other landscape unit boundaries. So, a relatively high density of campsites is predicted as well as the more specialised site types such as scarred trees. Where the sedimentary rocks outcrop there may be signs of the procurement of stone.

In the places where alluvium has been laid down it is unlikely that any sites (other than scarred trees) will be found except in eroded areas even if people used the landscape unit, since the sites will be covered over. There is the possibility that mounds could have been used in this unit to position a campsite off the ground prone to inundation. However, there are many other locations on the drier sedimentary slopes close by that would provide better settings.

Finally, the Gorge offers specific characteristics. We can expect that, as it is today, so the Gorge would have held aesthetic, intriguing, functional and even mystical qualities for the pre-contact Aborigines. A high density of campsites can be predicted for the rim of the gorge. Hall (1987) found this pattern on the Merri Creek.

Most of the Gorge itself is too steep and vegetated for camping, but it did offer opportunities for efficient fish traps and quarries where the basalt caps the sedimentary rocks. Unique in the Plenty Valley is the presence of caves and rock shelters which have been eroded out of the softer strata of sedimentary rocks. Shelters were used by pre-contact Aborigines for occupation, rock art and burials. The presence of unflooded shelters and undisturbed sediments offers great potential for finding these site types.

3. ETHNOHISTORY

3.1 Introduction

Ethnohistorical sources of information on Aboriginal life at the time of contact consist of published and unpublished accounts by early settlers - their impressions, diaries, letters and newspaper articles. In this particular study it is the references to the Aborigines of the region that are of interest. The importance of the accounts is in the information they provide about the nature and location of activities of Aborigines. This information is of importance in the design of the survey strategy.

European settlement caused a dramatic and continuing disruption to the Aboriginal way of life. Today, most Aborigines in Southeast Australia follow a life style which is a combination of European and pre-contact Aboriginal values. This considerably reduces the input of data concerning pre-contact or contact lifeways. The situation therefore puts the onus on what ethnohistorical data there are and the reconstruction of those lifeways by archaeological means. Furthermore, ethnohistorical accounts are limited assets in that they are inevitably biased in many ways. Not least among these biases are the world view of the observer and the responses of the observed. Early recorders included squatters and surveyors who were not well versed in the recording of cultural detail and whose empathy may or may not have lain with the Aborigines. The passing comments in their accounts are few and mostly incomplete. Pastoralists' accounts of the Aborigines may also be muted because they risked the cancellation of their squatters licences if they were proven guilty of homicide, ill-treatment or prostitution of Aborigines in Victoria and New South Wales (Barwick 1984: 109).

From 1839 through the 19th century, the more comprehensive accounts by the Chief Protector and his four Assistants give a much clearer view of Aboriginal life. However, by that time, their traditional lifestyles were already greatly affected by the new European culture.

With these limitations in mind, the records will now be examined.

3.2 The Ethnohistoric Accounts

According to Barwick (1984), who has made an intensive search for anthropological information on the Victorian tribes, the Plenty Valley appears to be part of the territory of the Wurundjeri-Willam, which was a clan of the Woiwurung language group (1984:104). The term "Yarra tribe" was also used for instance by Thomas (Presland 1983:28-29), when probably referring to this clan. The name Wurundjeri is the one retained by the community today. The territory extended from the Divide south to the Yarra and the Dandenongs, west to the Maribyrnong and east to Mt. Baw Baw (1984: 124 & 126). Figure 1 shows the tribal boundaries worked out by Barwick from ethnohistories. To this clan belonged such well-known entities as Jakka Jakka, one of the signatories of the Batman Treaty in 1835, Billibellary, clan headman and custodian of the notable Mount William greenstone quarry near Lancefield which was the hub of an extensive trading network extending across Victoria, New South Wales and South Australia and William Barak, the Woiwurung leader and informant to early ethnographers.

Barwick (1984: 105,106) goes on to point out that clan membership was fixed at birth and a core of men were responsible for their country. The Woiwuring language group practised a marriage system by which individuals had to marry out of their clan and moiety. This meant that links with distant clans were forged, travel and trade with remote areas were encouraged, and a web of kinship maintained. Reciprocity with the distant groups facilitated all sorts of social, political and economic exchanges.

Several ethnographers refer to the gathering of people in Melbourne for ceremonies (Robinson 23.3.39, 20.4.39, and Thomas 8.9.41, 8.4.40, Batman 20.11.35, Howitt 1904:610, Presland 1983:32). People from the Geelong area, Westernport, Goulburn Valley and Mount Macedon would participate.

Aborigines from the Wurundjeri group would also return visits to the other districts (Thomas 1841). This illustrates the nature of the relationships, movements, contacts, contracts and exchanges between groups.

Unlike several other groups, it appears that little has been written about the Wurundjeri and far less about the Plenty Aborigines. An archival search by historian Paul Hicks over a period of a week revealed very few early references to the Plenty in spite of its proximity to the new settlement on Port Phillip, its position on the overland route from Sydney and its early occupation and development by squatters.

A few brief references noted the presence of Aborigines - usually near water. They were seen catching eels around Whittlesea, fishing at Greensborough and catching ducks on the swamp lagoon on the Diamond Creek at Diamond Valley (Edwards 1979:97). They were also seen on the flats at Eltham and in camps at Kangaroo Ground.

Harrison (1927) relating accounts from the Harrison property at Yan Yean, tells of contact with Aborigines in 1837-1843. Harrison the squatter, was an educated man - a military officer who overlanded his sheep and piano from Sydney and took up 2000 hectares of alluvial flats and roving grasslands near Ryder's Swamp (Edwards 1979: 10-11). He was typical of many of the early settlers encountered by the Aborigines of the Plenty Valley in the 1830s.

"The blacks in that district [The Plenty Valley] belonged to the Yarra Yarra tribe and were considered rather dangerous at first. But only on two occasions do I remember our having an alarm through blacks. The first time, hundreds of them surrounded the house, the quadrangle was full of them ... the blacks evidently thought only women and children were at home, for presently they became very cheeky, knocking at the doors with their waddies and sticks. My father ... suddenly rushed out on them with his gun in his hand; and they were evidently so surprised at the sight of him that they disappeared in a most miraculous manner ... But we could hear a great jabbering going on down at the potato patch... and there, we could see some of the lubras digging up potatoes with their yam sticks. These were always carried about by them and were six or seven feet long, and about as thick as a man's wrist, with a sharp point at one end". (Harrison 1927)

Harrison mentions a second such incident and again how the Aborigines "melted away in their usual silent manner" (p. 18-19). The Harrison children would visit the Aboriginal camp which "was always near the river ... on their station" (p.19). The Harrison station was between the Ryder's Swamp - later to become the Yan Yean Reservoir, and the Plenty River and close to the village reserve (Harrison 1927:18, Edwards 1979 : map of Parish of Yan Yean 1878). The numerous occupation mounds on the banks of the Plenty, Yarra, Darebin and Merri Rivers reported by Smyth last century strengthens Harrison's observation. Favoured locations for mounds were near water, often on the margins of forests, in sheltered locations and were used for many generations (Smyth 1878:239).

Harrison also describes their diet, housing and clothing.

"Aboriginal diet: chiefly of fish (caught by spearing) also: iguana, possum, kangaroo, grubs (from the roots of wattle trees) and the bulb-like roots of yams and murnongs" (p.20).

"Housing" 'nuamas' - strips of bark or long branches of trees, supported at an angle against a fallen log or trunk of a tree, away from the weather side" (p.20).

"Clothing: (in winter) opossum skins joined together by the sinews of kangaroos and other animals ... Men carried spears, boomerangs; women, yam sticks" (p.20).

Garryowen writing of the 1840s and 50s also notes that Rider's [sic] Swamp was "once a favourite retreat for the tribes of that quarter" (1888:561).

Here at the Swamp *"The blacks were in the habit of spearing eels in the early days and selling them anywhere they could. But, sad to say, they used the money to buy rum, of which they were inordinately fond ..."* (Thomas 1927). This site was also *"a theatre for the frequent performance of the rite of Tib-but, an extraordinary sort of haircropping, clay-daubing, skin-dressing and tooth-breaking operation, by which a native youth when he arrives at puberty is propelled from the boy into the 'young man', or in other words Yan Yeanized"* (Garryowen 1888:561).

It seems that although the Aborigines were retiring in some ways they hunted the introduced animals of the squatters as they had hunted the native fauna before they were replaced by sheep or cattle.

John Aitkin reports a bullock speared on his property *"had seen a few blacks during the day in the District, but should not know them again - never had any altercation with the blacks, but when meeting them have always been friendly"* (Thomas 1841).

John Flack - bullock driver for Aitken - *"saw tracks near dead bullock. There was no blacks near the Station to my knowledge that day ... Me and another man was going out into the bush for split stuff on the other side of the river some months back and about one and a half miles from the hut (Aitken's) saw 4 or 5 blacks striped naked, with their tomahawks, they ranked themselves on and across the road, I said to the other man I thought they meant something, he told me I had better turn my dray back and I should then see if they intended harm (- one Aborigine tried to attack with tomahawk - Mr. Ryder and his stockman arrived on the scene and gave chase - found only 2 of the black's dogs and some clothes - later shot the dogs)"* (Thomas 1841).

Robberies were "reported on the various farms on the Darebin Creek and the Plenty Valley" (Blaskett 1879:364, Edwards 1979:88), but Thomas, as Assistant Protector of Aborigines, having visited most of the stations on the Darebin and Plenty found that the reports of intimidation by Aborigines with guns were unfounded (1841).

It was European culture that had a disruptive effect on the Aboriginal culture (Gaughwin & Sullivan 1984: 86-88, Bride 1898:28). The results of a census in 1839 counted 124 adults and children of the Yarra tribe, though this was probably an under representation since there were later reports of 100 Yarra Aborigines at a gathering in 1841 (Presland 1983:28-29). By 1862 the numbers had declined to a total of 18 (Presland 1983:29). Alcohol was an early curse of the indigenous population. Many succumbed to its effects with disastrous results on their way of life. A public house in Yan Yean indiscriminately supplied alcohol as did others in the Port Phillip settlement. Many Aborigines lived in poor conditions there (Edwards 1979:98). But many also voluntarily moved away from the source of the alcohol.

Diseases such as smallpox, venereal diseases and dysentery introduced by the Europeans hit hard a population without resistance to them. Sources of food gathered and hunted by Aborigines were decimated by introduced species: cattle, rabbits and sheep took over the grazing land of kangaroos and emus and the yam daisy or 'murnong', an important element in Aboriginal diet, was destroyed by the hoofed animals.

"No murnong, no yam all Port Phillip, no much by one white man bullock and sheep, all gone murnong", Thomas was told (Thomas in R. Brough Smyth Papers, Box 1176/ba) "I do not think that of the five tribes who visit Melbourne that there is in the whole five districts food to feed one tribe ... they say "no country, no good pickaninny" reported Thomas. By 1848 Thomas recorded only five births and 52 deaths between 1838-1848 for the Yarra and Westernport tribes (Thomas 1848 Returns). It is not clear from these early reports whether those making the counts were taking account of the movement of people which might result in the absence of substantial numbers from the home base or the inclusion of visitors from other clans. As already inferred, ceremonial meetings, warfare and seasonal food gathering patterns were not well understood.

In the absence of more descriptive data from the Plenty, it can be assumed that the Aborigines of the Valley had similar patterns of exploitation of plants and animals for food, clothing, tools, weapons, containers and water craft as did members of adjacent tribes, some of which have fuller descriptions.

3.3 Implications for the Archaeological Survey

Firstly, the early accounts suggest a thriving Aboriginal population occupied the Plenty Valley before contact. Therefore, a community which must have numbered in the hundreds, who fulfilled social, political and ceremonial obligations to the extent recorded probably left evidence of their camp sites and seasonal rounds of resource exploitations. For instance, there are accounts of 'murnong' heaps on the Plenty River, Darebin and Merri Creeks where yams were processed (Smyth in Presland 1984:35). We can assume a full complement of tools, weapons, clothing, containers, water craft and various embellishments made up the material culture, and that the residue of some of these may be preserved wherever Aboriginal people lived.

The manifestation of activities will be in different site types. When hunting gatherers stop to camp for semi-permanent, overnight or meal stops they are likely to leave evidence of this such as scatters of artefacts. The trunks of old trees may carry the scars from the removal of the bark for canoes, shields, containers and shelter panels. Parts of the course of the Plenty and its tributaries are amenable to the construction of fish traps using the basalt boulders. Special attention should be taken of areas adjacent to waterways and swamps - examples of which have been referred to in the ethnographic literature. The existence of excellent flakeable rocks such as chert, silcrete and quartz suggest the presence of quarries. The sandstone of the Gorge forms shallow caves and overhangs which could have been used as shelter and burial niches and the rock itself as a grinding material for making tools and processing foods. Burials however, may be found in all sorts of locations especially where the ground is friable, such as in mounds, and they can become exposed through erosion and other ground disturbance such as excavations for houses.

Nevertheless, only a small fraction of the total material culture of pre-contact Aboriginal life inferred in the ethnographic accounts will have survived. Those vanished components are implied in those that are left - the stone artefact scatters, the scarred trees, the burials.

4. PREVIOUS ARCHAEOLOGICAL WORK

No systematic archaeological study has ever been carried out in the Plenty Valley. The Victoria Archaeological Survey has on its Register just two Aboriginal sites located inside the corridor. They are two scarred trees in a paddock on the Red Gum basalt plains near Woodstock (VAS No. 7992/35 and 36). A small number of other sites have been recorded from places adjacent to the corridor. These have been discovered mostly by accident by interested amateurs, and two are referred to in ethnographic literature.

Sites recorded close to the margins of this corridor consist of a variety of site types. There are scarred trees, mostly Red Gums on the basalt plains, in Bundoora Park, Bundoora Golf Club, Phillip Institute and Blossom Park. At the Bundoora Golf Club there is a silcrete quarry and a scatter of stone artefacts with a variety of tool types including an edge ground axe, a microlith, a core, scrapers and points. From the literature, mound sites already referred to are noted (Smyth 1878:239, Massola 1966:125) but have not been relocated.

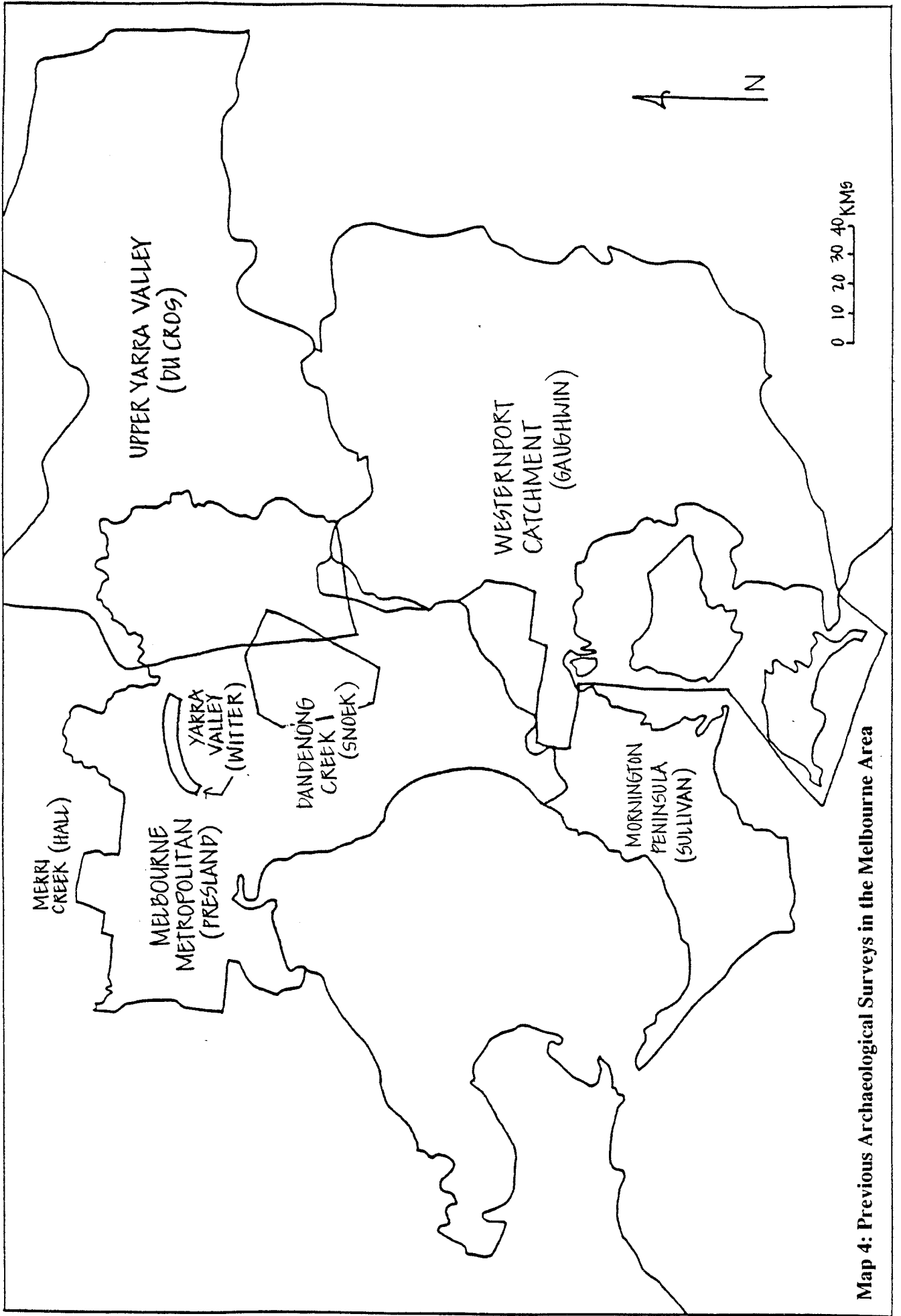
Several major studies have been carried out in regions adjacent to the Plenty corridor. Their results will be examined briefly here. Map 4 shows the location of some of these.

An overview study of the metropolitan area (Presland 1983) resulted in the registration of 40 sites. These included scarred trees, artefact scatters, a fresh water shell midden, salt water middens, burials, rock wells where people could get fresh water, and mounds. One hundred and forty additional sites had previously been recorded. No quarries were found but the rock types used are most likely local ones. All artefacts belonged to the Small Tool Tradition, usually dated to the last 5000 years. Twelve scarred trees were found within one kilometre of permanent water or within an area originally swampland. Twenty seven artefact scatters were found on river terraces and creek banks. The two largest sites in the Kororoit Creek Series (7822/105 and 106) were situated on the crests of slightly raised 'promontories' formed by the bends in the stream. Raw materials were silcrete and quartz.

Bell and Presland's study (1977) of the Maribyrnong Valley Metropolitan Park located twelve sites. Scarred trees were located along the river but this was mainly because the river edge has been left uncleared. Artefact scatters were located on the tops of river terraces and where these meet the basalt plain. Raw materials included chert, quartzite, quartz and silcrete.

To the east, a survey was conducted in the Yarra Valley (Witter & Upcher 1977). A total of 25 sites were located. These were artefact scatters and scarred trees. The artefact scatters are situated on river terraces overlooking the floodplain and the typology suggests they date from the last 5000 years, though there may be undetected older sites in the Pleistocene terraces. Raw materials used are chert, quartz and quartzite. The site pattern suggests a temporary occupation of only a few families.

Further east still is the location of the Upper Yarra Survey (du Cros 1988). Markedly different landscape units contributed to the diversity of types among the total of 37 sites. It is clear from this study that Aborigines used all landscape units and left evidence of their movements in forested uplands and alluvial flats as well as locations close to waterways. Site types included scatters of stone artefacts, scarred trees, a silcrete quarry, a stone arrangement, a ceremonial ground and a set of grinding grooves. Scarred trees tended to be located on the floodplains. Chert artefacts were more common in the east of the study area and silcrete and volcanic rock artefacts to the west. Quartz however, was dominant in most landscape units.



Map 4: Previous Archaeological Surveys in the Melbourne Area

Of interest were the results of chemical analysis of the stone hatchets: two of the nine matched the petrological profile of the prized Mount William greenstone. Residue analysis on a grind stone showed it had been used to grind plant fibre from herbaceous species, seeds and possibly ochre. Two axe heads possibly had grass residue, a third possibly blood and a further artefact - resin and evidence of wood working.

Hall's survey (1987) of the Merri Creek is particularly comparable to the Plenty Valley. The Merri Creek is also a north/south running tributary of the Yarra, which is located west of the Plenty beyond the Darebin Creek.

Twenty-six sites were located - 5 scarred trees and 21 artefact scatters. The raw materials for the artefacts are silcrete, chert, quartz and basalt - sources of which are to be found in close proximity. All the scarred trees are Red Gums located on the basalt plain. The stone artefacts included a high percentage of formal tools which is consistent with the trend seen by Presland in the metropolitan area. The lack of cortex on the stone pieces led Hall to suggest that the tools are prepared cores and may have been brought in from another source location where the cortex has been removed and preliminary preparation carried out. However, one of the locations had the characteristics of a manufacturing site, namely a high proportion of waste and silcrete blades.

Hall points out that he was unable to find the source of the silcrete along the Merri Creek though quartz pebbles were found from which some of the artefacts were made. However, he did find a likely source of chert and this is important in that sources of fine grain silcrete or chert are rare in the Melbourne area in spite of the fact that artefacts of these materials are abundant.

Furthermore, Hall discovered that sites tended to be located on higher well drained ground above the flood levels and at the interface of valley and plain. Numbers of artefacts declined with increased distance from the creek.

The Bunurong tribe of Westernport and the Mornington Peninsula were studied by Gaughwin and Sullivan (1984). Most of the 600 sites were found on the coast (because these are more obtrusive) but people also used the Westernport coastal plains. Sites indicated that swamps impeded movement but also attracted people.

Eels were an important food resource in the Bolin swamp on the Yarra.

Silcrete (available on the Peninsula) is abundant and greenstone artefacts from Mt. William, well north of the Plenty Valley, were brought to these coastal sites.

In fact the Bunurong had considerable contact with the Woiwurung clans as well as other tribes from Geelong and Goulburn, in the form of ceremonies.

All the sites mentioned so far have been surface sites. In the absence of datable material they can only be dated approximately on the basis of tool types and morphology. An exception to these are the sites at Keilor in the Maribyrnong Valley. The Keilor site has been excavated over a period of 10 years and has uncovered artefacts in strata that could be as old as 36,000 - 40,000 years before present (B.P.) The Green Gully site also in the valley dates to around 17,000 years B.P. (White and O'Connell 1982, Presland 1983) - the time of the last glacial maximum. People have occupied the Australian continent for at least 40,000 years. These sorts of dates come from far flung locations in the southern parts of the continent as the Upper Swan, (W.A.), Mungo (N.S.W.) and Keilor (North of Melbourne).

4.1 Summary

There is ample evidence from the time of European contact and for a considerable time before, that Aboriginal people occupied all the country around what became Melbourne. The rivers and creeks were clearly important as the majority of campsites are positioned on dry, high places close to creeks and rivers. Elsewhere are the signs that people moved over the landscape in their seasonal rounds of resource exploitation and ceremonial, social and economic exchanges. People were knowledgeable about their environment and knew of locations of such materials as good flaking rocks for tool making or sandstone for grinding and the best areas to provide the seasonal vegetable and animal food sources. Most of their quarries have not been located but they left evidence of their tool making activities around swamps and waterways. The most likely site types expected in the Plenty Valley will be scarred trees and artefact scatters with a "background noise" of isolated artefacts. Less common site types such as quarries, mounds, burials and stone arrangements may also be found. The presence of very old sites of Pleistocene age (at least 10,000 years old) in river terraces at Keilor (23kms away) points to the need to be aware that such old terraces could also exist on the Plenty River. From the local geology, tools of chert, silcrete and quartz, can be expected, but artefacts of exotic materials (such as the Mt. William greenstone) may also be present in small numbers.

The material that survives from these activities is usually only the durable stones and shell and long-living trees. The organic artefacts of wood, fibre, fur and animal products have usually weathered away so that we are left to speculate on concealed aspects of the material culture. Accounts from the pioneering period help piece together the past but agriculture, urban development and natural processes such as erosion and aggradation have further clouded our view of the past.

Nevertheless, survey work already carried out helps to construct predictive models for the location of sites and to reconstruct past activities and lifeways. This survey aims to add one more piece to the jigsaw.

5. METHODOLOGY

A period of initial research and preparation was aimed at a familiarisation with the project requirements, the study area and the selection of suitable strategies for the survey. Background research on the geology, topography, previous work and ethnographic accounts was augmented with information from aerial photographs and maps. A drive around the corridor early in the project allowed a better understanding of the environment and an assessment of practicalities such as access to different parts and ground visibility.

This was also a time to introduce the team to Rangers, local councils, landowners and local historical societies and to begin the process of gaining permission for access onto private land. This introductory process was greatly facilitated by a simple 'flier' which laid out the aims of the project and field work and indicated the approximate boundaries of the corridor (Appendix 2). Copies were left in strategically placed corner shops, council offices and public places such as libraries and were also useful for 'breaking the ice' when approaching landowners. An interview with the Diamond Valley News served to publicise the aims of the survey and encourage public response. A follow-up article will complete the process of raising public awareness by drawing attention to the results.

5.1 The Area Sampled

During the survey a decision was made to restrict the area of coverage to that part of the corridor south of Whittlesea. This was done for a number of reasons.

1. Given the time constraints, it was felt that resources and time would be better deployed by concentrating on that part of the corridor which is under greater pressure of imminent development - the southern three quarters.
2. The land tenure pattern around Whittlesea and along Scrubby and Bruce's Creeks is one of numerous small holdings and therefore already developed to a degree. Surveying several small holdings has the double disadvantage of requiring a considerable amount of time liaising with the numerous landowners and the land surface has already been greatly disturbed.
3. Finally, the visibility of the ground surface in this region is considerably reduced. The grass is unmown and ungrazed. In addition, the four major creeks converge to form the Plenty at Whittlesea, to the north of which there is a long history of sediment aggradation through floods and swamps which tend to cover archaeological sites.

Therefore, the results of the survey pertain to the corridor area south of Whittlesea. A small extension beyond the boundaries especially in areas of high development risk on the southern and western boundaries of the corridor were added to the survey.

5.2 The Survey Strategy

"An archaeological survey is the application of a set of techniques for varying the discovery probabilities of archaeological materials in order to estimate parameters of ... a more or less continuous distribution of artefacts over the land surface with highly variable density characteristics." (Schiffer et al 1978:4).

The parameters of the regional archaeological record will be determined by the aims and techniques of the project. In the case of the present study the aims of the field work were to locate, document and assess the distribution and nature of Aboriginal sites in the corridor with the view to identifying areas of high archaeological potential.

5.3 Opportunities and Constraints

Several factors affect the discovery probabilities of a survey. They include those that are out of the control of the archaeologist and those that can be controlled (Schiffer et al 1978).

Factors out of the control of the investigator include the time constraints, the area to be covered and the timing of the survey, which are rarely optimal for a complete and intensive survey of a region. The Plenty corridor covers approximately 138km² and the study time from beginning to report submission was three months. Thus a sampling strategy was essential in order to achieve a representative coverage of the region. This allows for more precise and accurate examination of a smaller but representative area.

5.3.1 Accessibility

Accessibility can be an unavoidable problem. Apart from physical difficulties such as those dictated by the environment, like rugged terrain or impenetrable blackberry thickets, there are those everyday constraints such as refusal of access by landowners and the presence of dangerous animals such as bulls and snarling dogs.

5.3.2 Obtrusiveness of Sites

The abundance and obtrusiveness of artefacts will affect the chances of their discovery. Obtrusiveness means - how obvious the artefacts are to an observer. Furthermore, artefacts may be spatially clustered with rare sites reliant on limited and patchy environmental criteria such as an isolated outcrops of flakeable stone. Artefacts on sites with high obtrusiveness will be over represented in a survey. For example, large sites on eroded ground and scarred trees are more likely to be discovered than isolated artefacts or partly covered sites.

5.3.3 Ground Surface Visibility

The success of a survey depends a lot on the visibility of sites. Optimal times for site surveys are after ground cultivation, fire or when grass has died back after summer, but it is not often possible to time studies to these specific events. Without these aids to expose the ground surface, there is a reliance on searching eroded and disturbed areas and the tracks of animals and vehicles.

Visibility is determined by characteristics of the archaeological sites and also by environmental factors. Artefact scatters are easily eroded or become covered and concealed by vegetation. That is, sites of low obtrusiveness are least visible. Day to day factors such as the slant of the sun, how recently rain has fallen and even the direction in which the observer walks can have a bearing on the visibility of sites. But, parts of the study area will have been so disturbed by agriculture, land clearing and urban development that sites will have been badly disrupted if not totally destroyed. Ground visibility in urban areas is usually the poorest (du Cros 1988:41). There are of course a number of strategies that can improve the detection of sites including labour and cost-intensive and time-consuming techniques such as augering and test excavations.

Visibility is measured in terms of the percentage of ground surface that is exposed. This is calculated by examining a meter square and assessing the percentage of it that is free of vegetation. Only with a ground visibility of greater than 20% can an archaeological survey be effective (Simmons and Djekic 1981:25). Visibility is improved where the ground is bare of vegetation such as in desert areas and coastal dunes and where the ground has been recently ploughed and rained on. However, some site types such as scarred trees are not affected by ground visibility. Plates 8, 9 and 10 illustrate examples of the sorts of ground exposure that make sites visible - eroding ground, vehicle tracks and a trotting track.

5.4 Design of the Survey

Factors within the control of the archaeologist amount to the ability to construct the optimal research design which will take account of the constraints just described.

The design of the survey must include the broadest coverage of the corridor land to ensure a representative sample of landscape units and site types is obtained. A reliable model derived from such a sample predicts the probability of finding sites in un-surveyed areas.

Land to be surveyed is selected on a number of criteria. Good ground visibility is important and this can be ascertained from vehicular inspection, aerial photographs and maps. Large properties or a block of several properties offer the best opportunities of sampling several landscape units and minimise the time spent acquiring access permission and relocating between survey areas is minimised. A degree of flexibility and opportunism is essential to take advantage of good visibility and access. For this reason, some areas outside the corridor were sampled. These included an area west of Mernda and to the south of the corridor where the Gorge abuts Greensborough.

The corridor was divided into the landscape units described in 2.7 above. These are:

1. Hills/Uplands
2. Basalt Plains
3. Sedimentary Landscape
4. Alluvial Floodplains
5. The Gorge

Their definition is based on environmental information concerning the geology, vegetation and topography derived from maps, aerial photographs and the Land Conservation Council (1973) and are described in Section 2.7. The proportion of each unit to the total is set out in Table 1.

5.5 The Field Survey

Areas selected from the landscape units were inspected on foot. From two to five people working at 10 meter intervals covered the ground and purposively examined all exposed areas. All trees of a suitable size and age were examined for scars. Rocky outcrops were inspected for signs of stone procurement. A total of 19 days were spent on this survey.

5.6 Consultations

5.6.1 The Aboriginal Community

At the beginning of the project, the aims and objectives of the survey were discussed with the spokesperson of the Wurundjeri Tribe Land Compensation and Cultural Heritage Council. The project included funding for an Aboriginal Liaison Officer and Grant Desmond was appointed for the first half of the field work programme and Allan Wandin in the second half. The aims of Liaison Officer employment is to ensure that information concerning Aboriginal sites is disseminated to the relevant communities and that they have input into the study, and that Aboriginal people be given the opportunity to gain skills in map reading, artefact identification and site recording techniques. In this way, they gain insight into the function, nature and methodology of archaeological work and how it relates to their cultural heritage. The Liaison Officers were given information about environmental aspects of the Valley including the geology, hydrology and vegetation and instruction in artefact identification, site location and site recording. After some preliminary help both were able to assess environmental aspects and independently fill in the Victoria Archaeological Survey site record cards.

The Liaison Officers also acted to channel information from the survey to the community. There is to be a follow through by the Archaeologist at the end of the project to discuss the results and implications of the work.

The Liaison Officers were also responsible for finding out if any Aboriginal people lived within the corridor who would be interested in being involved and/or informed about the study. A plain language report will be sent to the community at the end of the project which will be the community's prerogative to circulate.

5.6.2 Landowners

No direct replies were received from the circulation of the flier which introduced and explained the project and which was left in public places. Nevertheless the leaflet was very useful when liaising with landowners. The people of the Plenty Valley are acutely aware of the implications and imminence of the corridor development and of the long and continuous history of the Valley. Thus a considerable amount of time was taken up in discussions with landowners and elderly residents in order to secure access to land or information about archaeological sites. Only in one instance was access refused. By and large people were receptive towards the idea of sites of heritage importance on their property. Appendix 2 is the flier.

5.7 Site Recording

5.7.1 Recording Data

When an Aboriginal site was discovered, data was recorded that would help in the documentation and analysis of the site and an assessment of its importance. Plate II shows the recording of a site at Carome. A site recording sheet was used during field work for this project.

Basic information must include detail of the location of the site, its contents, its environmental context and its integrity. Scarred trees required specific measurements. Photographic documentation was also carried out. Victoria Archaeological Survey site record cards were filled out on completion of the survey, and lodged in the State Register.

5.7.2 Definitions

Site types are defined in terms of their function or in descriptive terms.

Artefact scatter - this is a scatter of stone artefacts over a variable area. Scatters contain at least five artefacts on the surface of the ground in a 5 meter radius. The artefacts may be of a variety of types. See Appendix 4 for explanation of tool types.

Isolated artefact - in this survey, less than five artefacts in a 5 meter radius were counted as an isolate or discard rather than a site such as an artefact scatter.

A scarred tree is caused by removal of bark for the purpose of manufacturing a canoe, shield, container or shelter. A tree may have several scars and the scars may be of various dimensions. A scar is deemed to be Aboriginal in origin (as opposed to naturally caused or of European origin), when it exhibits a clear symmetry, has more or less parallel sides, is the shape and size (before bark regrowth) of a canoe, shield or container or of panels for shelters. The scar may have axe marks. It is sometimes possible to discern the difference between metal and stone axe marks.

Aborigines used metal axe heads after contact so it is not usually possible to differentiate between Aboriginal and European metal axe marks. Essentially, all natural causes for a scar on a tree must be eliminated.

Workshop - is a type of artefact scatter which may be composed of a more specific group of artefacts. In order to make flaked stone artefacts, the original piece of stone is prepared into a manageable core by flaking away the outer surface cortex and irregularities. The pieces that are the waste products of this process are mostly small, irregular and not useable as tools. In the preparation of a core, a striking platform is created which allows the toolmaker to strike the core at the appropriate angle to form the tool of choice - a long blade or a sharp tipped flake. Depending on the raw material and the toolmaker, there may be flakes struck that are not suitable and these may be rejected.

So the workshop is likely to exhibit evidence of all these events. A large proportion of cortex (pieces of the outer surface of the stone) to flaked material indicates that this is the location where the initial preparation of the stone is carried out. Large quantities of waste flakes and fragments and of cores suggests that the site may be a manufacturing site - a workshop. It is likely that the number of finely prepared tools will be proportionately small as this process may be conducted elsewhere at a later time. The workshop location releases the blanks of tools which are more manageable and transportable than the original piece of stone.

Quarry - large pieces of stone are hammered out or collected from the rock source. This leaves a dug-out depression with perhaps piles of boulders which have been removed for better access. Quarries may be accompanied by their own workshops. For example the Mount William Greenstone axe quarry in north central Victoria exhibits all these features, since its product was highly valued throughout the southeast of Australia, and it was probably exploited for some considerable time. The product that left the quarry was the axe blank - that is, the basic shape before fine pecking and grinding of the edge.

Mound - in areas prone to flooding, people would build a mound of soil above flood-prone ground and occupation debris accumulates over a period of numerous visits. Mounds contain food refuse, artefacts, oven stones, burnt soil and frequently burials. Typically mounds are found in basalt areas where the rock is impervious and the ground prone to retaining surface water (Williams 1985) and on flood plains where the ground is damp.

Artefacts produced by people in response to their daily needs are classified according to their morphology and function. Hall's definitions are used here (1987:40-43). The most common types found in Victoria are listed in Appendix 4.

5.7.3 Discussion

Pre-contact Aboriginal artefacts had similar functions to the tools found in any work shop today. During the construction of these a quantity of waste stone chips and flakes are left, some of which may still bear the cortex or outside of the original piece of rock, as well as a few rejected flakes. The stone scrapers, adzes, burins and hammerstones were used to make tools and articles of other materials such as spears, waddies, digging sticks and shields of wood, bone points, cloaks and bags of animal skin and plant fibre cord, rope and netting.

The morphology of the stone artefacts also supplies information about chronology. Small tool types usually include finely worked geometric microliths such as thumbnail scrapers and backed blades. In Southern Australia such tool groups have been assigned the term "Small Tool Tradition" and it is believed to date from 5000 years ago to the present.

5.8 Site Significance

Coutts and Fullagar (1981) have discussed the concept of 'significance' with regard to Aboriginal archaeological sites. They point out that although Aboriginal archaeological sites have special status in that they are all protected by the law (Archaeological and Aboriginal Relics Preservation Act 1972 and Aboriginal and Torres Strait Islander Heritage Protection Act 1984), because of competition for land, the unequal and variable distribution of funds to and by management agencies, and the on-going destruction of some sites by natural processes, not all sites can be saved. But such sites are a non-renewable resource and "it is vital, not only to establish significance scales and priorities but to establish explicit and consistent criteria for assessing these" (Coutts and Fullagar 1981:3).

The significance of an Aboriginal Archaeological Site is assessed according to its scientific, Aboriginal and social values.

These are discussed fully in Section 9.

6. RESULTS

6.1 Introduction

A total of 70 sites were identified and documented in addition to the two scarred trees previously recorded. (See Map 6 and Gazetteer of Sites). The sites consist of 16 artefact scatters, 20 scarred trees and a grave. Also recorded were 33 isolated artefacts (see definition of Sites-Section 5.7.2). For the purposes of describing and discussing the pattern of archaeological site distribution the two previously recorded scarred trees will be included.

Generally speaking, the visibility of the ground surface was poor throughout the study area. At best, ground exposure was 30% in parts of the Gorge and poorest on the hills/uplands where it was 2%. Naturally this has a bearing on the number and types of sites found on the different landscape units. Scarred trees however, were visible whatever the ground visibility. Most other sites were revealed in areas of good ground visibility such as erosions, due to soil and vegetation loss, animal and vehicle traffic and ground cultivation.

The hills/uplands unit exhibited a great paucity of sites. Only 2 isolated artefacts were found, though the density of these over the unit may be quite substantial.

On the basalt plains, two site types were found - scarred trees and isolated artefacts. All the scarred trees were Red Gums, and this unit probably had a high frequency of this site type before much of the Red Gums were cleared for agriculture and their timber.

The sedimentary landscape exhibited high frequencies of artefact scatters, scarred trees and isolated artefacts. This is indicative of intensive occupation and use of this unit by Aborigines in the past.

The alluvial flood plains are largely an unknown entity. The exact pattern of deposition and scouring by floodwaters is unknown. One large and significant artefact scatter was exposed by a recently cut trotting track. Red Gums also grow on the alluvium near natural water courses, and scarred ones were noted among these.

The Gorge had high frequencies of artefact scatters, isolated artefacts and scarred trees. It is likely that other site types will be found here too, with more intensive exploration.

Raw materials consisted of silcrete, quartz and chert. No quarries were found to elucidate their sources.

The results of the survey as they relate to the landscape units will now be examined in detail. Table 1 shows these results, the sampled area of each landscape unit, the ground visibility of the sampled area and the densities of the three main site types. Map 5 demonstrates where the transects of the sampled areas were carried out.

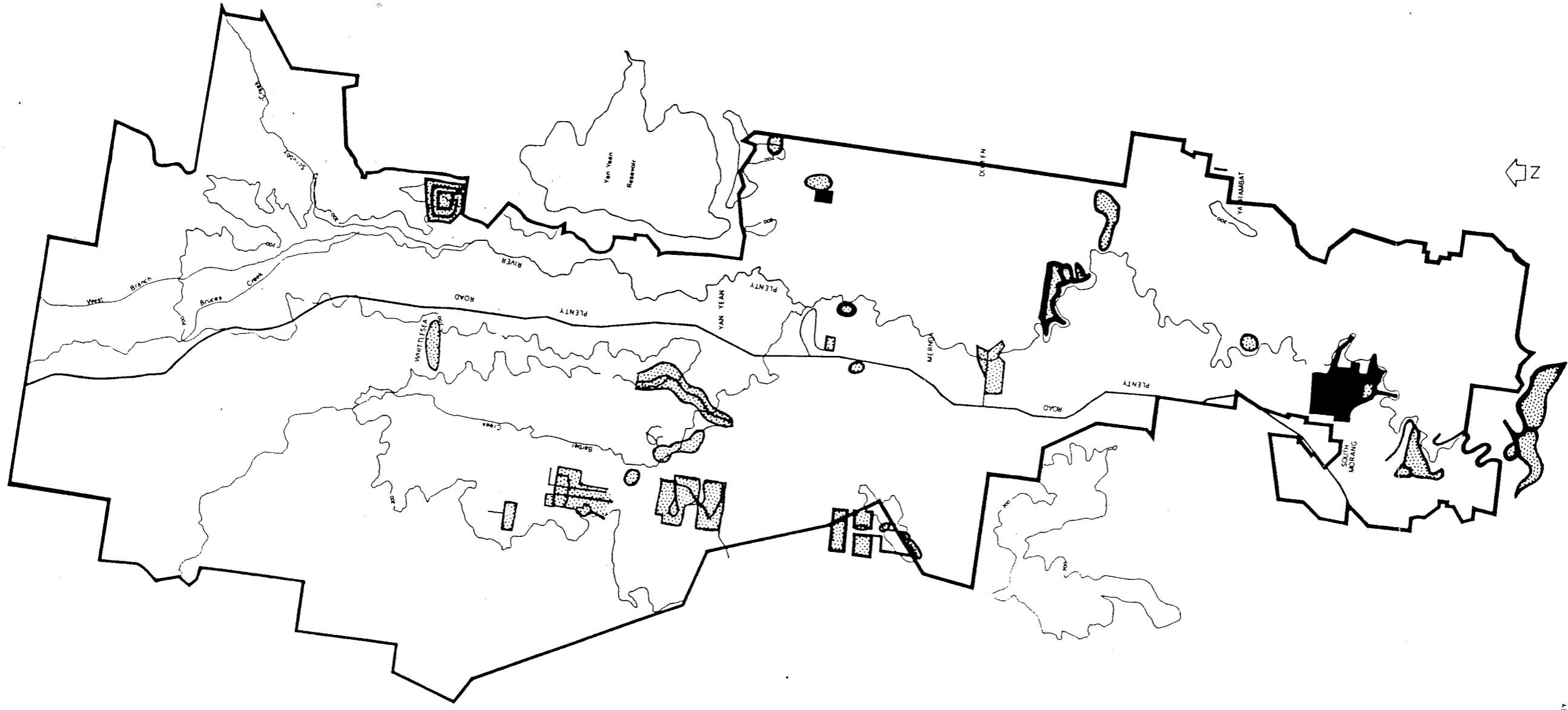
6.2 The Survey

For this study, from two people to two teams of two or three people were deployed to cover as much ground as possible. See Map 5. Each person walked a transect and inspected the ground on either side. The effectiveness and extent of this surveillance depends a great deal on the surface visibility. For instance, if visibility was poor, effective inspection was reduced to one meter (or less) on either side of each observer.

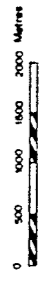
Table 1: Number of sites and site densities on the landscape units

	SITES LOCATED				TOTAL	LAND- SCAPE UNIT AREA (KM2)	AREA SAMPLED (KM2)	SAMPLE AS % LAND- SCAPE UNIT	% VISI- BILITY	SITE DENSITIES		
	SA	AS	ST	IA						AS	ST	IA
Hills/Uplands		0	0	2	2	14.75	0.08	0.5	2	0	0	1250
Basalt Plains		0	11	3	14	22	0.3	1.4	4	0	43	250
Sedimentary Landscape	1	9	5	17	31	23.75	0.4	1.7	24	94	13	177
Alluvium		1	2	0	3	17	0.06	0.4	24	69	33	0
Gorge		6	2	10	1	6.75	0.2	3.0	30	100	10	183
TOTALS	1	16	20	33	70	84	1					

WHERE SA - Stone Arrangement
AS - Artefact Scatter
ST - Scarred Tree
IA - Isolated Artefact



- KEY
- 12 METRE TRANSECT
 - 8 METRE TRANSECT
 - 4 METRE TRANSECT
 - AREAS OF INTENSIVE SURVEY
 - SAMPLE AREAS
- NOTE: THE BOUNDARY LINE WAS NOT SURVEYED



MAP 5
 AREAS SURVEYED IN THE PLENTY CORRIDOR (NOV. 1988)

Bad visibility was encountered on the alluvium where grass was long and thick. Better visibility existed in parts of the Gorge where grass does not grow under trees and steep parts are eroded. Here transects could be as wide as 6 meters, though this was very patchy. Larger properties lent themselves to long, uninterrupted transects. (See Section 5.3.3 for how visibility is quantified).

The area of transect walked by each individual was found by multiplying the length walked by its effective width. The sum of all transects in each landscape unit became the surveyed sample of each unit.

Predicted site density was calculated from a formula which takes account of the variables - the number of sites found, the amount of ground effectively inspected and the visibility factor.

$$\begin{array}{rcl}
 \text{Hence} & & \\
 \text{Density of sites} & = & \text{Number of} \\
 \text{(per km}^2\text{)} & & \text{sites found} \quad \times \quad \frac{100}{\text{Area effectively surveyed (km}^2\text{)} \times \text{Visibility \%}} \\
 & & \text{(Ranson pers. comm)}
 \end{array}$$

This formula provides a predictive statement about the number of sites that can be expected to occur in each landscape unit.

Each landscape unit will now be reviewed for patterns in site distribution, density and archaeological sensitivity. Map 6 shows the sites located on the survey.

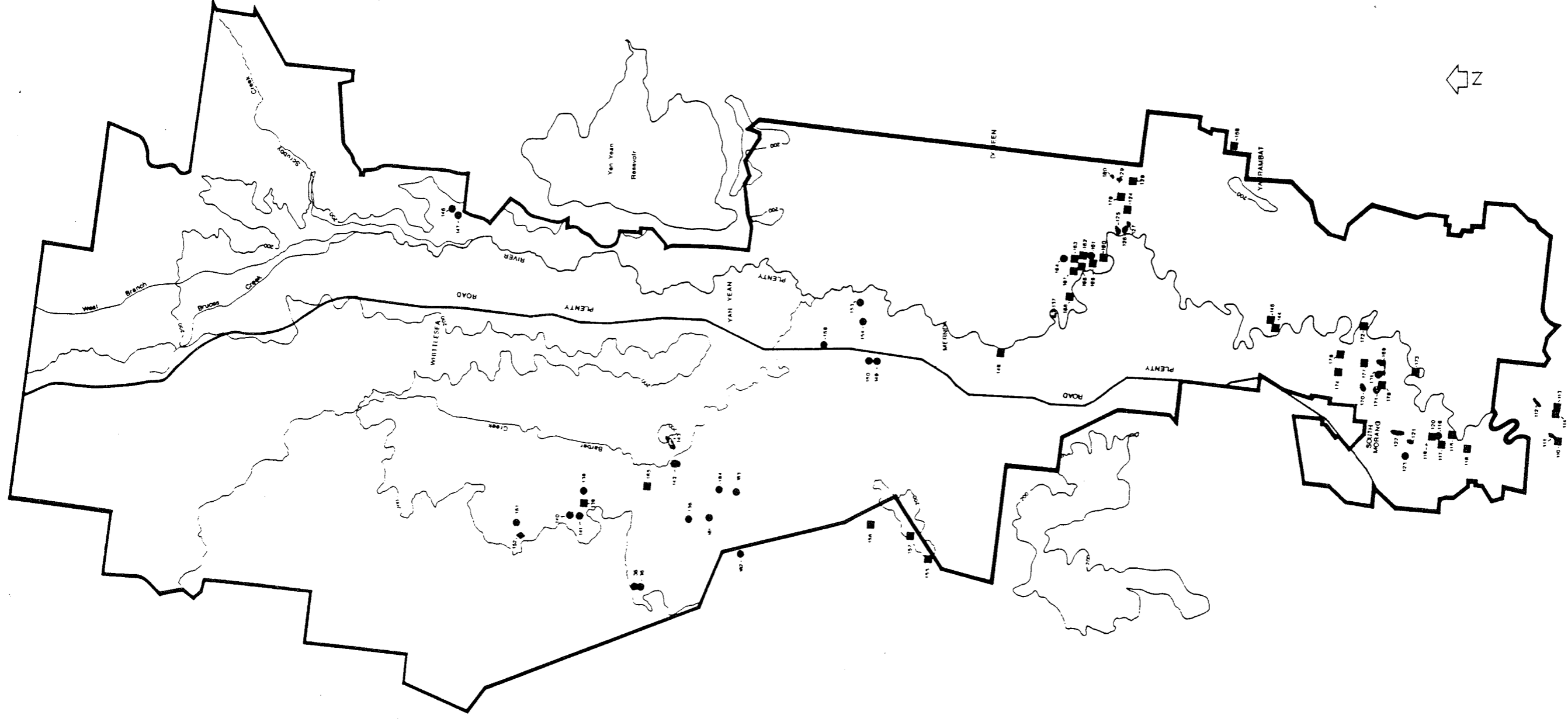
6.3 Hills & Uplands

Of the 14 km² total unit area, 0.08 km² (or 0.5%) was surveyed intensively. An additional 0.75 km² outside the corridor boundary was included in calculations. (At this stage of the survey the western boundary of the corridor had not been finalised.) Just two isolated artefacts were located (See Table 1 and Map 6). These were found on a low hill overlooking the Darebin Creek, to the north of Bridge Inn Road.

Visibility for this unit was poor (2%) (see section 5.3.3). Generally pasture was dense and often long though some graded patches on She Oak Hill were barren probably as a result of vegetation clearance and a steep slope.

A site density of 1250 isolated artefacts per 1km² can be expected, though given the small sample and poor visibility this figure should be treated with caution.

The two isolated artefacts recorded in this unit are chert cores (VAS 7922/155,157). Located halfway between these two, further down, on the sedimentary plain, was another chert core and associated chert flake (VAS 7922/156). One of these cores measured 50x60x20mm which made it the largest artefact (apart from hammerstones) found in the study area.



- KEY
- ISOLATED ARTEFACT
 - SCARRED TREE
 - ◆ GRAVE
 - ◻ ARTEFACT SCATTER/CAMPSITE

MAP 6
SITES LOCATED IN THE PLENTY CORRIDOR

6.4 Basalt Plains

Of this unit, 0.3 kms² or 1.4% was surveyed - (See Table 1 and Map 5). This is difficult terrain, being a combination of irregular rocky outcrops and floaters with intervening marshy hollows and pasture. Like the previous unit, this had a poor average visibility (4%), as it is terrain given over mostly to unimproved grazing and too difficult to cultivate. At the time of the survey, flood waters had inundated some areas and the water was trapped for a couple of weeks by the imperviousness of the basalt further reducing visibility. Large portions of the unit still support a variable scatter of Red Gums.

Table 1 shows that eleven of the fourteen sites found on this unit are scarred Red Gums. They are located throughout the unit and not necessarily close to permanent waterways (for example VAS 7922/149, /150, /138, /141, /35, /36). An average density for this site type on the forested part of the basalt plains is 43 per km². (The two previously recorded scarred trees within the unit have been included in calculations - 7922/35 and /36). This is the highest density of scarred trees in the study area.

In addition to the scarred trees, three isolated artefacts were located. These were more than 400m from permanent fresh water. A density for this site type in this area is 250 per km². The artefacts were made of quartz and chert.

6.5 Sedimentary Landscape

This is the largest landscape unit (23.75km²) and 0.4kms² (1.7%) was effectively surveyed. An additional 0.75km² outside the corridor is included in this analysis the western boundary of the corridor had not been finalised at this stage. Examples of each site type was recorded.

(See Table 1 and Maps 5 and 6).

Visibility of the ground surface was variable. An average for the unit was considered to be 24%. Grazing is the most common land use, though in the past the unit supported cultivation and extensive areas have been ploughed. Hence, most of the unit has been cleared of native vegetation. There were however, small areas of erosion where visibility was enhanced to around 80%. Together with farm tracks, these eroded patches provided the best opportunities for the exposure of sites. Indeed the nine artefact scatters recorded were all located in this manner.

Site types identified were scarred trees, artefact scatters, isolated artefacts and a grave (See Table 1).

Five scarred trees were located. A frequency of 13 scarred trees per km² is predicted for this unit which is third highest for the study area. Unlike those on the basalt plains, the trees were usually other than Red Gums. Most were located close to the Gorge (VAS 7922/161, /164, /123) or on other waterways. (VAS 7922/151) found on a tributary of Barber's Creek. This latter example is the only one found which had three scars on it. However, the tree is now dead, and, according to locals, a year ago was blown over onto its side. It is now prone to the deterioration processes of inundation and termites and the largest scar faces upwards towards the weather. All the other recorded trees are alive and include some excellent examples of this site type.

Nine artefact scatters were located and an additional seventeen isolated artefacts. The majority of these were located near permanent water (<400m) and the rest associated with less permanent tributaries but still within 1000m of permanent water. The density of artefact scatters in this unit 94 per km², is second to that predicted for the Gorge.

The artefact scatters consist of variable proportions of artefact types and raw materials. Most sites, because of the eroding circumstances by which they were found, also have a varying degree of disturbance. However since they sit on fairly flat ground, the artefacts may not have been moved far from their original locations.

Four extensive sites were identified at Blossom Park Pony Club (VAS 7922/121, /122) and at the "Riverside" property in South Morang (VAS 7922/169, /170). All these are scatters of artefacts between 200-1000m from the Plenty River (See Map 6 and Plate 8). Blossom Park Pony Club 7 (VAS 7922/121) is scattered over 14160m² of eroded ground probably originally about 20 cms below the surface and contains a wide variety of artefacts, see Figure 3. Artefacts included hammerstones, a large quantity of chert and relatively few retouched pieces (tools) suggesting this may be a procurement site where people obtained raw material for tool making but did not go to the extent of making finished tools. A brief examination of the banks of the Plenty River tributary 300m away showed that sedimentary rocks are exposed there, but no chert was identified.

"Riverside" 1 and 2 (VAS 7922/169, /170) were also wide dispersals of rather small artefacts - mostly fragments (Figure 3). Spatial patterning in "Riverside 1" showed a preponderance of quartz to the East of the site grading into chert and silcrete further West over a distance of 300m. This may imply changes of site function or changes in raw material availability or procurement over time. This site is associated with a scarred tree (VAS 7922/131).

A number of medium to small sites are of individual interest. "Riverside" 3 (VAS 7922/171) is a discrete collection of chert flakes and fragments that may well fit back together to form the original core piece. This would give insight into the reduction sequence of forming the flakes from the original core. Associated with these were three finely retouched tools (scrapers) made from a light green, hand-made glass (See Table 2 and Figure 2).

A site off Donnybrook Road (VAS 7922/143) is exposed on a farm track. Among the eighteen artefacts were several tools with well-used and battered edges and a denticulate tool (having a saw-tooth edge) not found on any other site in the study area. See Figure 3. Any association with the 1868 halfpenny also on the track is unclear.

Other medium sized artefact scatters were identified in the Yarrambat Metropolitan Park (VAS 7922/127, /129, /180). Isolated chert artefacts were also found in the Park.

Table 2: Average percentages of raw material by landscape units

	CHERT	QUARTZ	SILCRETE	OTHER
Hills/Uplands	100	0	0	0
Basalt Plains	16	83	0	0
Sedimentary Landscape	25	44	41	Basalt, Glass
Alluvium Floodplains	5	46	49	0
Gorge	54	23	11	Siltstone, Basalt
Presland	23		63	
Hall	0.3	24	74	

In addition to the more common site types, a stone arrangement located on a property off Selkirk Road which is said by oral tradition to be a grave of an Aborigine (VAS 7922/152). People whose families have lived in the district since early this century and earlier recall this information. It comprises two irregular rows of stones with a large one at the head which neighbours remember used to stand upright. From directions given by these neighbours it was eventually located in knee high grass and rushes. This was the only stone arrangement and grave located in the study area.

6.6 Alluvial Floodplain

Of the total area of this unit (17km²), 0.06 km² or 0.4%) was intensively examined. A total of three sites were identified - two scarred trees and an artefact scatter (See Table 1 and Map 6).

For the most part, ground visibility of this unit was by far the poorest in the study area but the figure was greatly enhanced by the fortuitous recent exposure of a cultivated field and a trotting track (Plate 10). Thus the average visibility climbed to 24% (the range being <1-80%). This landscape unit is prone to be marshy and flooded and hence has been partly left unimproved. The grass was often knee high and sometimes up to a meter and a half. Rushes, Thornbush and Teatree scrub made access difficult in places especially on the banks of the Plenty.

The large old Red Gums however, are not affected by the poor visibility, and two scarred ones were found north of Cades Road (VAS 7922/146, /147). The visibility for scarred trees is considered to be 33%. This unit has the second highest density of scarred trees (33 per km²).

The single artefact scatter was exposed by a newly cut trotting tract south of Donnybrook Road (VAS 7922/142). Sixty-one artefacts were identified. Raw materials used were in the proportion of chert 5%, quartz 46% silcrete 49% (Appendix 5 and Figure 2). In the assemblage were a number of fine, large silcrete blades indicating that there was a specialised industry here. There was also a high proportion of mostly unmodified flakes (Figure 3). There are probably undisturbed deposits at this site. It appears to be associated with another site which stretches up the slope of a sedimentary rise above the alluvium (VAS 7922/143). This too has a high proportion of blades in the total collection (Figure 3). The density of artefact scatters in this unit is predicted as 69 per km², - third highest of all the landscape units.

6.7 The Gorge

This is the smallest landscape unit in the study area. An additional 0.75km² from just outside the corridor boundary makes the total area 6.75km². Of this, 0.2km² (3%) was effectively surveyed (Table 1 Map 5).

A total of 19 sites were identified and these were composed of two scarred trees, six artefact scatters and eleven isolated finds. (Table 1)

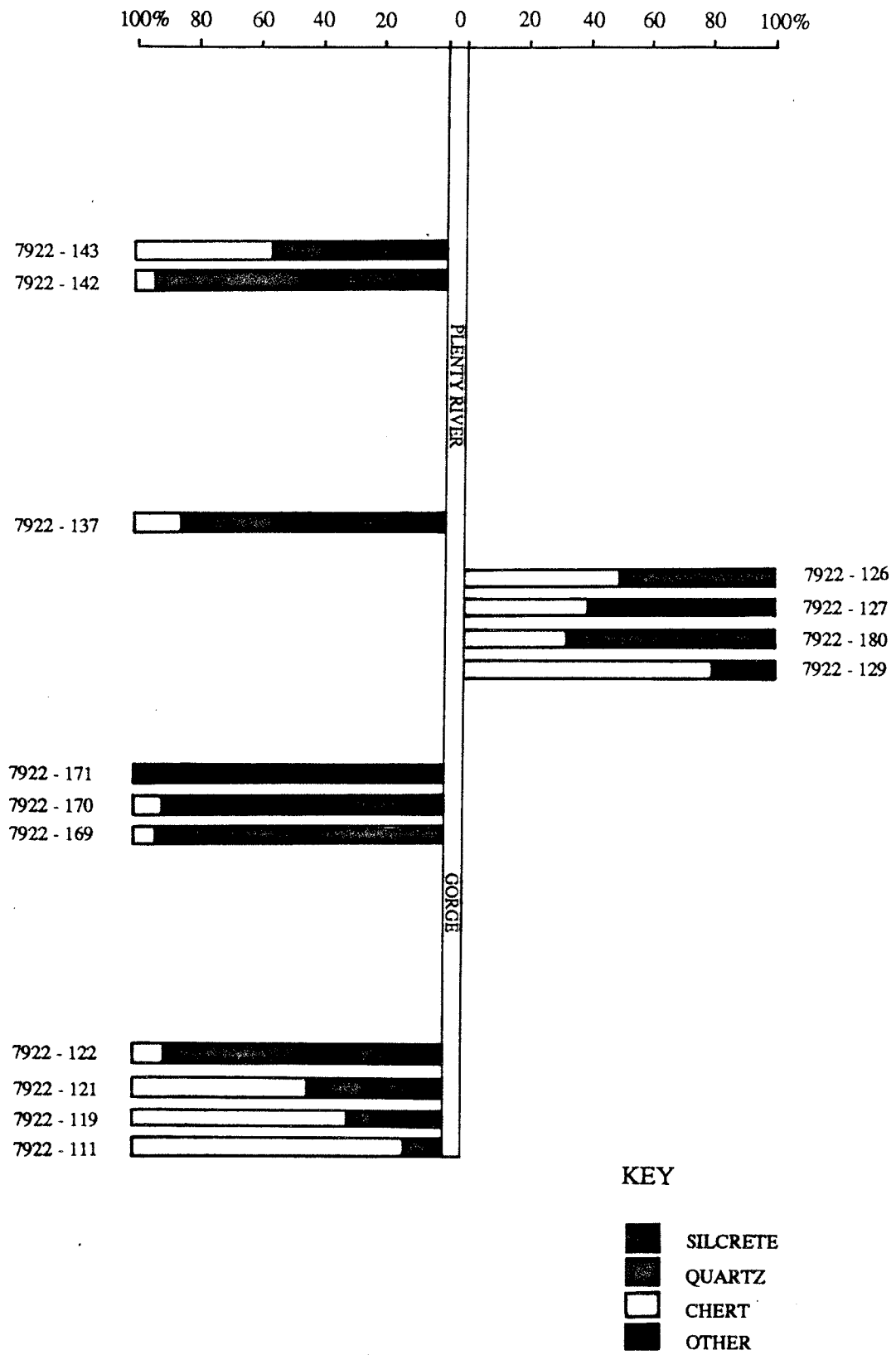


FIGURE 2 PROPORTIONS OF RAW MATERIALS IN FOURTEEN SITES.

Visibility for this unit was the best for the study area, though very variable. An average of 30% covers the range from <10% on pastures to 80% on erosions and bare patches beneath trees. Much of the 200m on either side of the Plenty River is still in its natural state and deeper, rocky and difficult parts of the Gorge such as east of South Morang were not explored intensively. Of the two scarred trees found in the area surveyed, one was probably a Box Gum (VAS 7922/116), and the other a Red Gum (VAS 7922/153). The density of scarred trees is 10 per km² and 100 artefact scatters per km².

Artefact scatters were located on high points above the Plenty River well clear of flood levels. If there were sites below this, they have not been found or possibly because they have been swept away or covered over by sediment from floods.

Favoured high spots appear to be the gentle sloped spurs between river meanders. This is where the Janefield sites (VAS 7922/111, /112), Yarrambat Park 2 and 3 (VAS 7922/125, /126) and the Carome (VAS 7922/137) sites are positioned. Blossom Park Pony Club 5 (VAS 7922/119) is situated on the rim of the Gorge. Visibility of these sites is good at present because most of these locations are being actively eroded by natural processes and the tracks of animals, people and vehicles.

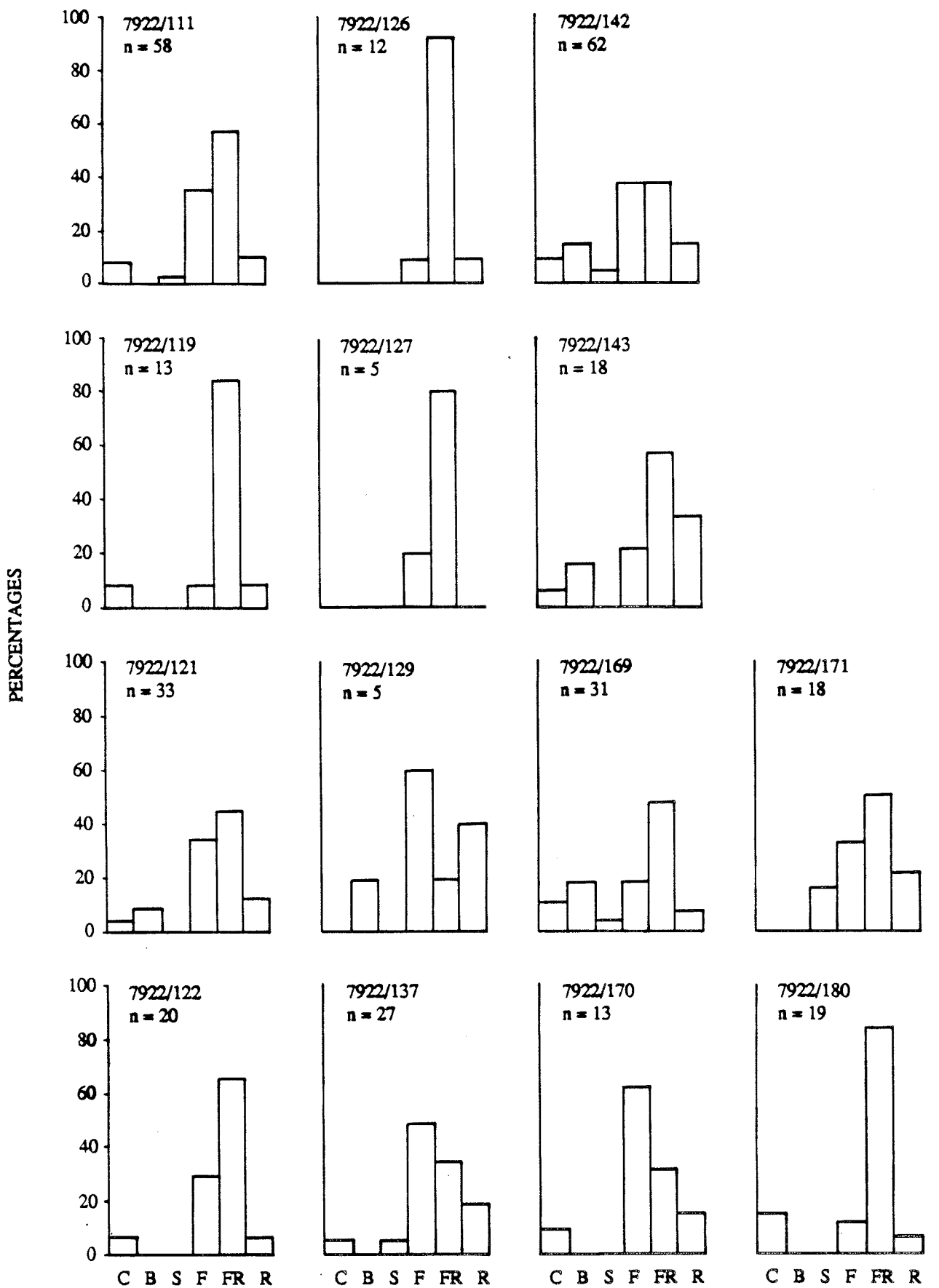
A substantial site (70 x 25m) is situated at "Carome" near Mernda, (VAS 7922/137) (Map 6). This is a moderate sized site (70 x 25m). It is perched high above the river on a tight meander. Its edges are eroding away but it seems most likely that there are undisturbed deposits at the site. A wide variety of tool types and raw materials were identified (Table 1 and Figure 3). The site is not used by animals or people so it is relatively safe from disturbance.

6.8 Raw Materials

Throughout the study area there were three important raw materials used for stone artefacts (Table 1). These are chert, quartz and silcrete (See Definitions in 5.2.2). The same materials were encountered by Presland (1977) in the Metropolitan area and by Hall (1987) in the Merri Creek Valley. Figure 2 shows the proportion of most rock types in a selection of sites which had enough artefacts (more than 5) to analyse. Numbers were often small and the analysis can only be considered preliminary. The proportions of the rock types for all the sites in the study area and for each landscape unit are compared in Table 3. Comparable figures from Presland (1977) and Hall (1978) are also included. There appears to be considerable differences in the proportions of raw materials found by each worker. This may be a real difference between areas. However, in the case of chert and silcrete, the discrepancy may lie in the definition of the rock types. For instance, a fine grained silcrete may be grouped with chert by some workers. The artefact scatters of the Plenty appear to have a high incident of chert and quartz compared with the Merri creek and Metropolitan areas.

6.9 Artefact Types

Figure 3 illustrates the proportions of artefact types in a selection of sites in the study area. There is a large proportion of fragments as would be expected in most artefact scatters. The frequency of retouched pieces, which is some measure of useable tools, ranges from 8-22% of any one scatter. The frequency of cores is 7% overall. Of interest is one large core (60 x 50 x 20 mm) found on the hills/uplands unit near Bridge Inn Road (VAS 7922/155). All other cores found were smaller. This may be because they were nearly spent and had been discarded. The large core may have been a new acquisition and little used.



KEY

C CORE
 B BLADE
 S SCRAPER
 F FLAKE
 FR FRAGMENT
 R RETOUCHEE PIECES

FIGURE 3 FREQUENCIES OF ARTEFACTS IN FOURTEEN SITES.

7. DISCUSSION

7.1 Introduction

In spite of the constraints inherent in this study, the sampling of landscape units has resulted in a considerable data base from which to build predictive models. There were obstacles to overcome apart from the ubiquitous scarcity of time and personnel resources available to carry out an extensive survey. The most difficult to overcome was the poor visibility of the ground surface. Without the presence of cultivated fields or a survey carried out at a different time of the year when the ground is more exposed by ploughing or the grass has died back, the chances of finding sites were greatly reduced. Furthermore, the processes of site formation are not yet well understood. This means for instance, that the extent to which sites are covered or uncovered by flood waters is not known. Although scarred trees are relatively easily spotted, artefact scatters are not and more intensive exploration such as test excavations or surface scrapes are required in order to be more precise about site types, dimensions and densities. Thus predictive modelling forms testable hypotheses which guide further enquiry.

It should be remembered that this study forms the first co-ordinated data base for the Plenty Valley and it cannot pretend to have all the answers. There is every reason to suspect that the Valley supplied many resources to support a community's needs and the evidence of the presence of a substantial population is so far undetected.

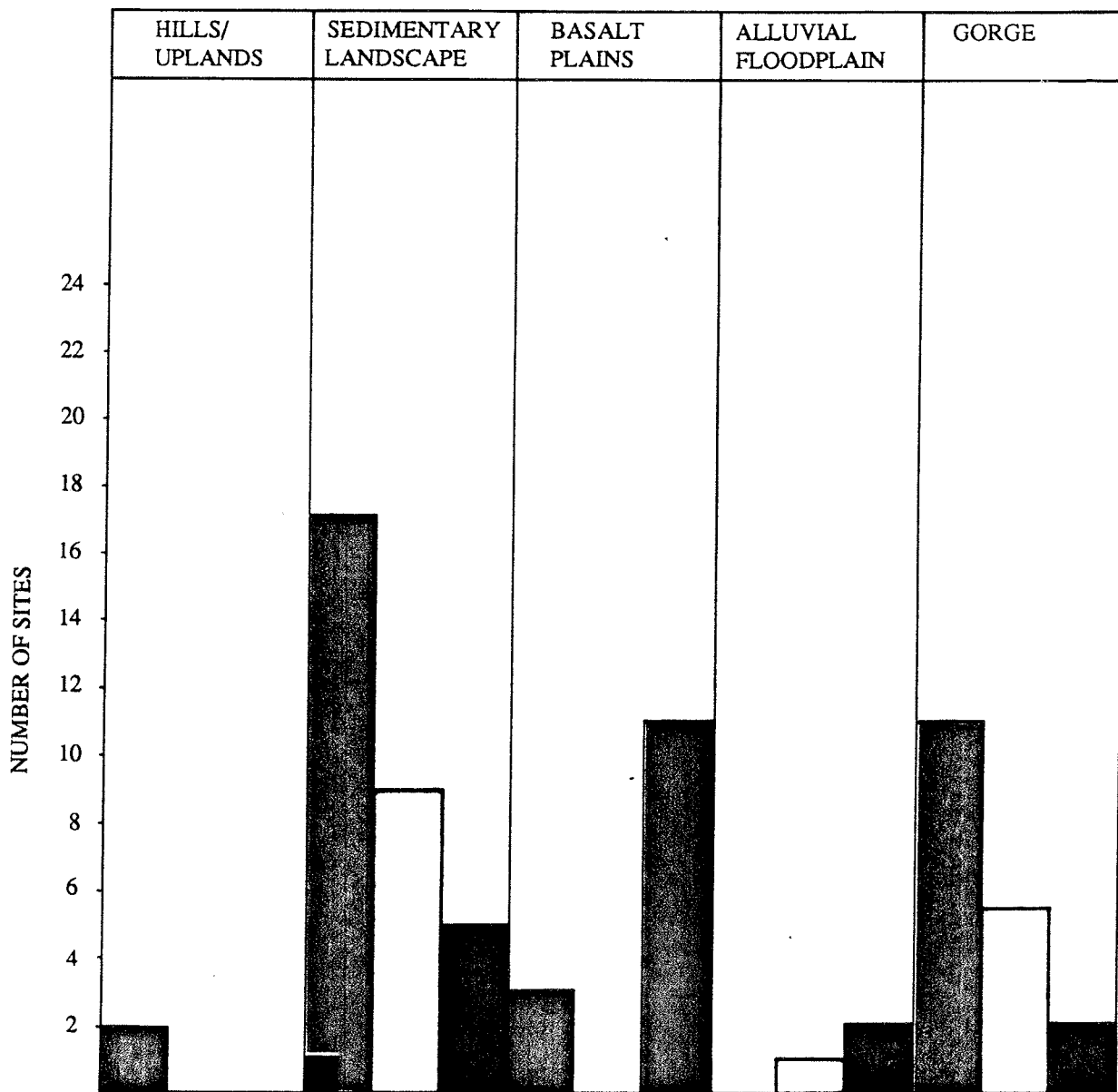
In order to be able to assign significance to the sites so that a ranking of importance and an assessment of management needs can be drawn up, they will be examined for intra- and inter- site variability. That is, the relative differences both within and between sites will be explored. This results in some understanding of site function, preservation, representativeness and age.

7.2 Intra-site Variability

As far as possible every artefact was inspected in order to identify its raw material, its morphology and whether it had been modified by retouch. Plates 17 and 18 illustrate just some of the stone artefacts examined. Figures 2 and 3 indicate the proportions of artefact types and raw materials used. Where possible, the proportions of retouched (or modified) pieces and cores to each total site assemblage have been calculated in order to attain some understanding of site function.

The variability of the artefact types allows some insight into the site function. For instance, a representation of most tool types and a relatively high number of total pieces suggests that the site was a general purpose campsite. This is illustrated by sites VAS 7922/142, /137, /143, /169, /121.

Specific functions are alluded to by higher than expected frequencies of certain components such as the distinct silcrete blade industry at site VAS 7922/142. Few of the blades showed any retouch and many were snapped. Microscopic analysis would be required to identify the use to which they were put and whether reasons for why so many were snapped was functional, accidental or ceremonial. Other activities went on at this site too, judging by the presence of many tool types and only a moderate incidence of cores. A high frequency of cores and fragments could signify a manufacturing of flakes for tool making. The favoured raw materials were silcrete and quartz.



KEY





-  ISOLATED ARTEFACT
-  ARTEFACT SCATTER
-  SCARRED TREE
-  STONE ARRANGEMENT

FIGURE 4 NUMBERS OF SITES IN THE FIVE LANDSCAPE UNITS.

Extending up the hill (into the sedimentary landscape unit) was another site (VAS 7922/143) which is clearly associated with the one on the alluvium just described. The hill site exhibits the same blade industry but a much higher frequency of retouched and used pieces (Figure 3). This site may have had more diverse functions; one tool had a denticulate or saw edge to it. Here silcrete did not have the same importance - chert was more common together with unusual materials such as a conglomerate. Whereas the silcrete and quartz artefacts on the previous site appeared newly made, many of the artefacts on this site were well used. This site therefore may be the remnant of a well frequented location to which different raw materials were brought for specific uses.

VAS 7922/121 at Blossom Park Pony Club is probably also a campsite. It has a diverse collection of tool types such as scrapers, hammer stones, grind stones, flakes and cores. But possibly, like the Janefield site VAS 7922/111, it was used for manufacturing stone artefacts as indicated by high frequencies of flakes and cores. Flakes are struck from cores and the presence of large numbers of newly struck flakes, a large quantity of fragmented debris and a high proportion of cores are indications of a manufacturing industry. (See Figure 3) Chert is easily the preferred raw material in both these sites, and may be derived from river pebbles or the creek banks.

Of the three major sites at Riverside, VAS 7922/169 shows a preference for quartz as a raw material. Although it is rather difficult and unpredictable in its flaking qualities, it is a hard material which is strong and durable. It seems that flakes were being made and used here and the cores discarded. Many tool types suggest a site of diverse activities. Flakes were used as points in spears. Scrapers were used on wood and animal skins. Artefacts with sharp edges were used to cut up meat. These were all activities that went on in a well-used campsite. VAS 7922/171, also at Riverside, may be the eroding remnant of another camp site.

Riverside 3 (VAS 7922/170) this appears to be a single event where a tool maker has reduced a core into a number of good flakes and fragments. None that were left on the site have been retouched or formed into formal tools. All are silcrete and to fit the pieces back together to form the original core would provide insight into the flaking technique. Together with this assemblage are four scrapers of old glass. In contrast to the silcrete flakes, these have been extensively retouched to both strengthen the cutting edge and blunt the holding side. The presence of this glass (another glass scraper was found less than a kilometre away VAS 7922/172) indicates that Aboriginal people were living at Riverside after the contact period.

Other campsites in the study area contain just flakes and fragments with an occasional tool or core (VAS 7922/126, /119, /180, /127, /122). This may be because most of the site has been eroded away or that most of it is still concealed under sediments. Or it may be that these are transient stops or where other activities have left no trace. Artefacts made of organic materials were common but they disintegrate quickly and many activities remain unrepresented.

Most of the sites located had a degree of disturbance which makes the assessment of spatial patterning within sites difficult to carry out. Although some activities such as stone tool manufacturing can be identified, it should be remembered that innumerable activities are unrepresented because they leave no trace. All the artefacts examined appear to belong to the Small Tool Tradition which dates from about 5000 years ago to the present in S.E. Australia.

7.3 Inter-site Variability

The artefacts that have been found scattered throughout the study area and on all landscape units represent an occupation by Aborigines for probably thousands of years (See Map 6). The "background noise" of discarded artefacts - sometimes as isolates, sometimes as two to four artefacts at a transient stop, is part of the evidence for this. The campsites represent the focus of activities of the daily and seasonal patterns of subsistence. Sometimes, these patterns can be translated into specific functions. For instance, sources of good flaking stone can be associated with a quarry site and may be a manufacturing site. So when one of these is located, the others are looked for. In terms of the landscape units, the evidence from the site types can provide information about how that unit was utilised.

Figure 2 and Appendix 5 show the proportions of raw materials in sites. Chert is the preferred material in the sites of the southern Gorge and Yarrambat. This is not surprising since chert is a material associated with sedimentary strata. It may be found as nodules or as river pebbles. Silcrete takes over from chert in frequency in sites further north and west of the Plenty River. See Figure 2. Again this is predictable in that silcrete can be formed by pressure and heat of basalt on siliceous rocks. The Gorge, and its west bank in particular is an obvious place to find this phenomenon. However, no silcrete quarries were located. Quarry Hill is another likely source of silcrete deserving further exploration. Silcrete outcrops have been identified in several places west of Melbourne, in particular, Keilor, Broadmeadows, Thomastown and the Maribyrnong Valley (John Webb pers. comm.) where similar geological conditions occur. The Donnybrook Road site (VAS 7922/143) lies at the interface of the basalt and sedimentary rocks and the raw materials show equal proportions of chert and silcrete.

This apparent distinction between the west and east banks of the Gorge may suggest that the Gorge tended to be a cultural barrier. That is, - people on their respective sides tended to look to their own hinterlands for sources of raw materials. However, it was clearly not a complete barrier.

Quartz as a raw material is almost ubiquitous. Although, it is found in sedimentary rocks and not in the basalt, it is found as isolated artefacts on the basalt. This may imply that its robustness as a material is preferred over chert and silcrete for certain tasks.

A smattering of other materials was found in the form of basalt for hammerstones and modified flakes (VAS 7922/121, /137). A siltstone - which is similar to chert, was a rare find (VAS 7922/121).

7.4 Scarred Trees

Most of the scarred trees (thirteen) were found on Red Gums on the basalt plains. All the scars were small to moderate in size - less than 3m long. Thus none were "canoe trees". The bark has probably been removed for making shields and containers. There was one example of bark having been removed as a large slab - possibly for making a shelter (VAS 7922/183). Plates 12 to 16 give some idea of the variety of scars.

Nine scarred trees were found on landscape units other than the basalt. Three of these are Red Gums and the rest are Swamp Gums, Manna Gum or Box Gum. The tree in the Gorge unit is probably a Box Gum (VAS 7922/116).

All the trees bearing scars are old. The Red Gums have girths usually over 4m, though the scarred tree in the Gorge is less than 3 metres. It is likely that with the disruption of their social life and their gradual movement away from the valley with the advent of European agriculture, Aborigines stopped cutting the bark from trees around the middle of the last century. This makes the youngest scars well over one hundred years old.

The Red Gums were a much sought after timber in the Valley in the last century. Splitters worked relentlessly to supply timber for all sorts of construction in the valley and in Melbourne. Although the Red Gums were probably always only an open woodland, much of the original stands have been decimated. With this have gone innumerable scarred trees and the ones that are left are obviously only a fraction of what was there originally. So they have become an uncommon site in Victoria (excluding the Murray Valley) and now twenty two such sites have been recorded in the Plenty Valley corridor.

Figure 4 illustrates the numbers of each site type on each of the landscape units. Table 1 demonstrates the density of each site type by landscape unit. Most scarred trees were found on the basalt plains and indeed the predicted density for site type on the basalt is 43 per km².

The alluvial flood plain also indicates a high density of scarred trees (33 per km²) although only two were actually located.

The sedimentary landscape and the Gorge are predicted to have 13 and 10 per km² respectively. The likelihood is that these trees will not be Red Gums.

The visibility of the ground has no bearing on the ability to locate scarred trees. Visibility is calculated at 100% since within an intensive survey of a sample area, all scarred trees are visible and will be located.

The site density of scarred trees is likely to reflect the true distribution within and between areas since Red Gums were a favoured bark for utilization and Red Gums grow almost exclusively on the basalt and near natural watercourses. Thus the densities for scar trees are higher on the basalt and the alluvial flood plain than the sedimentary landscape and Gorge. The hills have no trees left on them.

The scarred trees on the basalt are often far from permanent water, but those on other units were usually within 500m of permanent water. This distribution could reflect the fact that large stands of Red Gums survive on the basalt and in areas close to the Plenty River which become inundated and choked with vegetation. These are the areas where the old scarred trees are likely to survive.

The very high densities predicted for some landscape units are likely to be inflated as a result of the small sample size of the areas surveyed. Larger areas would bring down the density and possibly alter the inter-unit distribution, though the latter seems unlikely.

It is rather difficult to reconstruct the scarred tree density at pre-contact time. Certainly there were more trees and therefore more scarred ones. It would seem from present distribution that all landscape units except perhaps the hills, had scarred trees. Most probably the density of scarred Red Gums was greater in the past since it is predominantly they which have been cleared, and the trees in the Gorge, along the riparian (river) strip and parts of the sedimentary landscape that have escaped clearance.

8. CONCLUSIONS

A picture of Aboriginal life in the Plenty Valley begins to emerge from observations of the archaeological, ethnographic and environmental evidence of this survey. Aborigines have lived in the Plenty Valley for at least up to 5000 years. They have utilised all parts of the Valley for varying amounts of time and various purposes.

The hills to the south and west of Whittlesea were probably used as a transit route down the Valley. Aborigines left a random pattern of discarded artefacts on their travels. Until well into this century, Banksia and She Oak trees grew on the hills (Cameron Beardsell pers. comm.) These trees, in their own ways, are fire tolerant species that survived the firing regime which Aborigines used to keep such routes free of thick vegetation (Gaughwin, Ranson pers. comm). The ridge provided a good vantage from which to observe environmental information such as the presence of game, in the Plenty and Barber's Creek Valleys. But it was also a route that saved them from more difficult and hazardous passage through swamps and thicker vegetation at lower altitudes. The high density of isolated artefacts predicted for the hills suggests a steady long term use of this unit. Quarry Hill is a southerly outlier of the ridge and it may have provided a useful source of flakeable material along the way or was even a destination. A survey of the hill should be conducted to look for sites, especially quarries. It is out of the corridor area and was not included in this survey.

The basalt plains, where no major artefact scatters were found, may have attracted Aborigines on foraging trips. No fish traps or stone houses were found which might point to more permanent occupation. But mounds have been reported in the ethnographic literature (though not found) which could have formed more permanent bases. Certainly people used the plains a great deal. The Red Gums were targetted for their bark from which Aborigines made several items. A high density of scarred trees can still be expected.

The Red Gums were also a source of 'lerp' - a sweet exudate on the leaves much liked by Aborigines who would make special trips to collect it when it was available.

The open woodland with grass understorey afforded an excellent environment for kangaroos and wallabies and the yam daisy (with its nutritious tuber) grew in abundance.

The basalt plains however, lack fresh running water which was an important criterion for a good campsite. In wet weather the basalt becomes inundated and marshy and dry places to camp are infrequent.

The sedimentary landscape on the other hand, contains many creeks. Large artefact scatters are the evidence of past campsites set up on high spots close to creeks or the Plenty River. The sedimentary rocks are also a source for raw material - chert and quartz. The thicker Manna and Box Gum forests would have been a different environment to the Red Gum Plains and supplied different plant and animal species for food. Judging by the greater number of campsites in this unit, it was the preferred terrain for base camps.

The alluvial floodplains, being often swampy, would have been a source of many food resources for hunter gatherers. Ryder's Swamp, before it became the Yan Yean Reservoir, would have teemed with wildlife and had convenient high ground vantages around it. The ethnographic record notes Aborigines using this part. The wetter places also provided melaleuca for spears. Triglochin and Typha (water plants) also grow in these wetlands. Both are food sources, and Typha fibres can be made into string which can then be made into nets and bags. Red Gums grew by the creeks, too, and scarred ones can be expected where they survive.

Although the wetter parts of the alluvium were not conducive to camping, it is clear that there must have been drier spots where people did camp - perhaps for a specific reason. The Donnybrook Road site with its important blade industry is an example of where people occupied a site on the alluvium presumably at a dry time of the year.

The Gorge itself was probably not a place where people camped. However, there are several accounts of caves and rock shelters in the sedimentary banks. Some of these were above flood level, though it is unlikely that they were inhabited for any length of time, if ever. The Gorge provides a source of fresh running water and of birds and fish. Where the basalt tops the sedimentary strata, people could find outcrops of silcrete to exploit.

Before the Yan Yean reservoir was created, the Plenty River carried a much greater volume of water which made it navigable by canoes for many sections. Therefore, trees with canoe shapes cut out of their bark can be expected especially where access is easier such as north of the Gorge. The Gorge would not have been easily traversed by foot. The fact that it was an important focus for Aborigines is attested to by the density of substantial artefact scatters along its rim and on spurs between meanders.

The seasonal pattern of resource exploitation that has probably been going on for some thousands of years in the Plenty Valley is not yet clear. But the data collected to date includes tantalising clues to the different uses of the landscape units. Further intensive work is required to test the hypotheses put here that people occupied the sedimentary landscape in the long term and made sporadic or seasonal trips for different resources on the other landscape units. The hills were probably kept reasonably free of dense vegetation so that a transit route was kept open.

9. SIGNIFICANCE OF SITES LOCATED ON THIS SURVEY

9.1 Introduction

Sites are assessed for significance in terms of their scientific Aboriginal and social values. Sites may be significant on the basis of one or more these categories. For instance, a site may have cultural significance to an Aboriginal group and be low in importance to archaeologists and sites which have high scientific significance may also be very important to Aboriginal people.

9.2 Aboriginal significance

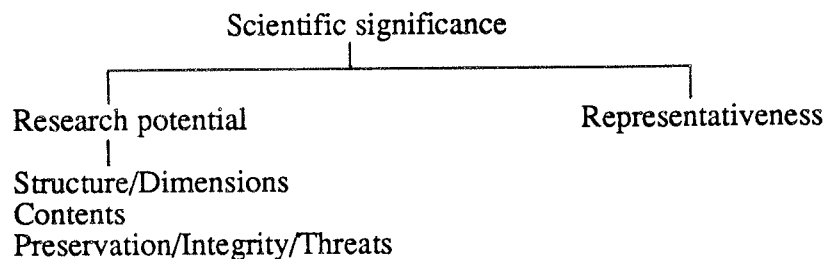
Discussions with Aboriginal communities indicate that all Aboriginal sites are of importance to Aboriginal people, in particular those sites within a community's tribal area.

They perceive these physical manifestations as important links with their past. Societies everywhere place an importance on their history and the sense of belonging, identity, continuity and stability which that creates. For Aboriginal people, facing great cultural losses, and the absence of a written record, archaeological sites are tangible evidence of their past which can be used to instruct both Aborigines and the white community. However, Aboriginal communities today also understand the competition for limited land and financial resources and have formed a ranking of site importance. Burials and ceremonial sites are of very high importance. Large sites and scarred trees are also high in importance as are sites from the post-contact period such as massacre sites. Other post-contact sites (those containing aspects or items of European culture such as mission sites or artefact scatters that contain flaked glass and metal) have historic as well as Aboriginal significance.

What is important therefore, is that Aboriginal people and not archaeologists are the ones best qualified to determine the Aboriginal significance of a site. The cultural values that give a site Aboriginal significance may be quite different to the values adopted in assessing scientific significance. Therefore, the appropriate Aboriginal community must be consulted each time the Aboriginal significance of a site has to be evaluated. This consultation process is becoming part of all archaeological surveys carried out in Victorian through VAS.

9.3 Scientific Significance

For a site to have scientific significance it must possess the ability to answer timely and important scientific questions. This can be demonstrated through the assessment of the following parameters.



The ability of a site to answer research questions may be evaluated by examining its structure, contents and preservation. The structure of a site pertains to whether it has a depth of occupation layers and what its internal patterning may be. This can provide insight into changes over time. Its dimensions have a bearing on a site's ability to provide ample sample sizes.

The contents of a site are the residue of activities of Aboriginal people at that place. The variation seen in the contents can be useful in determining the functions and age of the site, as well as changes over time.

The presentation of site integrity with regard to its structure and contents influences the accuracy of data derived from it. Unfortunately, sites are often discovered when they become disturbed by threats such as soil erosion, road and building construction, but they may also retain important undisturbed (*in situ*) deposits. Such sites are becoming a limited resource because of their destruction by farming activity, urban and industrial development and natural erosion.

Representativeness is based on the known sites in the region. Clearly, this will depend on the extent to which the region has been surveyed and therefore as more work is carried out so the site representation will change. Where an area has been intensively surveyed, a more accurate regional representation and fuller picture of the regional settlement pattern becomes possible.

This survey could only hope to provide the first overview of the Aboriginal use of the Plenty Valley in that landscape units were sampled and the sites located can therefore only be a sample of what is actually present.

This means that with the state of knowledge at present, all of the sites located on the survey will have a regional significance because they can answer questions on site location, land use patterns and intersite patterning. Further work will be required to fine tune and re-evaluate this initial interpretation.

Representativeness of sites is also affected by the durability of the site and its contents as well as the selective distribution of some site types. Scarred trees for instance, being organic, have a limited life expectancy and are also prone to selective clearance of trees from paddocks. Surface scatters of artefacts have been and will continue to be disturbed and destroyed by ploughing but those sites in more inaccessible locations are more likely to be preserved.

Finally, an evaluation of representativeness must take into account that some site types are uncommon in the first place. Very few examples of axe-grinding grooves, ceremonial stone arrangements and quarries are known in Victoria, let alone on a regional scale. There are no known examples of rock art within 200 km. of Melbourne which probably reflects the lack of substantial shelters where they might be preserved as well as their rarity.

Representativeness therefore, pre-supposes a regional significance of the site which in turn is based on that assessment of the site structure, contents and preservation. Sites found on the survey which have a low frequency should be preserved on account of their rarity even if this may change with subsequent work. A good sample of apparently common site types (such as artefact scatters) should also be retained until further work can establish the meaning of intra - and intersite patterning of sites located on several landscape units.

Table 3: Criteria for assessing the significance of sites found on the survey

Preservation	H	- a site in excellent condition, little disturbance, in situ deposits
	M	- some disturbance, some of artefacts not in original position
	L	- site in poor condition, considerable erosion and loss of contents
Contents	H	- usually large number of artefacts, variable site size but having considerable research potential
	M	- possibly small site, less contents, less research potential
	L	- small site with disturbance of contents, low research potential
Structure	H	- having evidence of stratification
	M	- possibly surface scatter with possible stratification
	L	- open site, possibly disturbed, having no stratification
Representativeness	H	- Rare site, possibly of great age (>10,000 years)
	M	- Uncommon site
	L	- Common site type
Aboriginal	H	- Sacred, secret, preserved at all costs
	M	- Important site, high priority
	L	- Low priority
Educational/Social	H	- very appropriate, possibly high scientific and Aboriginal significance, usually on public land
	M	- Medium potential for education/recreational use
	L	- inappropriate for public educational use
Threats	H	- No threats to site integrity
	M	- a number of potential threats, though not beyond mitigation
	L	- active erosion of site

Table 4: Rating of significance for all the artefact scatters, the grave and the scarred trees

	Preservation	Contents	Structure	Representative-ness	Aboriginal	Educational/Social	Threats
7922/111	M	L	L	M	M	H	M
119	M	L	L	M	M	L	M
121	M	H	M	H	H	H	M
122	M	M	M	M	M	H	L
126	L	L	L	L	M	M	L
127	L	L	L	L	L	L	L
129	M	L	L	L	L	L	M
180	M	L	L	L	L	L	M
137	H	H	H	H	H	M	M/L
169	M	M	L	L	M	H	H
170	L	M	L	L	M	H	L
171	H	M/L	L	H	H	H	L
142	H/M	H	M	L	M	M	L
143	L	M	L	H	H	H	M
116	H	H	-	L	L	M	L
123	H	H	-	H	H	H	L
182	H	H	-	H	H	H	L
183	H	H	-	H	H	H	L
136	H	H	-	H	H	H	L
138	H	H	-	H	H	H	L
140	H	H	-	H	H	H	L
141	H	H	-	H	H	H	L
146	H	H	-	H	H	H	L
147	H	H	-	H	H	H	L
149	H	H	-	H	H	H	L
150	H	H	-	H	H	H	L
151	L	H	-	H	H	H	L
153	H	H	-	H	H	H	H
154	H	H	-	H	H	H	L
158	H	H	-	H	H	H	L
161	H	H	-	H	H	H	L
164	H	H	-	H	H	H	L
131	H	H	-	H	H	H	L
152	H	H	H	H	H	H	L
125	M	M	M	M	M	H	M
112	L	M/L	L	L	L	M	L

9.4 Social, Educational and Recreational significance

Some sites lend themselves to interpretation for tourists, school groups and the wider community. The use of sites in this way is being carried out with the Grampians, Aboriginal rock art shelters and the stone houses and fish traps at Lake Condah in the Western District. These sites are of high scientific and Aboriginal significance. However, other sites, on account of their poor preservation, small size or lack of stratified deposits may have a low scientific significance. These are put to best use as interpretive focii in public open spaces or through the collection of the artefacts and their placement in Aboriginal Keeping Places for education purposes.

Social significance is assessed from the point of view of how appropriate and useful is a site for this function. Firstly, it is important to remember that the use of a site for public education involves a pressure of visitation, the risk of loss of artefacts and therefore the deterioration of the site. Furthermore, the National Museum of Victoria is already overburdened with collections of artefacts and the accumulation of more is undesirable. Therefore, a site needs to be able to withstand public visitation and management strategies should be carried out beforehand. A site can be considered educationally or recreationally useful if it contains enough information, similar sites exist which can be conserved or when salvage is the optimal management strategy for the site.

Secondly, then, with a few exceptions, sites that are rare, of high scientific or high Aboriginal significance are generally not appropriate for consideration as sites for social use. Exceptions include Grampians rock art sites and the Condah stone arrangements. Generally, sites of high scientific significance are too valuable an asset to put at risk and sites of an Aboriginal secret or sacred nature are inappropriate.

9.5 Significance of sites found on this survey

Table 4 gives an indication of the relative significance of the sites located. Whereas all sites and isolated artefacts are important from the point of view that they are a limited, non-renewable, fragile resource; we assign levels of significance so that we can actively preserve the most important sites and a representative range.

Since no previous documentation of sites has been carried out in the Plenty Valley, the regional context of the sites located on this survey is important. Thus, these sites will have a strong regional significance until they can be reassessed as the regional resource is further explored.

Sites have been assessed in a systematic manner. Table 3 is the key to the way in which certain criteria were evaluated and placed into high (H), medium (M), or low (L) significance levels.

Idiosyncratic characteristics are encompassed by the individual assets of a site such as the unusual assemblage of artefacts or the presence of more than one scar on a tree or the social and sacred nature of the grave. Some subjectivity is inevitable in the evaluation of site significance but this is based on experience of the archaeologist and on discussions with other archaeologists at VAS.

Significance can be assessed from the point of view of individual sites and that of their contribution to zones of archaeological sensitivity.

9.5.1 Scarred trees

All these are highly significant from the viewpoint of scientific and Aboriginal criteria. As archaeological sites they are relatively rare. They are important to archaeology because they contain a wealth of information about the material culture of pre-contact Aborigines. Because of their organic make-up, they have a finite life expectancy and are difficult to preserve with present technology. A systematic study of the archaeology of scarred trees is long overdue (but see Beasley's unpublished report to VAS).

For Aboriginal communities scarred trees can be highly significant for their educational value, symbolism and as a community asset. The Red Gums of the basalt plains are the representative focus of this site type.

9.5.2 Isolated artefacts

These form the extensive "background noise" of Aboriginal occupation of the Valley for a considerable period of time. They have significance in that they delineate the use of the landscape but because of their wide dispersal they cannot be completely protected but their documentation is the best that can be hoped for. Of all the site types located in the Valley, they are therefore the least important in archaeological and Aboriginal terms.

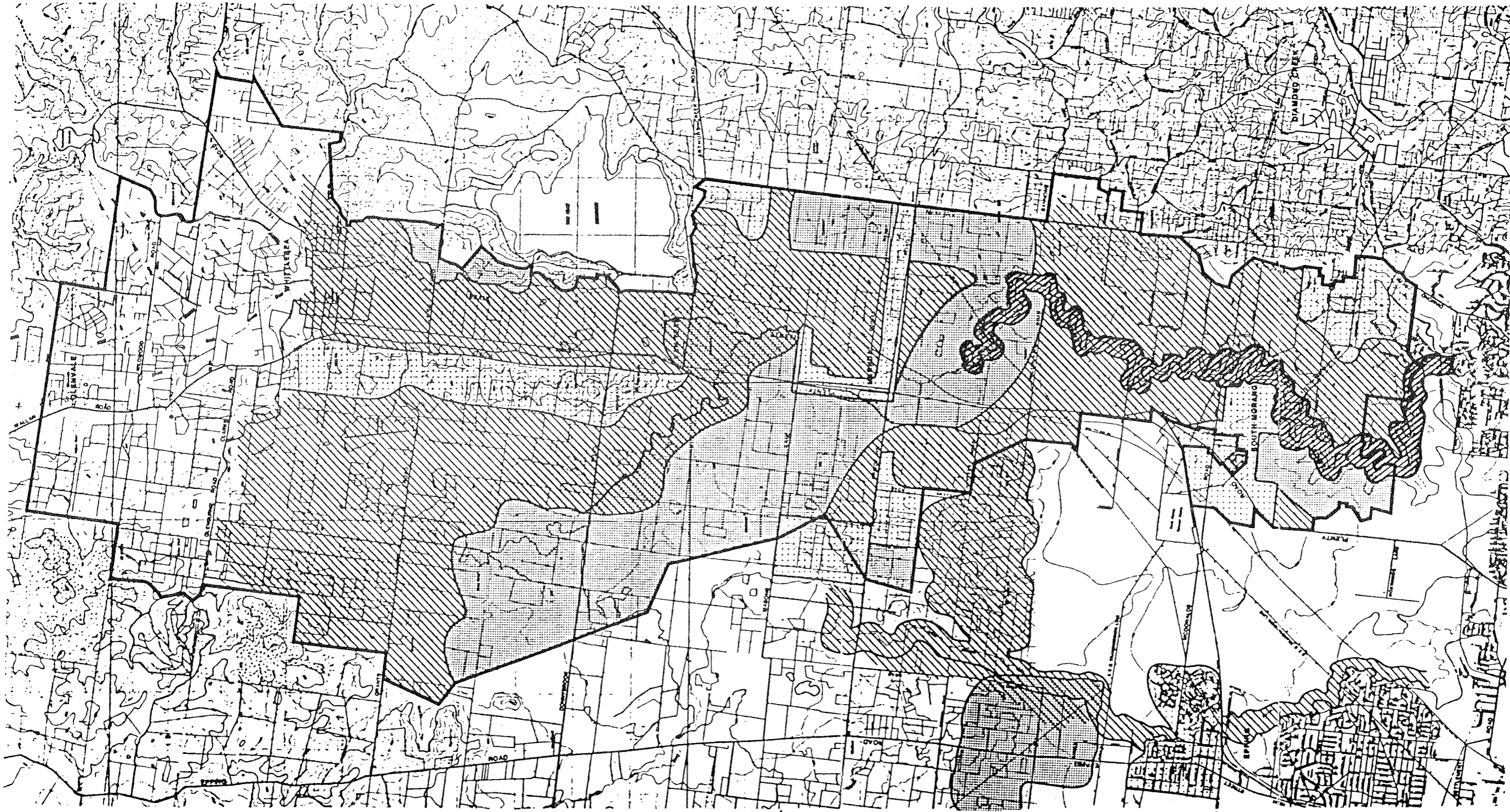
9.5.3 Artefact Scatters

These are very important sites because they potentially contain a large and diverse body of information which can be used to address research questions pertaining to pre-contact economy, land use and resource exploitation, spatial patterning of sites and much more. This information can pertain to the particular site and the uses to which it was put, and the regional context of settlement pattern.

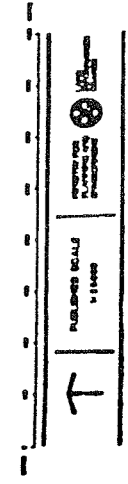
Artefact scatters, by common definition adopted in this report, contain at least five artefacts in a five meter radius. As a general rule however, the larger the site, the more information it probably contains. So, larger sites are considered more important and worthy of special protection measures and management strategies. But to be significant, (capable of answering scientific questions, for instance), a site has to have other characteristics. Those sites that have undisturbed, stratified deposits would rate a very high scientific significance rating. Large artefact scatters may also have a high Aboriginal significance and the potential to be incorporated into educational/interpretative schemes.

It is therefore important to conserve a representative sample of each type of artefact scatter and especially those with stratified deposits and undisturbed contents.





Not many artefact scatters have so far been located in the corridor. It could well be that many have already been destroyed during urbanisation and family practices. In fact, the presently known distribution of this site type is confined to the sedimentary landscape and the gorge. The inter-site variability is not yet known and further work would be required to define the differences between artefact scatters.



PLENTY VALLEY STUDY



Zones of Archaeological Sensitivity

-  Very High Archaeological Sensitivity
-  High Archaeological Sensitivity
-  High Archaeological Sensitivity for Scarred Trees (Red Gum)
-  Low Archaeological Sensitivity

10. RECOMMENDATIONS

10.1 Introduction

The aim of these recommendations is to identify the land management strategies for sites and to establish zones of archaeological sensitivity. Management strategies must take into account the significance of sites and also the need for further archaeological work including surveys and research.

This section will work from the general to the specific in that the zones of archaeological sensitivity will be explained first followed by the identification of specific significant sites. The following sections should be read in conjunction with map 7.

10.2 Recommendations for Zoning

The patterning of site distribution over the five landscape units has been used to construct a predictive model for those areas not intensively surveyed. These are depicted in Map 7. With the use of this model the types and locations of sites that are likely to be disturbed by urban development can be anticipated. The landscape units therefore, can be used as the bases for establishing zones of high to low archaeological significance as shown on Map 7 in conjunction with MPE planning zones.

10.2.1 The Gorge

This is a zone of high archaeological sensitivity. It has a number of significant sites associated with it, a high site density and the potential is there for locating other site types. Although most of the Gorge including the Yarrambat Metropolitan Park, will be incorporated into a park zoning, it is important to remember that the Aboriginal use of the Gorge appears to extend up to 1000m on either side of the River between Greensborough and Bridge Inn Road.

Recommendation 1.

The survey has served to produce a preliminary overview of the archaeology of the Plenty Corridor, therefore it is strongly recommended that a more comprehensive study be carried out in the Gorge area as soon as the Plenty Gorge Metropolitan Park has been created. This should include the Yarrambat Metropolitan Park. This will create a better data base from which to establish Park policy for the specific management of sites.

Recommendation 2

On the completion of the above study, a number of appropriate sites can be identified which will best serve the purpose of providing an interpretive centre or focus for public education.

Recommendation 3

Sufficient sites exist in the Gorge area for a pamphlet to be created that can explain the Aboriginal occupation and use of the Valley.

It is very important that the study specifically address the issue of how these educative sites are to be protected before the park grounds are upgraded and greater visitation by the public is encouraged.

Recommendation 4

It is therefore recommended that the Shire Council and MMBW carry out no activities involving ground disturbance such as landscaping, trenching or building, without prior archaeological examination and consultations with the appropriate Aboriginal community.

Recommendation 5

No permit to disturb the ground within the Gorge unit should be issued for any development by a private developer prior to an archaeological survey.

Since the MMBW will administer the Park, it will be responsible for the induction of this study, but VAS will act in an advisory role if this is required.

10.2.2 The Sedimentary Landscape

This has been shown by the Survey to have the highest site density of artefact scatters other than the Gorge unit. This is therefore the next most sensitive landscape unit. Note that the 800m of sedimentary landscape immediately abutting the Gorge unit is most sensitive and is included in an extended Gorge Zone outlined in 10.2.1 above.

Recommendation 6

All requests for permits to develop areas greater than 5 hectares within this unit should require an archaeological survey to be carried out first.

10.2.3 The Basalt Plains

The pattern of distribution of sites indicates an intermittent and purpose specific use of the basalt plains by pre-contact Aborigines. One specific purpose was the procurement of bark from the Red Gums for the manufacture of certain items. This unit displays a high density of scarred trees and a meagre scatter of isolated artefacts.

Recommendation 7

It is recommended that study of scarred tree types and distribution be carried out in the last remaining stands of old Red Gums since the resource has a finite life expectancy and such a study is long overdue. This study could be instigated and funded by the Shire Council.

Recommendation 8

It is recommended that no Red Gums be cut or removed prior to inspection by an archaeologist. This is a responsibility of the Shire Council.

10.2.4 The Alluvial Floodplain

This unit is predicted to have a density of 69 artefact scatters per km². Although Aborigines would have made extensive but transitory use of resources in this unit at any time of the year, seasonal camps would have been possible in some places where the land dried up in summer. This could explain the important site at Donnybrook Road. An efficient means of combatting the wet ground was to build earth mounds. These have been reported in the literary sources and were said to occur on the Darebin Creek and Plenty River. Apart from scarred trees, sites on this unit are exceedingly difficult to find for reasons mentioned previously. For instance, the sediment deposition and scouring action of flooding is not well understood nor therefore how archaeological sites are affected. It is most likely that artefact scatters on the alluvium will only be exposed by ground disturbance.

Therefore, the monitoring of ground disturbance aims to gain information about the site distribution on this unit and to identify special and significant sites that require protection.

Recommendation 9

It is therefore recommended that VAS be notified of large scale ground disturbance such as might occur during large urban developments, landscaping, trenching by MMBW and Telecom. The ground area that this pertains to is:

- . A linear area of 500m or more
- . An area of 5 Ha or more

The best surveillance method for detecting sites on the alluvium unit is for VAS agents to monitor the ground disturbance as it occurs.

Recommendation 10

Red Gums grow close to natural watercourses so an inspection of these trees and indeed other large and old gums such as Manna Gums and Swamp Gums should be a pre-requisite of a permit granted to clear trees.

10.2.5 The Hills/Uplands

The part of the corridor north of an East/West line through Whittlesea was not surveyed during this survey for reasons outlined in Section 5.1 Most of this part consists of alluvial floodplain.

Recommendation 11

It is recommended that the Whittlesea Shire initiate a survey of this area to complete the study of the Plenty Valley and its tributaries. A pamphlet outlining the prehistory of the Valley could then be drawn up for public consumption.

The prediction for this unit is for a high density of isolated artefacts and not for large and significant artefact scatters or scarred trees. The transitory use of this steeper ground, although important in the overall settlement pattern of the valley, is rated as low in terms of archaeological sensitivity. Therefore, no specific recommendations are put forward for the management of sites on this unit.

10.2.6 Built-Up Areas

There are a number of areas which are already disturbed to such an extent by urban development as to have possibly reduced the value of archaeological sites present. However, some sites can be salvaged or used for educational purposes. Where they have been identified, sites can be incorporated into semi-urban settings for example, the way in which scarred trees at the Phillip Institute and the silcrete quarry at the Bundoora Golf Club have been incorporated into open spaces. A specific management policy for their continued protection however, should be in place or set up if this is not the case. The VAS can advise on these matters and councils and other institutions should be aware of the legal protection afforded to Aboriginal archaeological sites.

Small subdivisions within built-up areas will probably have few consequences for most archaeological sites since most would have been badly damaged if not totally destroyed. However, large subdivisions in areas abutting most urban areas may support numbers of archaeological sites that have not been disturbed nor even discovered. A case in point is the substantial new subdivision at Riverside property in South Morang where eight sites were documented. Janefield Training Centre and Blossom Park Pony Club are two more areas adjacent to urban development and indeed on which there has been much activity that disturbs the ground surface. Fourteen archaeological sites were located on these two properties.

Recommendation 12

It is recommended that permits for all new large subdivisions (>5Ha) which will be extensions of existing urban areas be preceded by a survey for archaeological sites.

Recommendation 13

It is recommended that the Shire Councils be made aware of specific sites in their jurisdiction and that they seek advice from VAS as to the best management strategies for the protection of those sites.

10.2.7 Areas beyond the current study

Extensive basalt plains join the Plenty Corridor. The predictive model set up by the survey can be extended beyond the corridor if the same geological and topographic conditions prevail.

In this survey, no artefact scatters that were Aboriginal campsites were found on the basalt plain. Evidence from du Cros's Study of the Western Melbourne Metropolitan Region (1989) supports this finding. But where creeks cross the basalt or there are raised hills created by volcanic eruption points and where there are swamps, du Cros did find substantial sites. Aborigines focussed at these points because of the resources they offered. Du Cros found that the artefact scatters were usually within 200m of natural waterways, close to swamps or on top of eruption points.

Hall (1987) in his study of the Merri Creek also found sites on the rim of the Barry's Road Gorge and close to the Creek.

Particularly sensitive areas are as follows:-

1. Within 200m of any natural watercourse such as the Merri, Darebin and Edgars Creeks, and their tributaries.
2. In the vicinity of and especially on high ground close to swamps. Such areas may be identified today as areas prone to inundation and may now be artificially drained.
3. Volcanic eruption points. From the Melbourne 1:250,000 Geological map no such eruption points are identified in the Epping area though this may have to be substantiated by field work.
4. In line with the rest of the basalt plain, it is anticipated that some Red Gums that survive may well have Aboriginal scars on their trunks. Therefore, no permit to clear such trees should be granted prior to their inspection by a trained archaeologist.

Recommendation 14

Within the specific areas of high archaeological sensitivity, a permit to disturb the ground surface should be preceded by an archaeological survey. Ground disturbance can be caused by trenching, landscaping and road construction as well as urban development.

Recommendation 15

A survey should be carried out in the area of Quarry Hill in order to establish the Aboriginal use of the hill and to attempt to identify a source for silcrete procurement. This should be funded by the proponent seeking a development permit.

10.3 Recommendation for specific sites

Seventy archaeological sites were located during the survey. Their significance in scientific, Aboriginal and social terms range from high to low, but it is these sites that form the basis of the predictive model from which the zones of archaeological sensitivity were drawn up. This section will review specific site significance and propose measures for their management. The list commences with the most significant sites.

10.3.1 Glen Avon 2 (VAS 7922/152)

This site is located on private property. Oral tradition, passed on to the survey team, says that it is the grave of an Aborigine from the post-contact period. Discussions with the Wurundjeri Aboriginal community indicate that this site is of great significance to them. It is quite possible that the occupant may be traceable. It is also of high scientific significance as it represents a rare example of a known Aboriginal grave.

It is critical that the grave is not disturbed in any way. The land is not scheduled for development for some time and at the moment grazing animals are the only threat to the site. However, the stone arrangement which represents the grave is in a stable state. Discussions with the Wurundjeri spokesperson will continue so that the details of site management can be established.

Recommendation 16

It is recommended that a Heritage agreement is set up between the landowner and the Wurundjeri Tribe Land Compensation and Cultural Heritage Council. This is a provision set out in the Aboriginal and Torres Strait Islander Heritage Protection Act, 1984. It provides for the continuing legal protection of the site independently of the land changing ownership. The agreement aims to set out access rights to the site and recognition of the landowner's rights. VAS can act as the liaising agent in setting up communication between the parties.

Recommendation 17

It is recommended that the Wurundjeri Tribe Land Compensation and Cultural Heritage Council make a study of the oral traditions in the area that may throw light on the history and occupant of the grave.

10.3.2 Carome 1 (VAS 7922/137)

This large stratified site is on private land. The site is on the top of high ground on the inside of a tight meander of the Plenty River. It is a large site with evidence of undisturbed occupation layers under the surface and a wide variety of tool types and raw materials exposed by erosion. It is a site worthy of excavation if the opportunity arises in the future and information could throw light on such issues as intra-site variation and resource exploitation.

The edges of the site are eroding away possibly because of the loss of natural vegetation. There has been sand quarrying at one edge which may have caused a drying out of the hummock. No quarrying is carried now nor envisaged in the future. Animals, people and vehicles pose no threat to the site at present.

Recommendation 18

It is recommended that the landowner be told about this site and advised to participate in its protection by encouraging the growth of vegetation and keeping grazing animals off it.

Recommendation 19

The site would benefit greatly from mitigation measures to halt the progress of erosion of the northern edge of the site. VAS is the appropriate body to carry this out and to advise the landowner.

10.3.3 Donnybrook Road 1 (VAS 7922/142)

This site is located on private land. It has a high significance on scientific, Aboriginal and Educational criteria. It is probable that there are further undisturbed deposits and these may be stratified. The site has been exposed by the cutting of a new trotting track for the stud farm and the artefacts appear to be about 20 cms. beneath the surface. An important blade industry is implied by the number of such tools that were identified. This site has great research potential on the basis of its contents, size and the likely presence of undisturbed layers. It is worthy of excavation to address questions concerning the nature of the blade industry, the use of the alluvium landscape unit and pre-contact economy.

Recommendation 20

It is recommended that the landowner be told about the location of the site by VAS. It is likely that he will have spread a layer of sand over the trotting track by this time. This will serve to protect the artefacts on the track. VAS should advise the landowner to maintain the sand covering and to refrain from carrying out any further ground disturbance in the vicinity of the track.

10.3.4 Donnybrook Road 2 (VAS 7922/143)

This site is on the same private property as the previous site (VAS 7922/142). It has been exposed for some considerable time by the use of a farm track which leads from the new trotting track discussed in Section 10.3.3 above. It exhibits examples of the blade industry seen in the previous site as well as a number of retouched pieces and less common raw materials. The farmer will need continuing use of the track, but this will perpetuate the destruction of the artefact scatter and the deterioration of the artefacts. Since the track is on a hill slope, it is unlikely that a covering of sand will remain in place to protect the site. Because of the variety of tool types and raw materials, the artefacts could make a useful educational 'package' and the Wurundjeri have shown great interest in having such a collection for this purpose.

Recommendation 21

It is recommended that the artefacts of this site be collected off the track and given to Wurundjeri Tribe Land Compensation and Cultural Heritage Council for the purposes of forming an educational package. The task of collecting the artefacts can be borne by VAS and should only take approximately two days, including a short report.

10.3.5 "Riverside" sites

Riverside 1	(VAS 7922/169)
Riverside 2	(VAS 7922/170)
Riverside 3	(VAS 7922/171)
Riverside 8	(VAS 7922/131)

These four sites are on private property in South Morang. The three artefact scatters are of moderate significance mostly because they have varying degrees of disturbance. However VAS 7922/170 is a discreet assemblage of silcrete flakes possibly formed at a single event together with a small number of glass tools. This therefore dates the site to the post-contact period. It is important to remember that although old sites are less common which serves to increase their significance, recent sites are no less important because they too aid in the reconstruction of past lifeways.

Five other sites have been located on the same property:

Riverside 4	(VAS 7922/172)
Riverside 5	(VAS 7922/173)
Riverside 6	(VAS 7922/174)
Riverside 7	(VAS 7922/175)
Riverside 9	(VAS 7922/177)
Riverside 10	(VAS 7922/178)

All but the scarred tree (VAS 7922/131) are of low significance but contribute to the data on site distribution and the use of the area and the Gorge in particular.

A subdivision permit has already been granted for urban development to proceed. This was preceded by an archaeological survey of the property (Weaver 1989) and salvage collection of the artefacts from the sites was advocated. The recommendation for the scarred tree was that it should be incorporated into a public open space and protected.

Recommendation 22

It is recommended that VAS ensure that such recommendations that it approves are carried out.

10.3.6 The Plenty Gorge Metropolitan Park

Blossom Park Pony Club 7	(VAS 7922/121)
Janefield 2	(VAS 7922/111)
Janefield 3	(VAS 7922/112)
Blossom Park Pony Club 2	(VAS 7922/116)
Blossom Park Pony Club 9	(VAS 7922/123)

These sites are situated on what is currently private land. However, they will be incorporated into the area designated as the Plenty Gorge Metropolitan Park which will be administered by the MMBW. The first three sites are artefact scatters and the last two are scarred trees.

Site number VAS 7922/121 is an extensive site of moderate significance. It is significant because of its contents which include a variety of artefact types and raw materials. This has some research potential in that information from site contents can be useful to address questions on food processing and resource exploitation. However, it has been and still is being destroyed by sheet and gully erosion. It would appear that the grass has been removed for the procurement of the turf. As the site integrity has been lost, the contents can be used as an on-site educational focus if suitable management procedures can be put in train to prevent the worsening of the erosion by the planting of shrubs and grass on the lower edges to hold the soil, for instance, and to prevent the collection of the artefacts by visitors. The latter can include a programme of public education either through a static display in a centre or through a guided tour or personal supervision by a Ranger.

Recommendation 23

Site number VAS 7922/121 requires mitigation of measures to arrest the erosion of the site to be carried out by the Department of Conservation, Forests and Land (C.F.L.) with advice from VAS.

Recommendation 24

Site number VAS 7922/121 should be identified as appropriate for public education. When the site has been stabilized (see Recommendation 23), an interpretive on-site focus should be set up by C.F.L. with advice from VAS.

Recommendation 25

It is recommended for site numbers VAS 7922/111 and VAS 7922/112 that animal and vehicular traffic be kept off them to prevent further erosion of the sites and deterioration of the artefacts and to encourage revegetation.

Recommendation 26

Site numbers VAS 7922/116 and VAS 7922/123 are scarred trees. Measures should be taken to protect these and to incorporate them into the Park context with interpretive sign boards for public education. VAS can advise on both these matters but the responsibility lies with C.F.L.

Recommendation 27

It is recommended that the cemetery proposed for a location on the south side of Janefield Training Centre property be the subject of an archaeological survey prior to any ground surface disturbance during its establishment. The proponent (C.F.L.) should fund the survey.

10.3.7 Yarrambat Metropolitan Park

Yarrambat Park 2	(VAS 7922/125)
Yarrambat Park 3	(VAS 7922/126)
Yarrambat Park 4	(VAS 7922/127)
Yarrambat Park 6	(VAS 7922/129)
Yarrambat Park 8	(VAS 7922/180)

These five sites are artefact scatters of medium to low significance. They are located in the Yarrambat Metropolitan Park which is administered by the M.M.B.W. Site number VAS 7922/125 is a possible exception as it has a relatively greater number of artefacts, most in good state of preservation. It may be that the Wurundjeri Community may want the artefacts for their own Education needs in their keeping place.

Recommendation 28

It is recommended that these five sites be incorporated into a public interpretive walk within the Park. It is important that specific management measures are established to ensure that soil erosion is not allowed to worsen and that risk of collection of artefacts by Park visitors is minimised by some means such as guided tours by the Ranger or public education at an interpretive centre.

VAS can advise MMBW on how to achieve these goals and the MMBW should fund the project. Note that Recommendation 1 above points to the need for a comprehensive study of the Gorge area which includes the Yarrambat Metropolitan Park and the proposed, enlarged Plenty Gorge Park, all to be administered by the MMBW.

10.3.8 Scarred trees

Fenwick Park 2	(VAS 7922/182)
Fenwick Park 3	(VAS 7922/183)
Fenwick Park 5	(VAS 7922/184)
Bung Bong 1	(VAS 7922/138)
Bung Bong 3	(VAS 7922/140)
Bung Bong 4	(VAS 7922/141)
Coolamert 1	(VAS 7922/147)
Coolamert 2	(VAS 7922/147)
Mason's Lane 1	(VAS 7922/149)
Mason's Lane 2	(VAS 7922/150)
Glen Avon 1	(VAS 7922/153)
Mason's Lane 3	(VAS 7922/153)
Mason's Lane 4	(VAS 7922/154)
Plenty Road 1	(VAS 7922/158)
Ashley Park 2	(VAS 7922/161)
Ashley Park 5	(VAS 7922/164)

All these sites have high significance on scientific, Aboriginal and social criteria. All are on private property and none are under any threat in their current contexts except VAS 7922/151. This latter tree is dead and has fallen and cannot be expected to remain intact for much longer. However, it is a good example and does have three scars where bark has been removed.

Recommendation 29

It is recommended that the Shire Councils be made aware of these site locations so that any application to cut down trees by the landowner where these sites are located is subject to an inspection of the trees first. Attention is drawn to Recommendation 7 in Section 10.2.3.

10.3.9 Sites of low significance

Janefield 1	(VAS 7922/110)
Janefield 4	(VAS 7922/113)
Janefield 5	(VAS 7922/114)
Blossom Park Pony Club 1	(VAS 7922/115)
Blossom Park Pony Club 3	(VAS 7922/117)
Blossom Park Pony Club 4	(VAS 7922/118)
Blossom Park Pony Club 6	(VAS 7922/120)
Yarrambat Park 1	(VAS 7922/124)
Yarrambat Park 5	(VAS 7922/128)
Yarrambat Park 7	(VAS 7922/179)
Yarrambat Park 9	(VAS 7922/181)
Fenwick Park 1	(VAS 7922/181)
Fenwick Park 4	(VAS 7922/185)
Bung Bong 2	(VAS 7922/139)
Clarke Road 1	(VAS 7922/144)
Clarke Road 2	(VAS 7922/145)
Mayfield 1	(VAS 7922/148)
Bridge Inn Road 1	(VAS 7922/155)
Bridge Inn Road 2	(VAS 7922/156)
Bridge Inn Road 3	(VAS 7922/157)
Ashley Park 1	(VAS 7922/160)
Ashley Park 3	(VAS 7922/162)
Ashley Park 6	(VAS 7922/163)
Ashley Park 7	(VAS 7922/166)
Ashley Park 8	(VAS 7922/167)
Ashley Park 9	(VAS 7922/168)

All these sites are actually isolated artefacts (that is, they contain less than 5 artefacts within a 5m radius). Although they are documented on a survey for sites, they are of little value in archaeological terms and not worthy of strenuous preservation strategies.

Recommendation 30

It is recommended that isolated artefact occurrences be documented but that no further action is necessary.

10.4 Involvement of Aboriginal communities

Recommendation 31

The current legislation situation makes it particularly important that local Aboriginal communities are consulted in the early stages of development planning.

10.5 Summary of recommendations for further work.

1. A comprehensive survey of the whole Gorge area, including the enlarged Gorge Metropolitan Park and the Yarrambat Metropolitan Park.
2. A survey of the area north of an east/west line through Whittlesea and to include the Plenty tributaries.
3. A pamphlet on the prehistory of the Whittlesea shire.
4. A study of the Red Gum stands to ascertain the distribution and nature of scarred trees.
5. A survey of Quarry Hill to establish the Aboriginal use of the area and to attempt to identify a source of silcrete procurement.
6. A study of the oral traditions that might elucidate the history and the occupant of the grave at Glen Avon.
7. Work in conjunction with MMBW to establish an interpretive centre for public education within the Plenty Gorge Metropolitan Park and the present Yarrambat Metropolitan Park.

10.6 Advice on obtaining archaeological surveys

Consultant archaeologists can be sought from a list of names held at VAS. The VAS cannot recommend specific names but offers a list of available consultants. VAS personnel are available to offer advice on -

- . information from site survey records.
- . preparation of briefs and costings for archaeological work.
- . assistance in liaison with Aboriginal communities.
- . review of archaeological work carried out.
- . the management strategies for Aboriginal places.
- . planning implications of results of archaeological surveys for Shire Councils.

ACKNOWLEDGEMENTS

I would like to thank my partner, Fiona Weaver, and VAS staff who have offered support and advice, and Ann Robb and Megan Goulding for the drafting of maps. Those who helped in the fieldwork - willing liaison officers, Grant Desmond and Allan Wandin, and volunteers, Eve Fleme, Pam Brown, Paul Ossa and Judy Dwyer helped cover the ground with critical eyes. Cameron Beardsell freely offered useful information from his study of the corridor fauna and Phillip Styles geological data from his Gorge studies. I am grateful to all those landowners who happily allowed us to roam over their properties and who offered information about sites and oral histories.

RECOMMENDATIONS

Recommendation 1.

The survey has served to produce a preliminary overview of the archaeology of the Plenty Corridor, therefore it is strongly recommended that a more comprehensive study be carried out in the Gorge area as soon as the Gorge Metropolitan Park has been created. This should include the Yarrambat Metropolitan Park. This will create a better data base from which to establish Park policy for the specific management of sites.

Recommendation 2

On the completion of the above study, a number of appropriate sites can be identified which will best serve the purpose of providing an interpretive centre or focus for public education.

Recommendation 3

Sufficient sites exist in the Gorge area for a pamphlet to be created that can explain the Aboriginal occupation and use of the Valley.

Recommendation 4

It is recommended that the Shire Council and MMBW carry out no activities involving ground disturbance such as landscaping, trenching or building, without prior archaeological examination and consultations with the appropriate Aboriginal community.

Recommendation 5

No permit to disturb the ground within the Gorge Unit should be issued for any development by a private developer prior to an archaeological survey.

Recommendation 6

All requests for permits to develop areas greater than 5 hectares within this unit should require an archaeological survey to be carried out first.

Recommendation 7

It is recommended that a study of scarred tree types and distribution be carried out in the last remaining stands of old Red Gums since the resource has a finite life expectancy and such a study is long overdue. This study could be instigated and funded by the Shire Council.

Recommendation 8

It is recommended that no Red Gums be cut or removed prior to inspection by an archaeologist. This is a responsibility of the Shire Council.

Recommendation 9

It is recommended that VAS be notified of large scale ground disturbance such as might occur during large urban developments, landscaping, trenching by MMBW and Telecom. The ground area that this pertains to is:

- . A linear area of 500m or more
- . An area of 5 Ha or more

The best surveillance method for detecting sites on the alluvium unit is for VAS agents to monitor the ground disturbance as it occurs.

Recommendation 10

Red Gums grow close to natural watercourses so an inspection of these trees and indeed other large and old gums such as Manna Gums and Swamp Gums should be a pre-requisite to a permit granted to clear trees.

Recommendation 11

It is recommended that the Whittlesea Shire initiate a survey of the area to the north of the town, to complete the study of the Plenty catchment. A pamphlet outlining the prehistory of the Valley could then be drawn up for public consumption.

Recommendation 12

It is recommended that permits for all new large subdivisions (greater than >5Ha) which will be extensions of existing urban areas be preceded by a survey for archaeological sites.

Recommendation 13

It is recommended that the Shire Councils be made aware of specific sites in their jurisdiction and that they seek advice from VAS as to the best management strategies for the protection of those sites.

Recommendation 14

Within the specific areas of high archaeological sensitivity just set out, a permit to disturb the ground surface should be preceded by an archaeological survey. Ground disturbance can be caused by trenching, landscaping and road construction as well as urban development.

Recommendation 15

A survey should be carried out in the area of Quarry Hill in order to establish the Aboriginal use of the hill and to attempt to identify a source for silcrete procurement. This should be defined by the proponent seeking a development permit.

Recommendation 16

It is recommended that a Heritage agreement is set up between the landowner where the Aboriginal grave (VAS 7922/152) is located and the Wurundjeri Tribe Land Compensation and Cultural Heritage Council. This is a provision set out in the Aboriginal and Torres Strait Islander Heritage Protection Act, 1984. It provides for the continuing legal protection of the site independently of the land changing ownership. The agreement would aim to set out access rights to the site and recognition of the landowner's rights. VAS can act as the liaising agent in setting up communication between the parties.

Recommendation 17

It is recommended that the Wurundjeri Tribe Land Compensation and Cultural Heritage Council make a study of the oral traditions in the area that may throw light on the history and occupant of the grave (VAS 7922/152).

Recommendation 18

It is recommended that the landowner be told about this site (VAS 7922/137) and advised to participate in its protection by encouraging the growth of vegetation and keeping grazing animals off it.

Recommendation 19

The site (VAS 7922/137) would benefit greatly from mitigation measures to halt the progress of erosion of the northern edge of the site. VAS is the appropriate body to carry this out and to advise the landowner.

Recommendation 20

It is recommended that the landowner be told about the location of the site by VAS (VAS 7922/142). It is likely that he will have spread a layer of sand over the trotting track by this time. This will serve to protect the artefacts on the track. VAS should advise the landowner to maintain the sand covering and to refrain from carrying out any further ground disturbance in the vicinity of the track.

Recommendation 21

It is recommended that the artefacts of this site (VAS 7922/143) be collected off the track and given to the Wurundjeri Tribe Land Compensation and Cultural Heritage Council for the purposes of forming an educational package. The task of collecting the artefacts can be borne by VAS and should take approximately two days, including a short report.

Recommendation 22

It is recommended that to the best of its ability, VAS should ensure that such recommendations that it approves are carried out.

Recommendation 23

Site number VAS 7922/121 requires mitigation measures to arrest the erosion of the site which should be carried out by the Department of Conservation, Forests and Land (C.F.L.) with advice from VAS.

Recommendation 24

Site number VAS 7922/121 should be identified as appropriate for public education. When the site has been stabilized (see Recommendation 23), an interpretive on-site focus should be set up by MMBW with advice from VAS.

Recommendation 25

It is recommended for site numbers VAS 7922/111 and VAS 7922/112 that animal and vehicular traffic be kept off them to prevent further erosion of the sites and deterioration of the artefacts and to encourage revegetation.

Recommendation 26

Site numbers VAS 7922/116 and VAS 7922/123 are scarred trees. Measures should be taken to protect these and to incorporate them into the Park context with interpretive sign boards for public education. VAS can advise on both these matters but the responsibility lies with MMBW.

Recommendation 27

It is recommended that the cemetery proposed for a location on the south side of Janefield Training Centre property be the subject of an archaeological survey prior to any ground surface disturbance during its establishment. The proponent (C.F.L.) should fund the survey.

Recommendation 28

It is recommended that five sites (artefact scatters VAS 7922/125, /126, /127, /129, /180) be incorporated into a public interpretive walk within the Park. It is important that specific management measures are established to ensure that soil erosion is not allowed to worsen and that the risk of collection of artefacts by Park visitors is minimised by some means such as guided tours by the Ranger or public education at an interpretive centre.

Recommendation 29

It is recommended that the Shire Councils be made aware of these site locations (twentysix scarred trees enumerated in section 10.3.9), so that any application to cut down trees by the landowner where these sites are located is preceded by an archaeological inspection of the trees first. Attention is drawn to Recommendation 7 in Section 10.2.3.

Recommendation 30

It is recommended that isolated artefact occurrences be documented but that no further action is necessary.

Recommendation 31

The current legislation situation makes it particularly important that local Aboriginal communities are consulted in the early stages of development planning.

Appendix 1: Gazeteer of sites

Site name	VAS No.	Landscape Unit	Site Type	Dimensions	Contents	Preservation	Threats	Comment
							Animals	
							Vehicles	
Janefield	1 7922-110	S.P.	I.A.	5 x 5	3 artefacts	M	Erosion	
Janefield	2 -111	G	A.S.	93 x 2	57 artefacts	M	"	
"	3 -112	G	A.S.	250 x 3	40+ "	L	"	
"	4 -113	A.P.	I.A.		1 "	M	"	
"	5 -114	S.P.	I.A.		2 "	M	"	
Blossom Park								
Pony Club	1 -115	G	I.A.		1 "	M	Animals	
"	2 -116	G	S.T.		2 scars	H	Clearance	
"	3 -117	G	I.A.		1 artefact	M	Animals	
"							Vehicles	
"	4 -118	G	I.A.	5 x 5	4 "	M	"	
"	5 -119	G	A.S.	5 x 1	13 "	M	"	
"	6 -120	G	I.A.		1 "	M	"	
"	7 -121	S.P.	A.S.	177x80	33 "	M	Erosion	
"	8 -122	S.P.	A.S.	100x5	20 "	M	Vehicles	
"							Erosion	
"	9 -123	S.P.	S.T.		1 scar	M	Clearance	
Yarrambat Park	1 -124	S.P.	I.A.		1 artefact	M	Vehicles	
"	2 -125	G	A.S.	20x2	19 "	M	Vehicles	
"							Erosion	
"	3 -126	G	A.S.	10x5	13 "	L	Erosion	
"	4 -127	S.P.	A.S.	2 x 2	5 "	L	"	
"								
"	5 -128	S.P.	I.A.		1 "	M	"	
"	6 -129	S.P.	A.S.	22 x 15	5 "	M	"	
"	7 -179	S.P.	I.A.		2 "	M	Vehicles	
"							Landscaping	
"	8 -180	S.P.	A.S.	10 x 5	19 "	M	Erosion	
"							Erosion	
"	9 -159	S.P.	I.A.		1 "	L	Vehicles	
Fenwick Park	1 -181	B.P.	I.A.		2 "	L	Animals	
"	2 -182	B.P.	S.T.		1 scar	H	Clearance	
"	3 -183	B.P.	S.T.		1 scar	M	"	
"	4 -185	B.P.	I.A.		2 artefacts	M	Vehicles	
"	5 -136	B.P.	S.T.		1 scar	H	Clearance	

GAZETEER Cont...

Site name	VAS No.		Lands- cape Unit	Site Type	Dimen- sions	Contents	Preserva- tion	Threats	Comments
Carome	1	-137	G	A.S.	70x25	26 artefacts	H	Erosion	
Bung Bong	1	-138	B.P.	S.T.		1 scar	H	Clearance	
"	2	-139	B.P.	I.A.		1 artefact	L	Erosion	
"	3	-140	B.P.	S.T.		1 scar	H	Vehicles	
"	4	-141	B.P.	S.T.		1 scar	H	Clearance	
Donnybrook Road	1	-142	A.F.	A.S.	1000x3	62 artefacts	H/M	Vehicles	
"	2	-143	S.P.	A.S.	100x5	18 "	M	Vehicles & Animals	
Clarke Road	1	-144	G	I.A.		1 "	L	Animals	
"	2	-145	G	I.A.		1 "	L	Animals & Vehicles	
Coolamert	1	-146	A.F.	S.T.		1 scar	H	Clearance	
"	2	-147	A.F.	S.T.		1 "	H	"	
Mayfield	1	-148	G	I.A.		1 artefact	L	Flooding	
Masons Lane	1	-149	B.P.	S.T.		2 scars	H	Animals	
"	2	-150	B.P.	S.T.		2 scars	H	Clearance	
Glen Avon	1	-151	S.P.	S.T.		3 "	M/L	"	
"	2	-152	S.P.	S.A.		grave	H	Animals	
Masons Lane	3	-153	G	S.T.		1 scar	H	Clearance	
"	4	-154	B.P.	S.T.		1 "	H	Clearance	
Bridge Inn Rd	1	-155	H/U	I.A.		1 artefact	L	Animals	
"	2	-156	S.P.	I.A.		2 artefacts	L	"	
"	3	-157	H/U	I.A.		1 "	L	"	
Plenty Road	1	-158	B.P.	S.T.		1 scar	H	Clearance	

GAZETTER Cont...

Site name	VAS No.	Lands- cape Unit	Site Type	Dimen- sions	Contents	Preserva- tion	Threats	Comments	
Ashley Park	1	-160	S.P.	I.A.	1 artefact	L	Animals		
"	2	-161	S.P.	S.T.	1 scar	H	Clearance		
"	3	-162	S.P.	I.A.	1 artefact	L	Animals		
"	4	-163	S.P.	I.A.	1 artefact	L	"		
"	5	-164	S.P.	S.T.	1 scar	H	Clearance		
"	6	-165	S.P.	I.A.	1 artefact	L	Animals		
"	7	-166	S.P.	I.A.	1 "	L	"		
"	8	-167	S.P.	I.A.	1 "	L	"		
"	9	-168	S.P.	I.A.	2 "	L	"		
							Urban Development		
Riverside	1	-169	S.P.	A.S.	600x3	29 "	M	Animals	
"	2	-170	S.P.	A.S.	30x20	18 "	L	Animals	
"	3	-171	S.P.	A.S.	2 x 2	18 "	H/M	Erosion	
"	4	-172	G	I.A.	5 x 5	3 "	L	"	
"	5	-173	G	I.A.	200x3	4 "	L	Erosion	
"	6	-174	G	I.A.	1 "	1 "	L	None	
"	7	-175	G	I.A.	1 "	1 "	L	None	
Riverside	8	-131	S.P.	S.T.	1 scar	1 "	H	Animals	
"	9	-177	S.P.	I.A.	1 artefact	1 "	L	Urban Development	
"	10	-178	S.P.	I.A.	1 artefact	1 "	L	"	
Fenwick Park	6	-184	B.P.	S.T.	1 "	1 "	H	Clearance	

VICTORIA ARCHAEOLOGICAL SURVEY

THE ARCHAEOLOGICAL SURVEY OF THE PLENTY VALLEY CORRIDOR

CAN YOU HELP?

The Victoria Archaeological Survey is conducting a three month study to identify Aboriginal and European historical sites in the Plenty Valley Corridor prior to proposed urban development.

The survey and report will take three months to complete.

Commencement: October, 1988;

Field survey: October, 1988 - December, 1988;

Final report: January, 1989.

The aims of the Plenty Valley Corridor survey are:

- * to collect the documentary evidence for Aboriginal and European occupation of the area;
- * to consult with relevant Aboriginal communities;
- * to locate and record Aboriginal and European sites;
- * to evaluate the significance of these sites;
- * to assess the major threats to the sites;
- * to make recommendations for their protection and management.

The report will be used by the Ministry for Planning and Environment and will contain guidelines for the protection of Aboriginal and European sites that will be used in the planning processes for the development of the Plenty Valley.

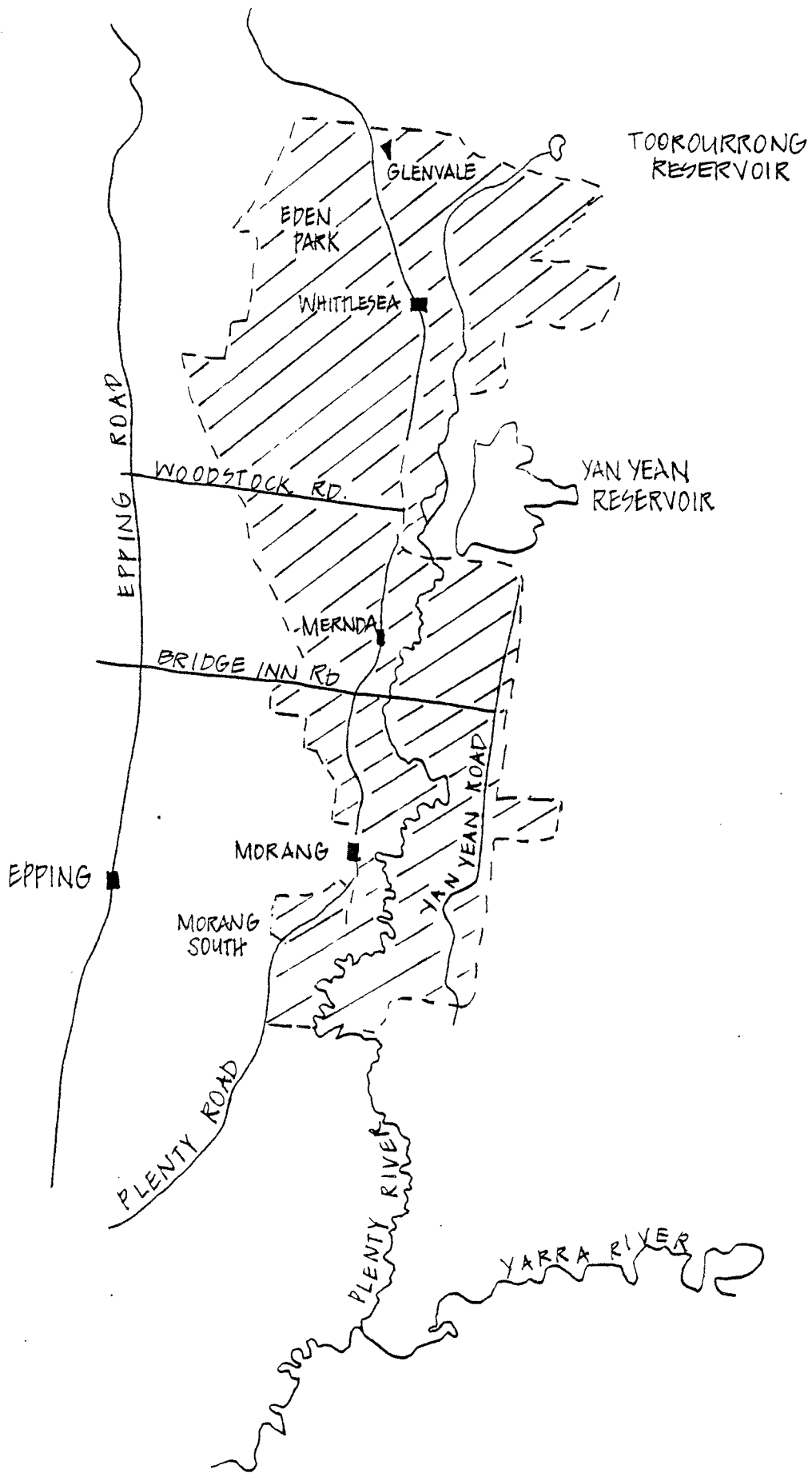
If you feel that you can help or have any information which you think might be relevant to this project, please contact:

Isabel Ellender,
Archaeologist,
Victoria Archaeological Survey.

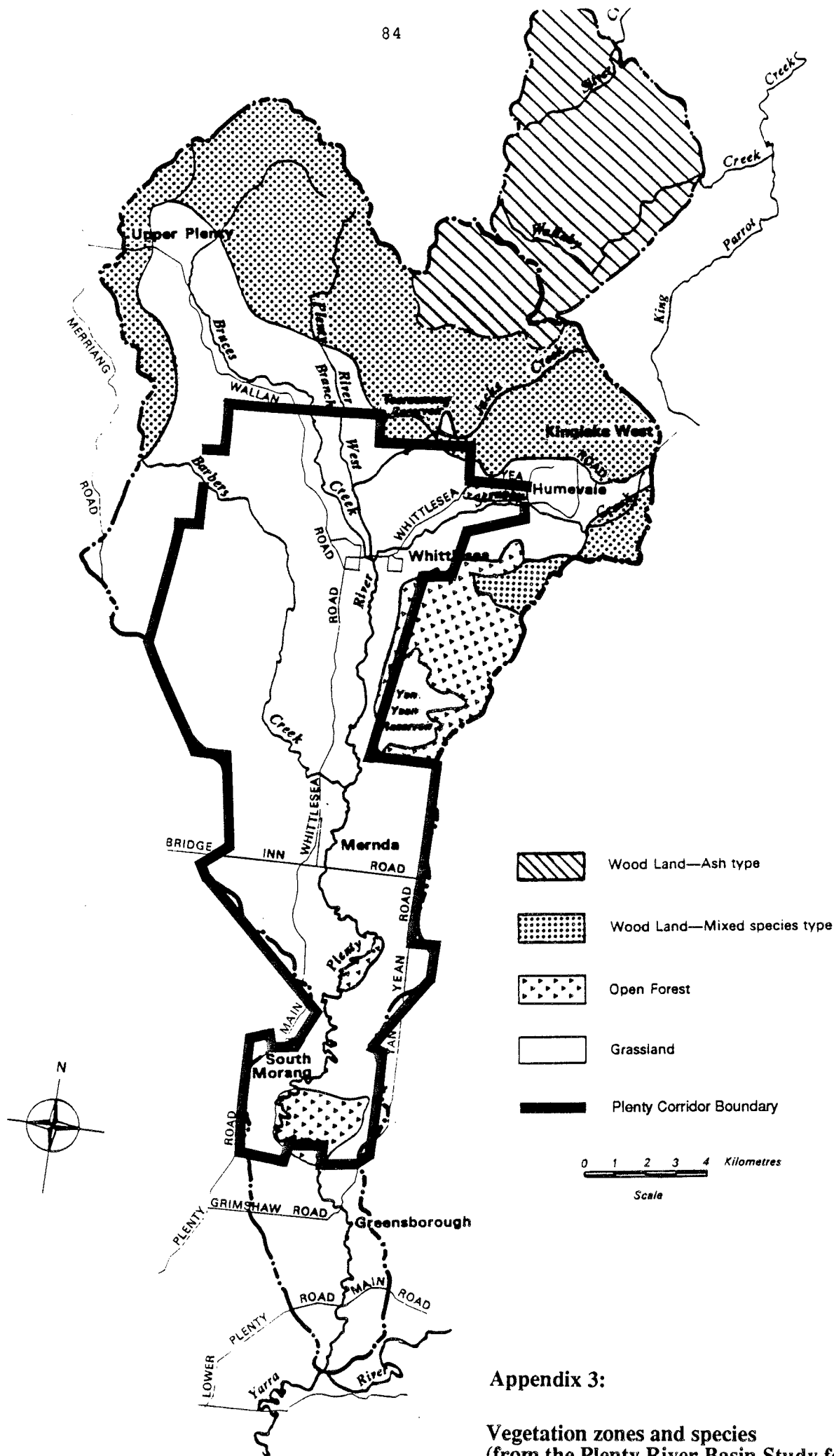
Fiona Weaver,
Archaeologist,
Victoria Archaeological Survey.

VAS is part of the Ministry for Planning and Environment. The conservation of Archaeological sites is formally recognised by the *Archaeological and Aboriginal Relics Preservation Act, 1972* and the *Aboriginal and Torres Strait Islander Heritage Protection Act, 1984*.

See reverse for location map.



PLENTY VALLEY CORRIDOR STUDY AREA



Appendix 3:

Vegetation zones and species
 (from the Plenty River Basin Study for the
 M.M.B.W., 1976)

Appendix 4: Definitions of stone artefacts and raw materials

A core is a piece of flakeable rock from which flakes are detached which can be made into stone tools. It displays at least one flake scar where a flake has been removed and a striking platform where it has been struck in order to remove the flake.

A flake is a piece removed from a core and is characterised by a conchoidal scar (bulb of percussion) and a striking platform.

A blade is a flake with parallel scars created where previous flakes were removed and is twice as long as it is wide.

A tool is an artefact which shows preparation and/or use damage on at least one edge. This preparation is called retouch and is undertaken to make the working edge stronger.

Fragments are pieces which do not fall into the above categories but are the result of the flaking process. They can also be broken pieces of tools or the waste material produced when tools are made.

The most common rock types which Aborigines used for manufacturing tools are as follows: silcrete, chert and quartz.

Silcrete - This is silicified sand or clay. It may be coarse or fine-grained and varied in colour though the grain is always visible. It is formed by metamorphic processes especially in association with basalt.

Chert - is an amorphous silica which occurs as nodules. Its texture is very fine, smooth and glassy and it has excellent flaking qualities.

Quartz - is a crystalline rock of variable quality and irregular flaking patterns. It may be found in veins in sedimentary rocks or pebbles in waterways.

Appendix 5: Raw materials: raw data and frequencies

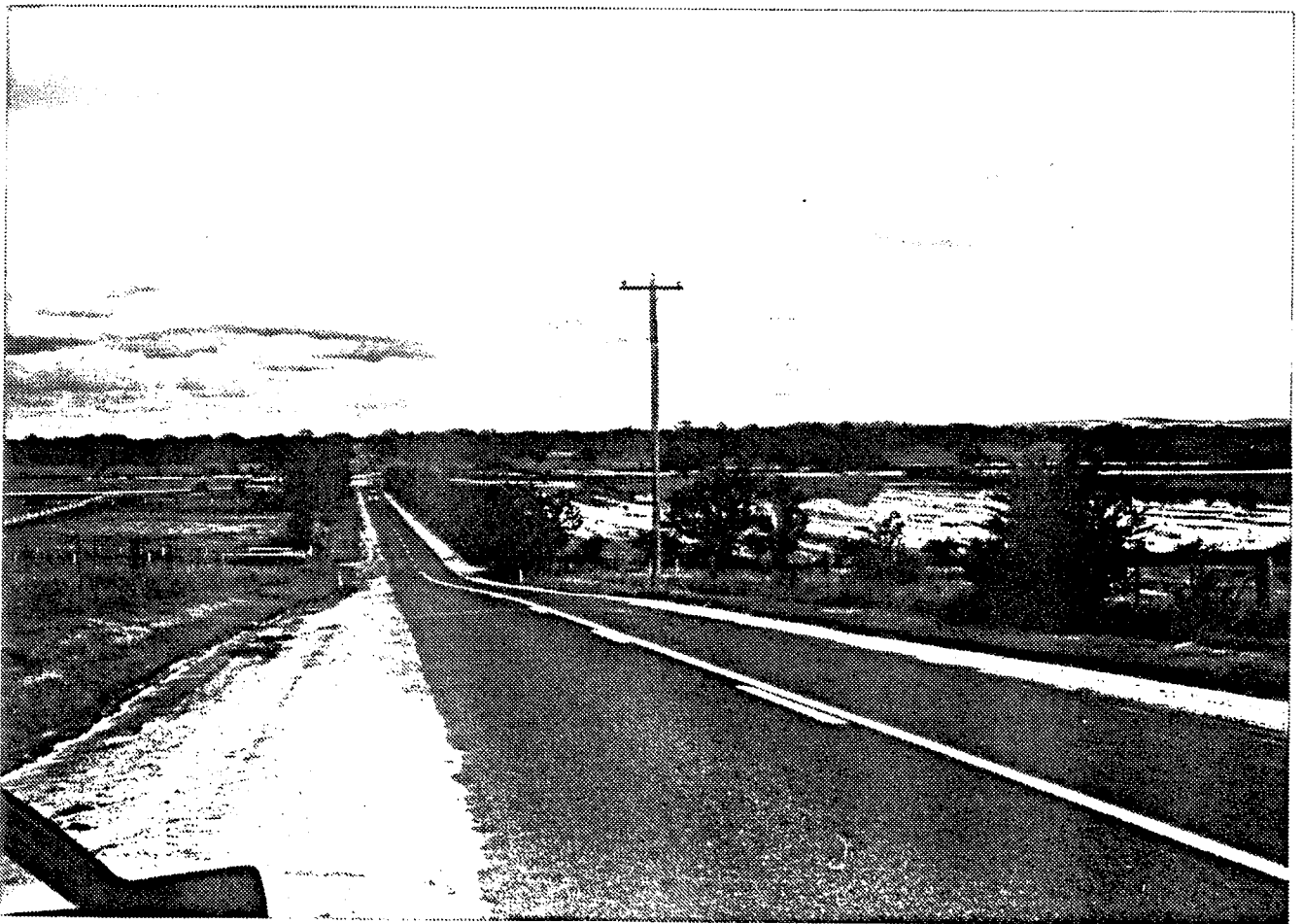
Vas Site No.	RAW DATA					PERCENTAGES						
	Chert	Quartz	Silicr	Other	Retouch	% Chert	% Quartz	% Silicr	% Other			
7922/110	3	0	0	0	3	100	0	0	0			
111	51	4	3	0	58	88	7	5	0			
113	1	0	0	0	1	100	0	0	0			
114	2	0	0	0	2	100	0	0	0			
115	0	1	0	0	1	0	100	0	0			
117	1	0	0	0	1	100	0	0	0			
118	3	0	1	0	4	75	0	25	0			
119	9	1	3	0	13	69	8	23	0			
120	0	0	1	0	1	0	0	100	0			
121	19	6	5	3	33	58	18	15	9			
123	2	9	9	0	20	10	45	45	0			
124	1	0	0	0	1	100	0	0	0			
125	0	0	0	0	0		N	O	D	A	T	A
126	6	6	0	0	12	50	50	0	0	0	0	
127	2	1	2	0	5	40	20	40	0	0	0	
128	1	0	0	0	1	100	0	0	0	0	0	
180	6	12	1	0	19	32	63	5	0	0	0	
181	1	1	0	0	2	50	50	0	0	0	0	
137	4	8	12	3	27	15	30	44	11	0	0	
185	0	2	0	0	2	0	100	0	0	0	0	
139	0	1	0	0	1	0	100	0	0	0	0	
142	4	29	29	0	62	7	47	47	0	0	0	
143	7	3	7	1	18	39	17	39	6	0	0	
144	0	0	1	0	1	0	0	100	0	0	0	
145	1	0	0	0	1	100	0	0	0	0	0	
148	0	1	0	0	1	0	100	0	0	0	0	
172	1	1	0	1	3	33	33	0	33	0	0	
112	0	0	0	0	0		N	O	D	A	T	A
129	4	0	1	0	5	80	0	20	0	0	0	
179	0	0	2	0	2	0	0	100	0	0	0	
155	1	0	0	0	1	100	0	0	0	0	0	
156	2	0	0	0	2	100	0	0	0	0	0	
157	1	0	0	0	1	100	0	0	0	0	0	
159	1	0	0	0	1	100	0	0	0	0	0	
160	0	0	1	0	1	0	0	100	0	0	0	
162	0	0	1	0	1	0	0	100	0	0	0	
163	0	0	1	0	1	0	0	100	0	0	0	
165	0	0	1	0	1	0	0	100	0	0	0	
166	0	0	1	0	1	0	0	100	0	0	0	
167	0	0	1	0	1	0	0	100	0	0	0	
168	0	1	1	0	2	0	50	50	0	0	0	
169	2	29	0	0	31	7	94	0	0	0	0	
170	1	0	12	0	13	8	0	92	0	0	0	
171	0	0	14	4	18	0	0	78	22	0	0	
173	1	1	1	0	3	33	33	33	0	0	0	
174	0	1	0	0	1	0	100	0	0	0	0	
175	0	0	1	0	1	0	0	100	0	0	0	
177	0	1	0	0	1	0	100	0	0	0	0	
178	0	1	0	0	1	0	100	0	0	0	0	

Appendix 6: The raw data for tool types found and their proportions in the total assemblage of each site

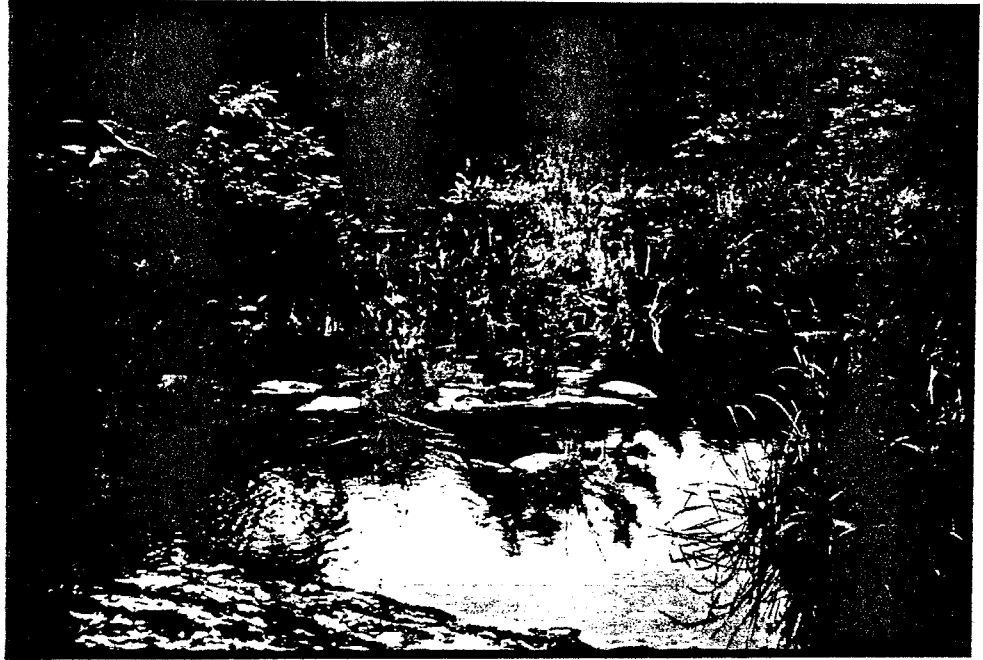
VAS No.	RAW DATA							PERCENTAGES								
	flake	core	blade	scrpr	frags	other	total	flake	core	blade	scrpr	frags	other	cortex	retouch	
7922/110	2	1	0	0	0	0	3	67	33	0	0	0	0	0	0	
111	20	4	0	1	33	0	58	35	7	0	2	57	0	5	9	
113	0	0	0	1	0	0	1	0	0	0	100	0	0	0	0	
114	0	0	0	0	2	0	2	0	0	0	0	100	0	0	0	
115	1	0	0	0	0	0	1	100	0	0	0	0	0	0	0	
117	1	0	0	0	0	0	1	100	0	0	0	0	0	0	0	
118	2	0	0	0	2	0	4	50	0	0	0	50	0	0	0	
119	1	1	0	0	11	0	13	8	8	0	0	85	0	1	8	
120	0	0	0	1	0	0	1	0	0	0	100	0	0	1	100	
121	12	1	3	0	15	3	33	35	3	9	0	44	9	4	12	
122	6	1	0	0	13	0	20	30	5	0	0	65	0	1	5	
124	1	0	0	0	0	0	1	100	0	0	0	0	0	1	100	
125				N	O	D	A	T	A							
126	1	0	0	0	11	0	12	8	0	0	0	92	0	1	8	
127	1	0	0	0	4	0	5	20	0	0	0	80	0	0	0	
128	1	0	0	0	0	0	1	100	0	0	0	0	0	0	0	
180	2	1	0	0	16	0	19	11	5	0	0	84	0	1	5	
181	0	0	0	0	2	0	2	0	0	0	0	100	0	0	0	
137	13	1	0	1	9	3	27	48	4	0	4	33	11	5	19	
185	2	0	0	0	0	0	2	100	0	0	0	0	0	0	0	
139	0	0	0	0	1	0	1	0	0	0	0	100	0	0	0	
142	23	5	9	2	23	0	62	37	8	15	3	37	0	9	15	
143	4	1	3	0	10	0	18	22	6	17	0	56	0	6	33	
144	1	0	0	0	0	0	1	100	0	0	0	0	0	0	0	
145	1	0	0	0	0	0	1	100	0	0	0	0	0	0	0	
148	1	0	0	0	0	0	1	100	0	0	0	0	0	0	0	
132	2	0	0	1	0	0	3	67	0	0	33	0	0	1	33	
112				N	O	D	A	T	A							
129	3	0	1	0	1	0	5	60	0	20	0	20	0	2	40	
179	0	0	0	0	2	0	2	0	0	0	0	100	0	0	0	
155	0	1	0	0	0	0	1	0	100	0	0	0	0	0	0	
156	1	1	0	0	0	0	2	50	50	0	0	0	0	0	0	
157	0	1	0	0	0	0	1	0	100	0	0	0	0	0	0	
159	1	0	0	0	0	0	1	100	0	0	0	0	0	0	0	
160	1	0	0	0	0	0	1	100	0	0	0	0	0	1	100	
162	1	0	0	0	0	0	1	100	0	0	0	0	0	1	100	
163	1	0	0	0	0	0	1	100	0	0	0	0	0	0	0	
165	0	0	0	0	1	0	1	0	0	0	0	100	0	1	100	
166	1	0	0	0	0	0	1	100	0	0	0	0	0	1	100	
167	0	0	0	0	1	0	1	0	0	0	0	100	0	0	0	
168	0	0	0	0	2	0	2	0	0	0	0	100	0	0	0	
169	6	3	6	1	15	0	31	19	10	19	3	48	0	2	7	
170	8	1	0	0	4	0	13	62	8	0	0	31	0	2	15	
171	6	0	0	3	9	0	18	33	0	0	17	50	0	4	22	
173	0	0	1	0	2	0	3	0	0	33	0	67	0	0	0	
174	0	1	0	0	0	0	1	0	100	0	0	0	0	0	0	
175	1	0	0	0	0	0	1	100	0	0	0	0	0	0	0	
177	1	0	0	0	0	0	1	100	0	0	0	0	0	0	0	
178	0	0	0	0	1	0	1	0	0	0	0	100	0	0	0	



1. Flooding of the Plenty River has been a longstanding component of valley hydrology. Alluvium has been deposited over a wide flood plain.



2. Extensive flooding of the Barber's Creek flood plain occurred during the survey in November 1988.



3. Typha, which grows at the edges of the water courses, was used by pre-contact Aborigines for its food value and the fibre to make strong string.



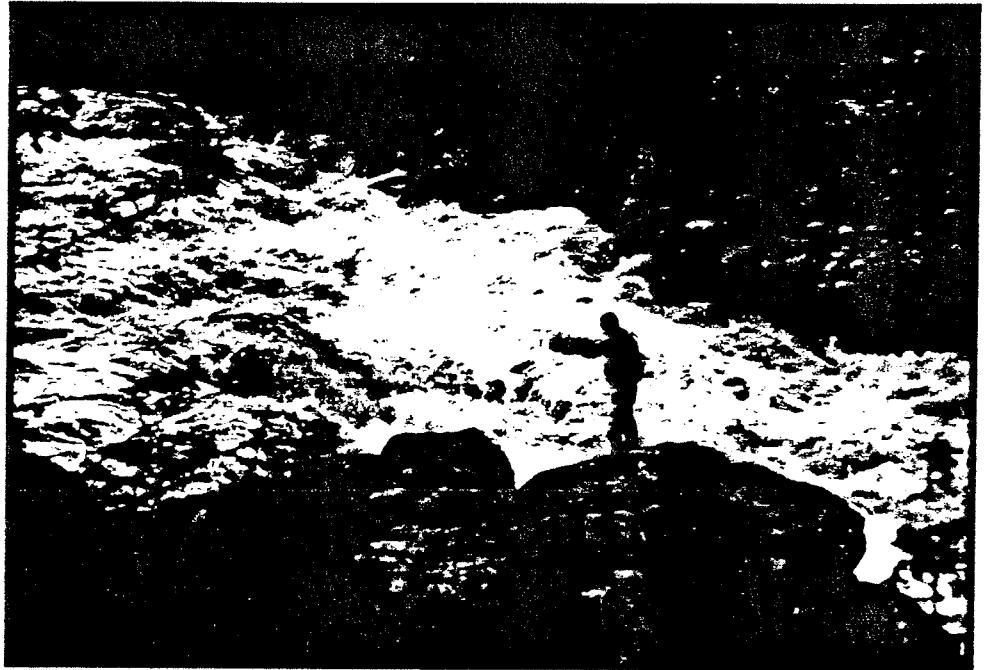
4. A typical view of the sedimentary landscape near Janefield. It supports an open forest vegetation beneath which eroded areas provide rare good surface visibility.



5. Large Red Gums of the Basalt Plains. The gums formed an open woodland even before clearance for agriculture.



6. The Alluvial Floodplain near Mason's Lane. Rich sediment supports lush vegetation including Red Gums and melalluca thickets. Visibility is poor.



7. The Plenty Gorge in flood.



8. An extensive artefact scatter is exposed over this eroded area on Blossom Park Pony Club.



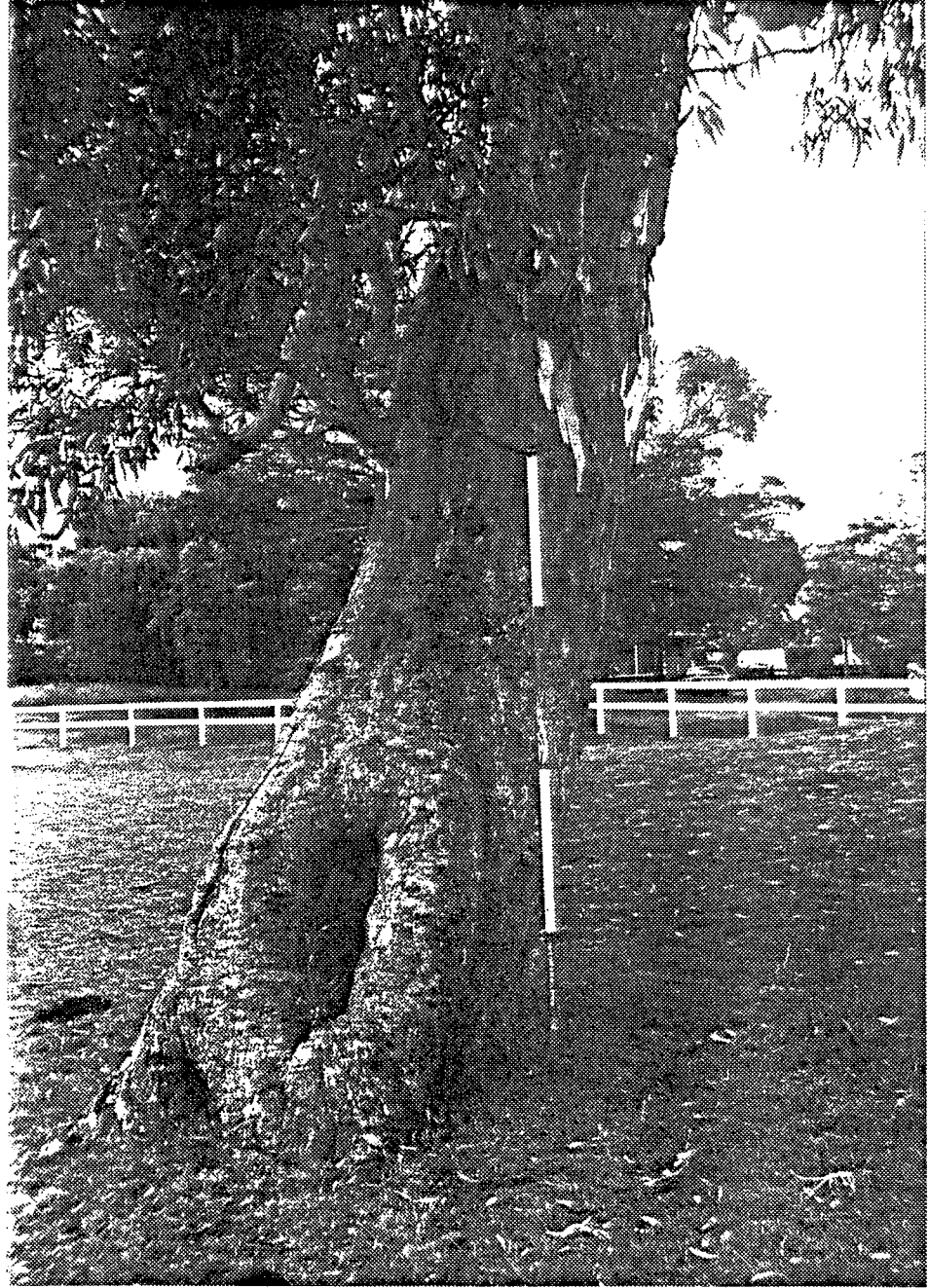
9. Several sites were found because they are exposed by tracks. This one is in Janefield.



10. A significant artefact scatter was exposed during the cutting of a new trotting track near Donnybrook Road.



11. Recording a site at Carome.

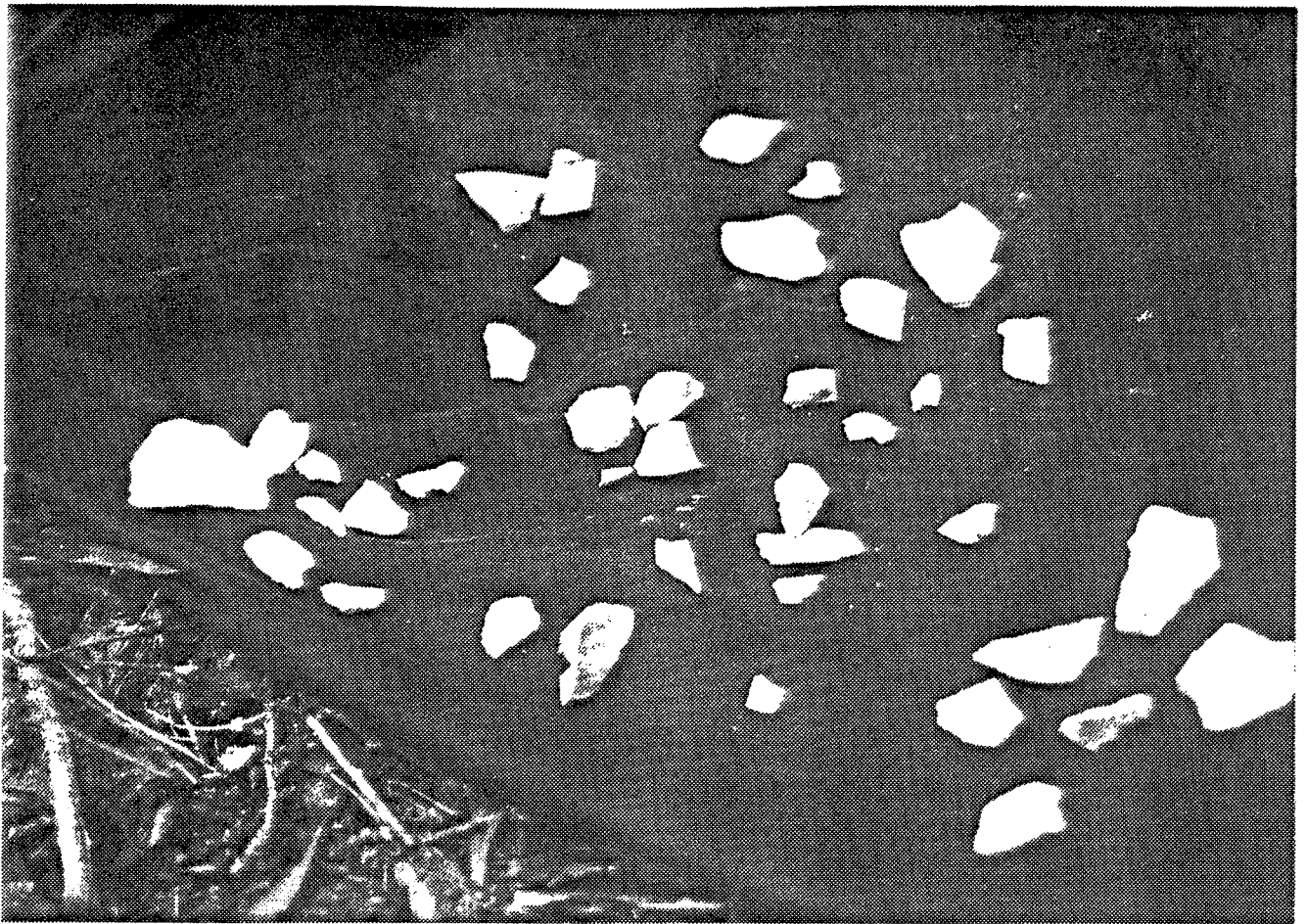


12-16. The range of scar shapes and sizes varies considerably. The next five plates show some of the range.

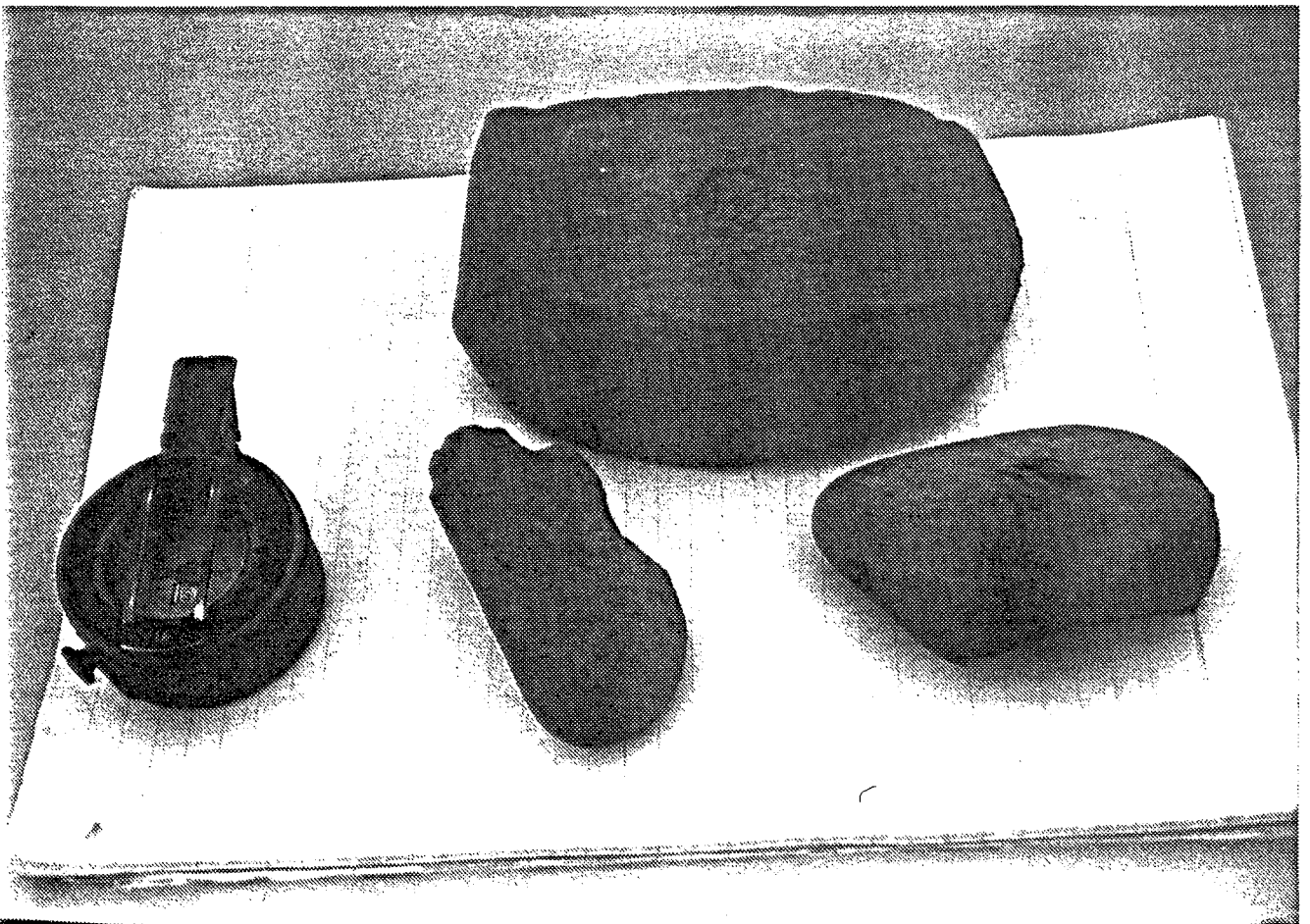








17. A variety of raw materials and tool types found in an artefact scatter at Carome.



18. Among the tools found at Blossom Park Pony Club the presence of grind stones indicate the use of seeds in the diet.

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