All matters relating to the plan and its contents should be directed to the Yorta Yorta Clans Group as the appropriate corporate body that represents the Yorta Yorta people on all land, water and heritage matters pertaining to their traditional lands-see map attached: Figure 1.
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1. INTRODUCTION

Biami the Creator:

_Biami created the river by sending an old woman down from the high country with her yam stick to journey across the flat and waterless plain. Biami then sent a giant snake along to keep an eye on her. She walked for many weary miles, drawing a line in the sand with her stick, and behind her came the snake following in and out all about, making the curves of the river bed with his body. Then Biami spoke in a voice of thunder, and lightning flashed above the high crack that was his place. Rain fell, and water came flowing down the track the old woman and the snake had made. After many moons she came to the sea, and went to sleep in a cave, while her dogs ran off and kicked up the sandhills about the river mouth (Cato, 1976:4; Dharnya Centre Mural on Biami)._ 

In Yorta Yorta lore, all features of the natural world can be attributed to the heroic deeds of the creation ancestors such as Biami. Thus, mountains, rivers, waterholes, animal and plant species, and other natural and cultural resources are all believed to have come into being as a result of events that took place during these journeys. Their existence in present-day landscapes is seen by many indigenous people as confirmation of their creation beliefs (see transcripts of evidence, Yorta Yorta Native Title Claim Federal Court 1996-97).

In Yorta Yorta philosophy, all features of the natural world are also linked. Whilst the Yorta Yorta, like other indigenous groups in Australia, were hunters and collectors prior to and after contact, most of our food-collecting activities were/are concentrated on and around the waterways. We are a water-based people whose very survival depends on the river systems that provide us with an abundance of fresh water food sources. The extensive evidence of middens and mounds (camp sites) and fish-trap systems that were constructed across the entrances of the river offshoots, are the tangible signs of Yorta Yorta reliance on water for our everyday livelihood. In addition, the oral knowledge from Yorta Yorta people of where and how our ancestors camped, fished and collected food from the waterways, indicates that just about everything was happening on in and around the waters. Any land-based activities that impinge on water within the Yorta Yorta lands thus impinge directly on us. Furthermore, the maintenance of natural water flows and environments is not only essential for the continuation of our culture and traditional rights, but is also important for the replenishment of natural resources and the survival of our ancestral lands.

In this context the Yorta Yorta don't make any distinction between water and land but see them as one whole system. As a consequence, the Yorta Yorta people have claimed native title not only over their traditional lands but also over the water (Yorta Yorta Policy on Management of Lands and Waters 1997; Morgan, 1997).

By contrast, the various government agencies that presently manage natural and cultural resources on public land in the Yorta Yorta lands (e.g. Parks Victoria, Forests Service, Goulburn Murray Water, Catchment Management Authorities) manage each aspect of the natural world.
separately. Furthermore, these various government agencies are mostly associated with
destructive land-use activities like grazing, timber-harvesting and irrigation that are in direct
conflict with the natural and cultural values that the Yorta Yorta people are aiming to maintain.
Finally, these various government agencies do not accord the Yorta Yorta people’s management
recommendations equal authority with their own.

These concerns about how the policies of the different government agencies differ from the
Yorta Yorta’s own views about how the land should be looked after are well expressed in our
submission to the proposed Barmah Forest Management Plan. “They [Yorta Yorta policies] are
often integrated or blended with more recent European associations with the forest. Yorta Yorta
Clans believe their historical and cultural links should not be compromised to fit into European
criteria’s of evaluation and assessment. As direct descendants of the original occupants and
owners of the forest, the Yorta Yorta see the forest and all of its encompassing features from a
holistic viewpoint. The forest nurtured their ancestors and provided them with the means for
their everyday survival and well being. In turn the Yorta Yorta looked after the forest and
nurtured it for the future, and when these practices and methods of forest management and care
are measured against more recent events, it is clear that they have an excellent track record that
stands firm in its own right. The Yorta Yorta clans feel that because present day methods of
assessment often overlook their associations and chronology, they have to continually justify
their legitimate interests in and claims to their land and heritage. While the Yorta Yorta have
special interests in land and heritage matters, they also have interests in all the other aspects of
the forest which are interdependent - such as the plant and wildlife ecology, hydrology and
environmental and conservation issues. This is a holistic approach to the forest management, and
one that is in conflict with the present criteria being used, which is largely based on the
categorisation and classification of forest values in accordance with their degree of significance.
The problem with this approach is that those aspects that are given less significance will be
overridden by those with higher priority - especially where they are simply incomparable. To
attempt to please everyone at the same time will continue to result in destruction of the
traditional life of the forest. To overcome this inherent problem the Yorta Yorta Clans would like
to see their peoples’ associations accorded their due status, and not blended with European
associations” (Yorta Yorta Murray Goulburn Rivers Clans Incorporated Submission to

To help overcome these disparities between non-indigenous and Yorta Yorta perspectives on
appropriate management of land and water, the Yorta Yorta Clans Group Inc applied for funding
from the National Estate Grants Program of the Australian Heritage Commission to prepare a
Management Plan for Yorta Yorta Cultural and Environmental Heritage. The main objectives of
this project were:
• to provide a plan that could be used as a reference point for all matters relating to our land,
waters and heritage;
• to identify and document sites of possible National Estate significance; and
• to establish initial policy guidelines on what we see as the major issues of concern in future
management of cultural and natural heritage in the area, including those values of National
Estate significance.
This document presents the results of that project. It is envisaged that the Management Plan for Yorta Yorta Cultural and Environmental Heritage will be of immense value to people working in natural and cultural resource management at both the community and governmental levels. Administrators, cultural officers, rangers, site officers, educators and other land and water management personnel should also benefit from the diversity of ideas, concepts and management models that have been incorporated into the Plan.

It must be emphasised from the outset that the plan is a "working document". It is by no means final and conclusive and is designed to incorporate additional information as it arises and to allow for revision of existing knowledge at our direction.
2. METHODS

2.1 TERMS OF REFERENCE FOR STUDY

The terms of reference for this National Estate Grants Program project state that the project will:

1. compile and review documented information available for cultural and environmental heritage within the region and identify gaps in existing knowledge of the region;

2. conduct field survey, using professional people nominated by and supervised by Yorta Yorta elders, to identify and document further heritage places. Those places of National Estate significance should be documented according to the AHC's minimum documentation standards (see clause 13 of the Conditions of Award at Attachment A);

3. identify and document threats and management problems for the whole area, and particular issues for those places of National Estate significance;

4. integrate all available information to develop policies and management strategies to protect the heritage values of the area as a whole, with particular reference to those places of National Estate significance; and

5. produce a database of all places of heritage significance in the area and identify those having National Estate values.

2.2 METHODOLOGY

In line with Yorta Yorta views about their natural and cultural heritage a holistic approach has been used as the guiding methodology for this project. Fieldwork commenced in early 1996 and was completed in early 1998.

2.2.1 Cultural heritage methodology

The cultural heritage work was conducted by two Archaeological Heritage Consultants - Theresa Bonhomme and John Craib. Both have done previous archaeological work in the study area and are currently working on reviewing all archaeological work for the inclusion in a generic site map of the study area. The researchers have developed very good working relationships with our community and have trained some of our people in cultural resource management skills.

The primary purpose of this component of the study was to locate all available data on archaeological resources within the Yorta Yorta lands and to synthesise this information within a regional framework that could then be used as a foundation for cultural heritage significance statements. The study located 70 archaeological studies and surveys that have been conducted
in Yorta Yorta lands, 90% of which have been produced since 1980 and more than 60% of them since 1990. Details of these various studies are given in Appendix 1.

2.2.2 Environmental heritage methodology

The environmental heritage component of the project was conducted by Wayne Atkinson. Mr Atkinson is a Yorta Yorta person with an Honours degree in Archaeology History and Indigenous Heritage. His current focus is on reconstructing environmental aspects of the study area, including the relationships between vegetation and cultural sites.

Between 1996 and 1998, he conducted extensive field survey work in the region. This included:
- inspections of all those sites visited and discussed by the Yorta Yorta in their evidence to the Federal Court as part of the Native Title Claim
- documentation of the major threats and management issues in relation to those sites
- consultations with Yorta Yorta elders to collect their oral knowledge about animals and plants
- interviews with more than 50 Yorta Yorta people
- studies of the different land forms (geomorphology) in relation to vegetation distribution and Yorta Yorta food gathering patterns to investigate what were the main areas that were being utilised in the food quest.

In addition, data was collected from other studies on:
- broad environmental patterns in the study area as a basis for reconstructing vegetation types and the seasonal events that influenced movement
- the use of fire to manage the land
- the effects of domestic stock on native vegetation, cultural sites and water since occupation,
- the relationships between vegetation and water, and
- sites of natural and cultural significance in the area.

2.3 IDENTIFICATION OF SIGNIFICANT PLACES AND SITES

Sites of natural heritage significance were identified from:
- discussions with our people.
- the places list of the Register of the National Estate
- studies of natural heritage values done at least partly within the Yorta Yorta lands (e.g. LCC 1991; Sherwin 1996; Robinson & Mann 1996; ECC 1997, p. 131; Robinson 1998)
- criteria for the nomination of sites to the Register of the National Estate (Table 1) and the World Heritage List (UNESCO 1972)
- the Ramsar Convention list of internationally significant wetlands
- Ramsar Convention criteria for the nomination of sites as internationally significant wetlands (UNESCO 1972), and
- their known importance for birds listed as protected under the Agreement between the Government of Australia and the Government of Japan for the Protection of Migratory Birds and Birds in Danger of Extinction and their Environment (JAMBA), and The Agreement

The scientific significance of cultural and archaeological sites was generally assessed on an individual (i.e. site-by-site) basis, using contents, structure and integrity (i.e., how well it is preserved) as the primary variables.

An additional, key variable was the location of a site and its functional relationship with other sites in an area. For example, it might be argued that because scarred trees and small mounds are numerous within the Yorta Yorta lands, and that they are likely to contain a limited range of archaeological material, these sites hold little scientific significance. However, when viewed in the context of being special-use locations within a foraging radius of an occupation camp, the location and distribution of these sites becomes highly significant.

In addition to these criteria, the significance of cultural heritage places and sites was assessed against the Australian Heritage Commission’s criteria for inclusion of places on the Register of the National Estate (Table 1).

### Table 1. Significance Criteria for Inclusion on the Register of National Estate

<table>
<thead>
<tr>
<th>Criterion A: Importance in the course, or pattern, of Australia's Natural or Cultural History</th>
</tr>
</thead>
<tbody>
<tr>
<td>A.1 Importance in the evolution of Australian flora, fauna, landscapes or climate places which contain evidence and products of past climatic, geological, geomorphological, ecological or biological processes.</td>
</tr>
<tr>
<td>A.2 Importance in maintaining existing processes or natural systems at the regional or national level places which are important in the maintenance or demonstration of continuing climatic, geological, geomorphological, ecological or biological processes.</td>
</tr>
<tr>
<td>A.3 Importance in exhibiting unusual richness or diversity of flora, fauna, landscapes or cultural features places which are important by virtue of the richness, diversity or complexity for any of their physical, biological or cultural attributes</td>
</tr>
<tr>
<td>A.4 Importance for association with events, developments or cultural phases which have had a significant role in the human occupation and evolution of the nation, State, region or community where the contribution of an event, development or phase to the broad patterns of Australian history or prehistory can be clearly demonstrated, or where the place epitomises elements of those patterns</td>
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<table>
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<tr>
<th>Criterion B: Possession of Uncommon, Rare or Endangered Aspects of Australia's Natural or Cultural History</th>
</tr>
</thead>
<tbody>
<tr>
<td>B.1 Importance for rare, endangered or uncommon flora, fauna, communities, ecosystems, natural landscapes or phenomena, or as a wilderness aspects of the natural environment which are rare or relatively rare.</td>
</tr>
<tr>
<td>B.2 Importance in demonstrating a distinctive way of life, custom, process, land-use, function or design no longer practised, in danger of being lost, or of exceptional interest places which characterise past human activities which are rare, endangered or uncommon by virtue of being a. few in number; b. few in number due to subsequent destruction; c. susceptible to rapid depletion due to</td>
</tr>
</tbody>
</table>

11
changed practices or other threats; d. outstanding example of uncommon human activity

Criterion C: Potential to Yield Information That Will Contribute To An Understanding of Australia's Natural or Cultural History

C.1 Importance for information contributing to a wider understanding of Australian natural history, by virtue of its use as a research site, teaching site, type locality, reference or benchmark site

places which have value:

a. as actual research sites
b. for [providing an important information link in interpreting or understanding a significant aspect of the Australian or regional environment]

C.2 Importance for information contributing to a wider understanding of the history of human occupation of Australia

research sites producing research information about the cultural environment or cultural history. Research value must relate to the likelihood of the place containing information within its fabric.

Criterion D: Importance In Demonstrating The Principal Characteristics Of: (I) A Class Of Australia's Natural Or Cultural Places; Or (II) A Class Of Australia's Natural Or Cultural Environments

D.1 Importance in demonstrating the principal characteristics of the range of landscapes, environments or ecosystems, the attributes of which identify them as being characteristic of their class

a place should be considered if, on the basis of its attributes, it demonstrates the principal characteristics of one or more (or a particular combination of) classes or types of places, where "Type" may refer to a particular kind of geological formation, landform, vegetation association, landuse, landscape etc., which occurs over a wider area than the place itself.

D.2 Importance in demonstrating the principal characteristics of the range of human activities in the Australian environment (including way of life, custom, process, landuse, function, design or technique)

a place must clearly represent the period, method of construction, techniques, way of life, etc. of its Type. The place must enhance our understanding of the class of resources of which it is part. It should reflect the major characteristics of its Type, or demonstrate the variation which occurs within the Type, or demonstrate the evolution of the Type, or be transitional between that Type and others.

Criterion E: Importance In Exhibiting Particular Aesthetic Characteristics Values By A Community Or Cultural Group

E.1 Importance for a community for aesthetic characteristics held in high esteem or otherwise valued by the community

the aesthetic value of a place must be able to be assessed with sufficient rigour to allow the basis for registration to be clearly stated.

Criterion F: Importance In Demonstrating A High Degree Of Creative Or Technical Achievement At A Particular Period

F.1 Importance for its technical, creative, design or artistic excellence, innovation or achievement

a place is eligible if it demonstrates clearly a particularly appropriate solution to a technical problem using or expanding upon established technology, or developing new technology, that solution being outstanding due to its conceptual strength.

Criterion G: Strong or special association with a particular community or cultural group for social, cultural or spiritual reasons

G.1 Importance as a place highly valued by a community for reasons of religious, spiritual, symbolic, cultural, educational or social associations

places which are held in high esteem by the Australian community or a segment of it, that esteem being demonstrated and special. The value to the community must be beyond normal regard felt by a community for its familiar surroundings.
3. BACKGROUND

3.1 WHO ARE THE YORTA YORTA?

The Yorta Yorta and Bangerang both claim ancestry from the people who occupied the traditional lands as illustrated in Figure 1. Because both groups have common ancestral links with the study area and have agreed that we are one and the same people (Yorta Yorta Native Title Application National Native Title Tribunal 1994), the term Yorta Yorta is used throughout this report when referring to the Yorta Yorta and Bangerang as a collective group.

Prior to colonisation, the Yorta Yorta population is estimated to have numbered approximately 2,400 (Butlin, 1983, 126-28; Curr, 1883:107,120; Yorta Yorta Land Claim Submission, 1985: 23). Today, the total number of Yorta Yorta people is estimated to be in the order of 4,000 to 6,000 (Hagen, 1996:8).

The majority of surviving Yorta Yorta people today still live in our traditional lands at Echuca, Moama, Shepparton, Mooroopna, Cummeragunja, Barmah, Nathalia, Finley, Cobram, Kyabram, Wangaratta and Mathoura, and other smaller towns. Others live nearby at Albury, Wodonga, Deniliquin, Kerang, Barham and Swan Hill. A significant number of our people live in Melbourne but visit the area regularly. A small number of people live further afield, largely as a result of marriage to people from more distant areas.

It is a little over a hundred and fifty years since our lands were first occupied by Europeans. Since then, our society has changed to cope with massive alterations in technical, environmental and economic circumstance. Despite this, however, the Yorta Yorta today remain a coherent group with our roots firmly embedded in our past.

3.2 BACKGROUND OF YORTA YORTA OCCUPATION

Before contact the Yorta Yorta occupied a unique stretch of territory located in what is now known as the Murray-Goulburn region (Figure 1). Our lifestyle was based on hunting, fishing and collecting food-plant resources. Being river based people, however, most of our time was spent fishing, as the majority of their food was provided from the extensive network of rivers, anabranches, lagoons, creeks and lakes which are still regarded as the life source of our people (Bonhomme, 1990; Craib, 1991; Atkinson, 1996:1).
Against this brief background of pre-occupation history, one can reconstruct a rather idyllic picture of the traditional Yorta Yorta lifestyle. Because of the abundance and diversity of food resources in the Murray Valley in pre-contact times (Curr, 1883; Hibbins 1978: 137; Bossence 1979: 41), the average amount of time spent in the food quest was minimal, so allowing maximum input into cultural development and the maintenance of country and family. This is not to say that the Yorta Yorta were immune from hardships and conflict. But, when these periods of hardship are measured against our timeless occupation of the land it is clear they our ancestors were able to deal with each situation as it arose and maintain their links with their tribal lands (Hagen Report on Yorta Yorta Associations, 1997).

The arrival of Europeans in the 1820s, however, had a devastating impact on traditional groups. Within the first generation of European contact, the Yorta Yorta population was reduced by 85%. Our ancestors were forcibly removed from their tribal lands and left to eke out an existence on the edges of European pastoral settlements. As in other parts of the frontier, violence continued and the Yorta Yorta fought a sustained resistance struggle against the taking of their land. Some co-existive arrangements to share land with pastoralists were made but, because of the push for pastoral land and the "Aborigines Acts" which were introduced to control the lives and movements of tribal groups, co-existence was only short lived. Nevertheless, the pastoral industry benefited greatly from the cheap labour and domestic services provided by our ancestors, whom in return were exploited and abused by the landholders. Daniel Mathews wore the wrath of local pastoralists when he set up Maloga Mission as a refuge for displaced groups and ‘enticed’ them away from surrounding stations (Cato, 1993:43-44; Aborigines Protection Act Victoria 1869,1884; New South Wales, 1909,1915; Reynolds, 1981:106-187; Christie, 1979: 53-80; Canon,1993:141; Lewes,1883:7-8; Curr, 1883:89-97).

The remaining Yorta Yorta population and other groups from neighbouring areas were eventually relocated at Maloga Mission on the New South Wales side of the Murray River in 1874. Maloga was eventually closed and the residents were relocated at Cummeragunja in 1888-89. Cummeragunja became the first place where the Yorta Yorta were able to regroup after the destruction. It also provided leadership for the development of what became the Aboriginal political movement in the 1930s. While ‘Cumma’, as it is affectionately known, provided a refuge for local groups, our ancestors still continued to maintain their traditional links with their tribal lands. They collected food to supplement the reserve rations and continued to use the country as their ancestors had done for thousands of years (Cato, 1976:16-21; Broome, 1982:76-78; Horner,1974:75-80; Marcus, 1986; Atkinson, 1981:63).

3.3 NATIVE TITLE CLAIM

Between 1860 and 1984 we have made 17 separate attempts to obtain land and compensation. Our only success was the granting of 1200 acres of the former Cummeragunja Reserve. The land, granted under inalienable freehold title, was a mere fraction of our traditional land base and less than half of the original reserve lands which were close to 3,000 acres ( Yorta Yorta Chronology of Past Claims, 1985; International Permaculture Journal, 1988:29-31; Barwick, 1972:64).
On 3 June 1992, however, the High Court decided that the Meriam people of Torres Strait hold a common law native title to Mer (Murray Island). The court also implied that native title continues to exist elsewhere in Australia, wherever it has not been extinguished by governments and provided that the local Aboriginal or Torres Strait Islander groups have maintained a relationship with their traditional country based on customary law (NTA, 1993).

Legislative recognition of this historic High Court decision is contained in the Native Title Act 1993 (Cwlth), which protects any surviving native title and sets up a system of tribunals to enable native title claims to be registered and determined. Several State and Territory governments have also developed legislative responses to the decision.

In 1994, The Yorta Yorta/Bangerang people instigated a claim under this Act, seeking recognition of native title to public lands and waters within our traditional lands, and compensation for areas that had been alienated. We maintain that the people who identify as Yorta Yorta or Bangerang today are the descendants of Aboriginal people who held these lands at the time of white occupation of the region in the late 1830's and after. Furthermore we maintain that we have never relinquished our interests in the area, and have continued to live on the land of our ancestors and use its resources, in so far as this has been possible given the interference with our interests since white occupation.

While the results of this claim are not yet known, two broad implications of the High Court’s Native Title decision are already obvious. Firstly, there is now an opportunity for at least some Aboriginal and Torres Strait Islander groups such as ours to receive formal, legal recognition of their long-held claims of customary ownership of their traditional country. Secondly, the existence of native title in Australian common law has confirmed the status of all Aboriginal and Torres Strait Islander peoples as the first owners of Australia. This in-principle recognition replaces the former legal fiction of terra nullius (the empty land legal fiction) and considerably strengthens the long-held view of indigenous peoples that their inherent rights to use and manage Australia's land and water resources must be recognised (Council for Aboriginal Reconciliation: Key Issues, 1996:17).

In the context of these two implied changes in land management possibilities for indigenous people, it is fully appropriate that the Yorta Yorta prepare our own management plan for the management of our environmental and cultural heritage.

HERITAGE VALUES

4.1 ENVIRONMENTAL HERITAGE

To understand the environmental and cultural heritage values of our land it is necessary to first examine the physical and cultural histories of the area in some detail. Important changes to the Yorta Yorta landscape have occurred over time and each of these changes has affected the distribution of physical and biological resources and thence the distribution and lifestyle of our people (Erlandson 1994). Rivers have changed course, massive lakes have formed and then dried out, and extensive, rich wetlands have come into existence. Against this dynamic
background, the Yorta Yorta have adapted to the differing landscapes and shifted sites as the hydrology, climate and resources of the region varied.

The following sections provide an environmental context to our natural and cultural heritage.

4.1.1 Geomorphology

Most of our lands are within the Riverine Plain. This region consists of the fluvial plains of the Murray, Murrumbidgee, Goulburn and the Lachlan rivers and their tributary and distributary streams. This is a vast, flat tract of river and lake deposits that measures approximately 76,800 km² (Butler et al. 1973). The area lies between the semi-arid zone to the west and the more humid highlands to the southeast.

The major river systems of the Riverine Plains consist of a complex system of tributaries, lake systems, ephemeral channels and palaeochannels. These reflect a changing hydrology in the region throughout its history. Secondary aeolian features often form the dominant topography on an otherwise level landscape and it is within these features that much of the palaeo-environmental information is retained.

The Riverine Plain was formed by Pliocene, Pleistocene and Holocene stream deposition between about five million and 1600 years ago (Butler et al. 1973; Tickell 1977; ECC 1997), as a result of three distinct phases of river development and deposition. Phase 1 is represented by the distributary and tributary channels of the prior streams. Landscape features associated with this phase are too old to be dated using radiocarbon techniques (c. 36,000 years old). These channels were associated with the closed evaporative basins of the large interconnecting lakes which occur in the extreme west of the study area.

Phase 2 saw the formation of ancestral river channels and the deposition of water and wind-borne sediments. Source-bordering dunes are believed to date from this phase of river development. Conditions for the formation of such dunes ceased around 15,000 years ago (Pels 1971). A gradual change in stream hydrology then brought about the change to the present incised channels (Phase 3) throughout the Riverine Plain. This phase was completed by 4,000 years ago when the modern channels had assumed their present courses.

The geomorphological history of the ancestral river development along this portion of the Murray River is complicated by successive phases of tectonic activity that occurred between Deniliquin and Moama. Tectonic movement along the Cadell Fault, about 25,000 years ago, raised the fault scarp (Cadell Block) which, in turn, altered the course of the Murray and Goulburn Rivers.

Bowler (1978) identified three fluvial complexes, Green Gully-Tallygaroopna, Kotupna and Goulburn, which characterise the tectonic activities and attendant hydrological variations. Radiocarbon dates associated with sediments representative of various phases of stream activity provide a time frame for the transitions between these complexes.
The earliest complex is Green Gully-Tallygaroopna and represents the period prior to significant tectonic rise along the Cadell Fault. During this period (i.e., prior to 30,000 B.P.) the Murray River flowed northwest from the study area. Between 25,000-30,000 B.P. tectonic activities began to raise the Cadell block to a point where it blocked the flow of the Murray river and created a large backwater, a process now known as the Kotupna Complex. The Kotupna phase spanned the period between pre-25,000 to about 15,000 B.P. during which time the rivers produced widespread morphologic and sedimentary modifications across the plain (Bowler 1971:91).

Bowler (1971:102) argues that there are local and regional data to suggest the possibility of significant climatic change occurring during the Tallygaroopna-Kotupna transition. Lacustrine evidence suggests that the period of the Kotupna regime represented the waning stage of highland glaciation in which hot windy summers alternated with cold stormy winters. The retreat of glaciers in the Snowy Mountains and the final disappearance of periglacial environments date to between 15,000 - 13,000 B.P. (Bowler 1971:108).

Lake Kanyapella was formed during this period, fed by the ancient course on the Goulburn river and another, unnamed, lake; the latter was fed by the Murray river. The streams were actively depositing sandy point-bars which provided source material for the growth of source-bordering sand dunes at 16,000 B.P. However, by 14,000 B.P. a dry phase began during which the flow of water was reduced and the lakes became dry.

In the post-glacial Goulburn phase (within the last 15,000 years), stream discharges moderated and sediment loads became muddier, indicative of slower stream velocities. Processes of fluvial erosion and deposition were curtailed; stream banks, slopes and dunes stabilised; and soil mantles developed. Groundwater tables fell and lakes dried up. Populations of plants and animals suited to the warmer conditions expanded to fill the various ecological niches.

By 6000 years ago, the Murray River had established its modern course and the extensive swamps, lakes and associated wetlands habitats on the floodplain had stabilised. The present hydrology of the Riverine Plain is thus associated with incising young rivers that are superimposed on a mature system in some locations and incised into older riverine sediments in others. Modern channels began to form as early as 10,000 BP and all of the present rivers were established in their channels by 4,000 BP.

These main, modern rivers of the Riverine Plain flow from the southeast highlands of the Great Dividing Range. Historically, therefore, the water feeding these river systems and causing flooding was derived primarily from winter rainfall between May and September and snowmelt in the highlands between September and November. However, construction of major water storages in the twentieth century has substantially altered the timing, frequency, duration and depth of flooding (Jacobs 1990; Close 1990).

4.1.2 Environmental variations

As a consequence of the various geomorphological, geological and climatic events which have occurred in the Yorta Yorta lands, seven broad types of natural environment have developed:
riparian systems, lagoons and swamp, floodplains, box woodland plains, sandhills, box-ironbark forests and granitic hills.

Each of these environments supports (or supported), different species of plants and animals, or provided habitat for particular species of animal at certain times of the year.

The riparian systems include the main rivers and creeks, notably the Murray, Goulburn, Ovens, Broken and Edwards Rivers, and Gulpa, Broken, Boosey and Nine Mile Creeks. The larger rivers represent permanent waterways that traverse the entire extent of the Yorta Yorta lands and link very different physical and natural environments (e.g. southeastern highlands and semi-arid riverine plains). They typically consist of permanent channels lined by River Red Gum *Eucalyptus camaldulensis*, Silver Wattle *Acacia dealbata* and other shrubs (Robinson 1998) and ephemeral, slower-moving backwaters and ponds. The smaller creeks were ephemeral historically and consisted of a series of deep, permanent pools and banks lined with box woodland vegetation rather than red gum (Robinson & Mann 1996). All of these riparian sysytems are (or were) vital for native fish, particularly as they provide corridors for fish movement at different times of the year (Cadwallader & Lawrence 1990). The main river channels also support a particular species of freshwater mussel, the river mussel *Alathyria jacksoni* (Walker 1990), one species of crayfish (Murray Crayfish *Euastacus armatus*) (Geddes 1990) and two species of tortoise which do not live in the billabongs.

The lagoons and swamp environments consist of ox bow lakes or billabongs formed from former river channels. Billabongs cover a surprisingly large area of the floodplain adjoining the main river systems and are characterised by shallow edges, relatively permanent water, and still and sheltered waters (Boon *et al.* 1990). Because of these distinctive, physical characteristics, billabongs have a very high and active biomass of plants and animals compared to rivers and actually contribute organic matter to the riverine ecosystem (Boon *et al.* 1990). Billabongs are consequently regarded as ‘virtual pots of food.’ (Boon *et al.* 1994: 198). Given such differences between the environments of the billabongs and the rivers, it is not surprising that billabongs support different species of mussels, yabbies and tortoises from the main river channels (Geddes 1990; Walker 1990). Billabongs and floodplains are also known to be crucial for the spawning and breeding of some species of native fish because of their high biomass of plankton (Cadwallader & Lawrence 1990).

Floodplains are one of the special natural features of our lands and consist of extensive forests of River Red Gum next to the parent rivers that become flooded regularly. Within the Yorta Yorta lands, the most important of these are the Barmah-Millewa forests, Gunbower Forest, the lower Goulburn River and the lower Ovens.

Under natural regimes, these floodplains flooded almost every year in winter and spring (Bren 1990), and generated vast quantities of plankton and larger invertebrates, which then provided abundant food for native fish, tortoises and waterbirds (Briggs 1990; Cadwallader & Lawrence 1990). Now, because of river regulation, there are fewer small flood events and fewer large flood events (Cadwallader & Lawrence 1990), leading to significant changes in this environment (Bren 1990; Cadwallader & Lawrence 1990).
The box woodlands were once the most extensive environment within the Yorta Yorta lands, covering approximately 80% of the total area (Robinson 1998). Now, however, only 1% of their former extent remains (Robinson 1998). The box woodlands were dominated by Grey Box *Eucalyptus microcarpa* but also included other trees such as Yellow Box *Eucalyptus melliodora*, Black Box *E. largiflorens*, Buloke *Allocasuarina luehmannii* and White Cypress-pine *Callitris glaucophylla*.

Importantly, box woodlands contain many different species of understorey and groundcover plants from the red gum forests (Foreman 1995; Robinson & Mann 1996), such that they provide a very different suite of foods and habitats from the red gum areas. For instance, although the endangered Superb Parrot *Polytelis swainsonii* breeds in the red gum forests of Barmah-Millewa and along the Edward River, its main foraging area is the nearby box woodlands (Webster 1988). Studies done along the Broken Creek also found that Brush-tailed Possums *Trichosurus vulpecula* and Ring-tailed Possums *Pseudocheirus peregrinus* were both much more common in box trees than in river red gums where both tree species were present (D. Robinson, pers. comm.). Finally, some of the plant species known to be used by our people, such as Ruby Saltbush, Creeping Saltbush, Golden Wattle, Buloke, Berrigan, Sandalwood and Native Willow, grow only in box woodlands and not the red gum forests.

Although most of the box woodlands occurred on the plains, significant areas also covered some of the ridges within the red gum forests. These areas thus provided important local variations in the natural environment, as well as refuge sites in the case of flood. Now, because of the clearing of most box woodlands out on the plains, these box ridges within the red gum forests represent some of the largest remaining examples of box woodlands in the eastern Northern Plains (Robinson 1998).

Sandhill environments comprise source-bordering dunes and lunettes developed during the last Ice Age (>10,000 years ago). Although rare within the general landscape, sandhills are (or were) extremely special places which supported unique assemblages of animals and plants. For instance, one sandhill in Gulpa State Forest contains one surviving specimen of Silver Banksia *Banksia marginata*, a plant that is otherwise extinct in the Yorta Yorta lands. Sandhills were also good areas for wombats (Bossence 1979: 215) and a few of these still survive today on the north side of the Murray (D. Robinson, pers. comm.).

Ranges are rare in the Yorta Yorta lands, occurring only along the eastern boundary. The most prominent is the Warby Range, a 7000 ha granite intrusion in the Murray Basin which is characterised by steep to moderate escarpments rising to 540 m a.s.l, large rocky outcrops and undulating plateau areas. Water sources in the Warby Range include runoff streams and springs, and waterfalls are numerous. The vegetation and fauna of this Range is distinctively different from that of the red gum forests and box woodlands, characterised as it is by plants associated with granite and with higher rainfall. Of the animals found in this Range and the nearby Chesney Hills, probably the most significant is the Carpet Python.

Closely associated with the Warby Range is the 3,500 hectare Killawarra Forest at the north end of the Range. In contrast with the Warby Range, however, the Killawarra Forest occurs on low sedimentary hills and supports a forest of Mugga Ironbark and box. These forests flow with
nectar in the winter months and attract thousands of nectar-feeding birds. Because of this abundant supply of food, it is likely that our ancestors visited the forests at this time to feed on the nectar, as has been documented for ironbark forests elsewhere in Victoria (ECC 1997).

4.1.3 Native Vegetation

Although more than 80% of the former extent of native vegetation has been cleared for agriculture in our lands, the lands still contain extremely important remnants of native vegetation; for example the Barmah-Millewa Forests, Gunbower-Perricotta Forests, Warby Range, Killawarra Forest, lower Goulburn River, Ovens River, Chesney Hills and Broken Creeks system (LCC 1983; Sherwin 1996; ECC 1997; Robinson 1998).

Some of these areas support plants found nowhere else in the region. The Warby Range, for example, contains one of only two Victorian populations of the Spur-wing Wattle *Acacia triptera* (Sherwin 1996). Gulpa State Forest supports the only remaining stand of Silver Banksia. Barmah Forest contains four species of plant not known from anywhere else in Victoria (Robinson 1998). Gunbower Forest contains a population of the nationally endangered Winged Pepper-cress and the Broken Creeks system supports two species of plants not found elsewhere in Victoria (Robinson 1998).

Total plant lists are not available for the whole of the Yorta Yorta lands. However, plant species’ lists have been made for particular areas. In Barmah Forest, nearly 400 species of native plants have been recorded (K. Ward, pers. comm.). Along the Broken Creeks system, nearly 300 native species have been seen, with 140 species found at just one small box woodland reserve at Katamatite (Robinson & Mann 1996).

Of these known plant species, more than 100 are classified as threatened in Victoria (ECC 1997; Robinson 1998) and many others are regionally rare. For instance, a description of the landscape at Dunbulbalane, Victoria, in the late 1800s stated ‘*The country originally was very beautiful in the Spring. In the paddocks left in their original state there were Murray pines, black and golden wattles, other small wattle scrub, grey box and red gum trees, buttercups, harbingers of spring, rice flowers (Pimelea), swamp peas, brilliant purple peas, which we called wild violets, everlasting, blue bells, chocolate flowers, billy buttons, and many orchids including spider, snake and sun orchids, greenhoods, blue and pink fairies. There were kangaroos, koalas, wallabies, possums, native cats, big goannas, with innumerable birds particularly water birds. It was indeed a lovely land in those early days’’ (Rudd undated). Now, all of the orchids have disappeared from that region, as have the wallabies, koalas and native cats.

Around Barmah Forest, there is likewise evidence of declining plant species. Ruby saltbush is found in black box communities on nearby roadsides but is no longer found in similar communities on the forest margin. Bulbine lily was previously known from the forest but could not be located during this survey. Only one known plant remains of the Scented Mat-rush, with its nearest relative approximately 1 km away on a roadside margin. The Quandong previously grew in the forest (Wally Cooper pers. comm.) but has now disappeared. And only one very small population of the once more abundant Sweet Leek-orchid was found in the Forest during the study.
4.1.4 Fauna

Because of the vast expanses of wetlands in the Yorta Yorta lands, this area supports a very diverse and abundant fauna. Most importantly, it is (or was) a critical area for breeding waterbirds, supporting thousands of nesting ibis, egrets, herons, Magpie Goose, Whiskered terns, cormorants, Darters, spoonbills and ducks. For instance, early European observers made the following observations of birds in Barmah Forest:

“As characteristic of the Moira….. it abounded beyond all belief in unusually fat fish, swarmed with leeches and snakes, and the ducks were so numerous that I cannot tell how many [could be] bowled over at one shot.” (Curr’s recollection of the Moira Lake at the time of European settlement in the early 1840’s).

“The moist tract in the center of the lake [Barmah Lake] is covered with Australian Crane or Native Companions [Brolga], resembling sheep in a paddock. They are unsettled and are coming from the Moira Lake on the New South Wales side in companies of about a score, filling the morning air with split trumpet like cries.” (from Field Outings on the Murray Frontage by field naturalist, The Australian, April 29, 1898).

“In about four or five miles [from Barmah] we came across the Moira Lakes – a veritable inland sea ……… Waterfowl of every species, both common and rare, were to be seen……. There are plenty of swan and duck, ibises and cranes, and numberless other waterfowls.” (Recollections from a paddle steamer trip, Nathalia Herald, 13 November 1900).

“Next to ibises, marsh terns were most numerous, though compared with the “sickle bills” they seemed but a few strayed birds. Yet there were several thousands of the whiskered [terns], their realm the lake, golden with lily blossoms or green with floating Moira Grass” (from Wildlife on Inland Waters by Charles Barrett 1931).

“You looked out of the tents in the early morning and saw not hundreds but tens of thousands. Ducks – teal, black duck, shoveller duck and wood duck to mention only the common kinds; black swans in hundreds and more hundreds.......... To visualise these miriads you might imaging Sydney Harbor not covered but packed with swimming birds – and then broaden it till the farther shores were nebulous.” (from Murray Picnic by Ray Harris 1944). (all records, pers. comm. Keith Ward).

Even up to the 1970s, the number of waterbirds breeding in Barmah was vast, comprising up to 100,000 ibis, thousands of egrets and hundreds of night-herons, ducks and cormorants (Chesterfield et al. 1984).

Altogether, more than 200 species of birds have been identified around Barmah Forest. Importantly, 158 of these species are known to breed in this area. Some birds, such as grebes, bittern, ibis, swan, most ducks, rails, cranes, water-hens, coots, brolga, grassbird and cisticola, construct nests directly on the water and in the reed beds (Chesterfield et al. 11984). Others,
including ducks, falcons, cockatoos, parrots, owls, kingfishers and treecreepers require tree
hollows. Of these latter species, the most notable found in the area is the Superb Parrot; a
nationally threatened species of parrot which only nests in the hollows of very large River Red
Gums (Webster 1988). One of the major strongholds of this bird is the Barmah-Millewah
Forests (Webster 1988).

Kangaroos, wallabies, emus, possums, echidnas, bandicoots, native cats and native rodents once
occurred throughout our lands. All of these animals used to be hunted by Yorta Yorta but most
of them have now disappeared or become very rare (Robinson & Mann 1996). In the dryland
rats’ and perhaps stick-nest rats all once occurred but have since disappeared (Curr 1883;
burial places in Barmah being ‘perforated by rats...’ (Hibbins 1991, p. 8) also hints of a species
of native rodent. On the grassy plains close to Barmah, Brolgas sometimes occurred in their
hundreds (Hibbins 1991, p. 111, 132) and emus were common.

Other wildlife groups are also common. Terrestrial reptiles identified in our area include a
variety of snakes, skinks and geckos, including the threatened Carpet Python along the Murray
River, in the Warby Ranges and in the Chesney Hills. Altogether, 27 species of reptile,
including three tortoise species, have been found just in Barmah (K. Ward, pers. comm.). Ten
species of frog have also been found here, including the Giant Bull-frog, an animal classified as
endangered in Victoria.

Again, however, reptiles are known to be less abundant than formerly. As noted by Keith Ward,
from DNRE with regard to Barmah Forest, ‘An account from 1861 noted that it was not unusual
to kill more than 50 snakes per day whilst looking for frogs for fish bait. And a picture taken in
1913 shows 112 Tiger Snakes paraded on a fence line, all caught within a 2-hour period of the
photographer arriving from Melbourne. A former Barmah Forest forester recalled similar
stories of himself killing numerous snakes on an average day during the course of his work.
Today, very few snakes can be found within the forest’ (K. Ward, pers. comm.).

The waterways within Yorta Yorta lands contain (or contained) a rich variety of aquatic fauna,
much of which was procured by our people. Many (c. 20) native species of fish inhabit (or
inhabited) the waterways in Yorta Yorta lands. In 1853, Sir Henry Young, the then Lietenant
Governor of South Australia, noted of the Murray River near Barmah that it ‘abounds in fish of
several kinds of which the Murray Cod, weighing sometimes seventy pounds, is not only the
biggest but the best. The malloway, a species of cod, furnishes useful isinglass and good oil.
The lagoons and backwaters of the river teem with crayfish and are the resort of innumerable
wildfowl’ (Bosssence 1979, P.41). In 1889, another observer similarly commented that ‘on many
occasions I have seen three and four hundred-weight of fish drawn from lagoons at single hauls,
consisting of cod, perch, blackfish and turtle’ (Cadwallader & Lawrence 1990). Such was the
abundance of fish along the Broken Creek and Murray River, indeed, that, every week in the
early 1900s, an average of 15 buckets containing about 100 pounds of fish each, left the Nathalia
and Echuca railway stations for the Melbourne markets (Hibbins 1978, p. 137).
Not only were fish plentiful in the rivers and creeks of the Barmah-Millewa wetlands but many species were large. The Murray Cod *Maccullochella peeli* was by far the largest fish in these waters, with individuals weighing as much as 100-110 kg caught by our people. Other species such as the Silver Perch *Bidyanus bidyanus*, Freshwater Catfish *Tandanus tandanus* and Golden Perch *Macquaria ambigua* were substantially smaller, although individuals weighing between 1-5 kg were common for each of these species.

As indicated by the above, historical accounts, other species of aquatic animal also flourish in the various wetlands of the area, particularly prior to European contact. Freshwater and River Mussels both live in the area, as do Murray Crayfish and yabbies. Leeches once were so common that ‘In the mid-1800s, more than 120 000 were exported to London. Another 250 000 leeches were sent from Moira Lake to Melbourne in 1880 under one contract alone! Since 1970, however, numbers have declined dramatically, probably as a result of changed habitat structure and prey availability’ (K. Ward, pers. comm.).

Despite these many changes wrought to the wildlife and habitat since European occupation, the Barmah-Millewa Forests, Gunbower-Perricoota Forests, Lower Goulburn, Lower Ovens, Warby Range and other large remnants of native vegetation all remain critical as wildlife habitat (Robinson 1998). For example, Barmah Forest alone contains 51% of all threatened species of animals and plants still found in the eastern Northern Plains, including 11 species found nowhere else in the region. These threatened species include 37 types of plant, 27 species of terrestrial animal and nine species of fish. The Barmah-Millewa Forests also include examples of at least 13 different vegetation types, making them extremely diverse forests for a whole range of wildlife (Robinson 1998). Other places are just as distinctive, however. For example, the Broken Creeks system provides representation of four vegetation communities and 19 threatened species of wildlife not found in Barmah Forest (Robinson 1998). All of the places in our lands thus have their own unique natural and cultural heritage.

### 4.2 NATURAL AND CULTURAL HERITAGE

#### 4.2.1 Ethnographic sketch

Most information about the Aboriginal groups who lived in, and adjacent to, the study area comes from the diaries of early European explorers and settlers. These accounts describe Aboriginal lifestyles as they existed from about 1820-1860. However, it must be emphasised that European presence had already had profound effects on the groups being described and that the following accounts are of groups in transition.

By chance, one of the most extensive and detailed historical descriptions of Aboriginal groups within a relatively small region along, and adjacent to, the Murray River includes our area. This is the work of Edward M. Curr (1883), the first European squatter in the region. Recently, the accuracy of Curr's work has been called into question (Barwick 1984), on the grounds that Curr's interest in ethnography did not begin until 1872 and that his accounts of Victorian aboriginal groups were based on the memories of "old settlers" rather than his records on the 1840s. In the late nineteenth century, Curr was also ridiculed about his “ignorance of Aborigines", a campaign
of humiliation which led to his resignation from the Board for the Protectorate of the Aborigines in 1883.

It is beyond the scope of this report to determine whether those who chose to ridicule Curr in the late nineteenth century were in fact more knowledgable than Curr about aborigines or whether more political motives were involved. Curr’s recollections of Aboriginal life are therefore included as one of the ethnographic sources used to reconstruct the Yorta Yorta’s traditional life.

4.2.1.1 Social organisation

Curr identified the Aboriginal population in and around his stations as the Bangerang. Based largely on linguistic data, Tindale (1974) identified three specific groups within this same area. These are the Joti Joti (Yota Yota), Kwat Kwat and Pangerang.

Curr described the male Aborigines he observed along the Goulburn River as “muscular active men, two out of three being about 5’9” [175 cm]. They wore possum skin cloaks and had necklaces of small reeds hung on twine made from wild flax. They had kangaroo skin bags used to carry shields, waddies and utensils and carried their spears and throwing sticks in their hands” (1883:85).

Common to hunter-gatherer groups, the family was described as the basic socioeconomic unit. According to Curr (1883:248, 253-254), a family consisted of a senior male, one or more wives, young boys of ages of up to 10 years, and girls of up to 14 years (the age when they left to be married). Additionally, older relatives may also be present. It is difficult to ascertain the average size of these families.

The family unit camped together, sharing the same hearth and shelter (Curr 1883:244), although groups of families were also observed camping together (Curr 1883:255). It is unclear from Curr's accounts how local Aboriginal society was organised above the family unit. On a regional level, Curr recognised several "tribes" inhabiting the study area and adjacent areas. He specifically defined the tribe as consisting of a “…number of men closely allied by blood and living in the strictest alliance, offensive and defensive, who, with their wives and children, occupy practically in common and to the exclusion of all others, a tract of country which they claim as their own’ (1886:61)

4.2.1.2 Settlement

Sturt stated that the Aborigines in the general Murray Valley did not occupy river margins in great numbers. He observed that while Europeans closely followed the course of the river, the Aborigines did not:

*It would...appear that the tribes do not generally frequent the river. They must have a better country back from it, and most probably linger amongst the lagoons and creeks where food is more abundant. The fact is evident from the want of huts upon the banks of the Murray and the narrowsness of the paths along its margin (1833:196).*
A common perception of the traditional view of Aboriginal life along the Murray is that groups were seasonally mobile, their moves dictated by the flooding regimes of the Murray. Strongly implied in this scheme is that these moves required the relocation of base camps, though it is unclear what distances were involved.

By contrast with that perception, Curr stated that the *Wongatpan* were almost sedentary within the Moira marshes. They "seldom left the banks of the Murray and the swamps and reed beds of its immediate vicinity" (Curr 1883).

More implicit suggestions of territories are found in the accounts of the early European settlers in this region. For example, in 1842, when Peter Stuckey located his station house on the banks of Gulpa Creek, he met active, open resistance to his presence by the local Aborigines and was forced to relocate onto the top of the Cadell Tilt (where the Township of Mathoura now sits) (Bushby 1980:178). Though not explicitly stated, it appears that the Aboriginal opposition to Stuckey's presence decreased after this move, suggesting that Stuckey had moved out of their primary territory.

Nevertheless, oral accounts by our people indicate that our ancestors did move seasonally to use different food sources. In the colder and wetter months, Yorta Yorta people camped on the high ground and gathered food in the swampy areas. In summer, tribes moved back to camp alongside permanent water. At this time of year abundant food was available both near the camp (cumbungi, mussels, fish, eggs) and in the box woodlands on higher ground (possums, fruits). Tribal meetings were held during spring and summer when the food was plentiful and could support large gatherings of people. The Barmah Lakes were a favourite meeting place (Des Morgan Snr. pers. comm., Atkinson and Berryman 1983, Curr 1883).

4.2.1.3 Subsistence strategy and technology

Hunting, fishing (including shellfish collection) and plant collecting were primary food-procuring activities of our people within and around the forests. Reading the nineteenth century descriptions of these activities one is struck by the apparent abundance of resources available within the Barmah-Millewa wetlands. Hunting and fishing strategies were varied but due to the high densities of local animals a high volume return was all but guaranteed.

Fishing and shellfish collecting were major activities of the Aborigines within the Murray Valley. Mitchell (1839) observed Aborigines collecting shellfish (mussels) along the Murrumbidgee. He noted that they were able to extract these shells even from dry areas. Fish and freshwater mussels could also be found away from the rivers, in the lakes and lagoons.

Curr (1883:240-242) mentions a variety of fishing methods among our ancestors. These include the use of weirs, nets, spears and poison.

Fishing was a major activity within the forest and several items were made and used in procuring aquatic resources. A variety of fibre nets were used to catch fish, the mesh size varying according to the type of fish sought. As the river fell, weirs and dams were constructed in order
to create small reservoirs in which fish became trapped. These were then taken by nets or spears. Line fishing may have also been practised.

Canoes were an important element in our fishing. Eyre mentions the practice of night fishing where the fish were attracted by the light of the fires (torches?) in the canoes. When they came to the surface they were speared.

Curr (1883:88-91) describes the process of canoe making. This process took about 30 minutes and involved selection of a suitable tree, cutting the outline and peeling away the bark.

“a few notches were cut with the tomahawk, one above the other, in its bark just outside of what was to be its edge, or gunwale of the canoe. The operator having then roughly marked out on the tree the lines of his vessel, commenced cutting the bark along them with his tomahawk down to the wood, so as to detach from the tree an unbroken sheet of bark, which would be the canoe. To effect this the tree was ascended gradually, by placing the big toe in the notches before mentioned, which were used as steps, the Blackfellow holding on with one hand, whilst he plied the tomahawk with the other hand. He also, I remember, assisted himself by rearing against the tree a stout branch which happened to be at hand, whilst he chopped. The bark thus cut all round, it only remained to detach it from the tree, to which it still adhered. This was effected, as the sap was not well up, and the bark clung to the wood, by hammering the future canoe gently with the butt of the tomahawk, and by forcing the end of a pole here and there under the edges of the bark and prizing steadily. Gradually, in this manner, it was neatly detached from the tree. The canoe being a heavy one, my sable friends then produced a cord which they passed round the centre of the canoe and round the tree, and then tied somewhat loosely, in order to prevent the canoe from coming down with too much violence. The last bit of bark by which it was suspended was then severed, and the little skiff gently lowered to the ground”.

After the bark was removed, the sap was dried by setting a fire under the overturned canoe. This process not lasting more than a few minutes allowed the wood to be properly "shaped". At the conclusion, this canoe, measuring slightly more than six metres, would float about 20 centimetres above the water and could hold as many as five people.

The use of canoes during high water levels greatly extended the range of area which could be exploited and, thus, increased the amount of food that could be gathered. Frogs, water rats, lizards, turtles and snakes were also collected from canoes.

Fishing weirs were a common feature used by the Aborigines in the Barmah-Millewa wetlands. In contrast to the extensive, stone-lined weirs documented along the Darling River, the weirs used in the study area consisted of wooden stakes placed in an artificially-created earthen bank. These were usually constructed at or near the junction of small creeks and major waterways (Murray and Edward Rivers, Gulpa Creek); these small creeks only flow during floods. Curr (1886:65) noted that among the Bangerang weirs, as indeed the creeks upon which they sat, were owned by individuals. Local oral tradition, cited by Bonhomme (1990), states that fish traps were built at the narrow end of a lagoon, providing a steady supply of fish, often for several months at a time.
Much of the hunting was done using fibre nets varying in weight and mesh according to the animals hunted. Birds, kangaroos, wallabies and emus were captured by netting. Hunting the larger animals often involved a group effort. As Beveridge (1889:74-75) described, emus were often captured by herding them into large nets up to 80-100 yards (73-91m) long with a mesh of about 6 inches (15 cm).

The use of nets is well-documented in the study area as well as at many other places along the Murray. These nets, which vary in overall size and mesh are made from aquatic plants (e.g., *Typha* spp., *Juncus* spp.). Morey (1907:Nov 1375) observed a group of Aboriginal women at Lake Benanee (roughly 300 kilometres west of the Barmah-Millewa wetlands) who were softening plant stems by chewing them. When the stems were pliable they were "twisted into a coarse line". This cordage was subsequently woven into nets.

Though weirs and nets may have been the primary methods of capture, Curr (1883:240-241) also noted, during periods "when the river was not discoloured by floods", the Bangerang would "enter the water with short barbed spears". It is unclear from his description how this spearfishing method operated and who was doing the fishing (i.e., males only, females only or both).

Spears, made of various sizes of strong reeds and wood, were used by our people for hunting. The size of the spear varied with its function; spears for fishing were about 1.5m long (Beveridge 1889:63) while those used on land animals (and, presumably warfare) were longer, usually about 2.5m (Beveridge 1889:61). Reed spears must have been useful since they were traded over a wide area (see Exchange section).

The edges of stone flakes (which do not occur naturally within the Barmah-Millewa forests and are found only rarely at sites within the forests) and mussel shells were used as implements for cutting and scraping. Curr (1883) noted that sharp edges of reeds were also used as knives in the butchering of animals. Edge ground axes, used in the process of removing bark from Red Gum and Box trees, are also present although, like chipped stone items, these were imported into the forest. Other stone tools include pestles and grindstones.

Possums were caught in large numbers and their skin was valued for cloaks. Hunting of these animals was relatively simple, usually consisting of cutting them from their lairs within trees. According to early European observers, Aborigines could, and did, often capture as many as 50 possums a day (Penney 1979:17).

Kangaroos, wallabies and emus were stalked and speared or netted. This was a group activity often involving an extended period of time. While Dingoes were plentiful their numbers quickly decreased after European settlement as poisoning and hunting of these dogs began.

The artefactual assemblage produced and used by our ancestors is poorly known. Most of the items produced in the forests were made from local resources, primarily fibres, wood and bark. Local stone sources were absent; the presence of chipped, and, in particular, ground stone axes,
reflects the presence of the extensive exchange system in which the people of the Barmah-Millewa forests participated.

Bickford (1966) notes that a wide variety of material cultural items (" Implements used to procure food") had been observed being used by the Aborigines in the Echuca/Moama area. Most of these were manufactured from wood, though plant fibre and stone implements were also listed (Table 2).

Table 2. Source Materials for Cultural Materials Used in the Central Murray Region

<table>
<thead>
<tr>
<th>Implement</th>
<th>Material</th>
</tr>
</thead>
<tbody>
<tr>
<td>Net for catching fish</td>
<td>Fibre</td>
</tr>
<tr>
<td>Net for snaring ducks</td>
<td>Fibre</td>
</tr>
<tr>
<td>Portable screen on boughs</td>
<td>Wood</td>
</tr>
<tr>
<td>Canoe</td>
<td>Wood</td>
</tr>
<tr>
<td>Weirs</td>
<td>Wood/Soil</td>
</tr>
<tr>
<td>Spear/Woomera</td>
<td>Wood</td>
</tr>
<tr>
<td>Short fishing spear</td>
<td>Wood</td>
</tr>
<tr>
<td>Club</td>
<td>Wood</td>
</tr>
<tr>
<td>Axe</td>
<td>Stone (imported)</td>
</tr>
<tr>
<td>Digging stick</td>
<td>Wood</td>
</tr>
<tr>
<td>Hook for digging grubs</td>
<td>Wood</td>
</tr>
</tbody>
</table>

4.2.1.4 Plant procurement and processing

Like the fauna, plant resources in the Barmah-Millewa forests were abundant, stable and predictable.

Reed beds were an important location for plant foods, especially the Bullrush or Cumbungi, *Typha orientalis; T. domingensis*, which grows abundantly on the marshes. Curr (1883) noted that the reed beds were maintained by the Yorta Yorta through burning. He stated that reed beds often varied in colour "in accordance with their ages and the periods at which they had last been burnt."

Several parts of the *Cumbungi* were used, all rich in carbohydrates. Gott (1981) states that although the bullrush was dependent upon floodwaters, it was less seasonal than fruits and seeds and would persist for more than one season. She also presents an important observation by Mitchell and Krefft (1865), who stated that the rhizome of the *Cumbungi* was stored "to some extent". Unfortunately, no quantification was provided as to whether the storage was short-term, long-term, or indeed occurred at all.

In addition to Cumbungi, we also use, or used, many other species of plants for food or medicine. Those plants known to be used at least historically are listed in Tables 3 and 4. Many of these plants are also used today for various purposes, as described in Appendix 2.
Table 3. Medicinal Plants Collected In The Central Murray Region

<table>
<thead>
<tr>
<th>Botanical Name</th>
<th>Common Name</th>
<th>Portion Used</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acacia pycnantha</td>
<td>Golden Wattle</td>
<td>Gum dissolved</td>
</tr>
<tr>
<td>Amyema</td>
<td>Mistletoe</td>
<td>Leaves bruised in water and drunk for fevers</td>
</tr>
<tr>
<td>Centipeda cunninghamii</td>
<td>Old Man Weed</td>
<td>Leaf boiled. Used for colds, coughs, wash sores; contraceptive</td>
</tr>
<tr>
<td>Chamaesyce drummondii</td>
<td>Flat Spurge</td>
<td>Leaf and stem boiled for genital disease; sores and itch</td>
</tr>
<tr>
<td>Eremophila longifolia</td>
<td>Berrigan</td>
<td>Leaves boiled for burns and diarrhoea</td>
</tr>
<tr>
<td>Eucalyptus camaldulensis</td>
<td>River Red Gum</td>
<td>Gum for burns and diarrhoea</td>
</tr>
<tr>
<td>Exocarpus cupressiformis</td>
<td>Native Cherry</td>
<td>Sap for snakebite</td>
</tr>
<tr>
<td>Geranium</td>
<td>Crane's Bill</td>
<td>Root</td>
</tr>
<tr>
<td>Gnaphalium luteo-album</td>
<td>Jersey Cud-weed</td>
<td>Leaf boiled as drink for general sickness</td>
</tr>
<tr>
<td>Goodenia</td>
<td>Goodenia</td>
<td>Leaf used to induce sleep in babies</td>
</tr>
<tr>
<td>Mentha australis</td>
<td>River Mint</td>
<td>Leaf boiled, used for coughs/colds</td>
</tr>
<tr>
<td>Myoporum platycarpum</td>
<td>Sugarwood</td>
<td>Resin for laxative</td>
</tr>
<tr>
<td>Sonchus oleraceus</td>
<td>Sow Thistle</td>
<td>Leaf, stem eaten raw to induce sleep</td>
</tr>
</tbody>
</table>

Adapted from Lyons (n.d.) based on unpublished works of Gott.

Table 4. Food Plants in the Central Murray Region Forests

<table>
<thead>
<tr>
<th>Botanical Name</th>
<th>Common Name</th>
<th>Portion Used</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acacia pycnantha</td>
<td>Golden Wattle</td>
<td>Gum dissolved for drinks</td>
</tr>
<tr>
<td>Amyema</td>
<td>Mistletoe</td>
<td>Fruit</td>
</tr>
<tr>
<td>Angiullaria dioica</td>
<td>Early Nancy</td>
<td>Root (corm)</td>
</tr>
<tr>
<td>Arthropodium minus</td>
<td>Small Vanilla-Lily</td>
<td>Root tuber</td>
</tr>
<tr>
<td>Atriplex spp.</td>
<td>Saltbush</td>
<td>Seed ground and cooked</td>
</tr>
<tr>
<td>Boerhavia diffusa</td>
<td>Tar Vine</td>
<td>Tap root cooked</td>
</tr>
<tr>
<td>Brachychiton populneuse</td>
<td>Kurrajong</td>
<td>Seed cooked</td>
</tr>
<tr>
<td>Bulbine bulbosa</td>
<td>Bulbine Lily</td>
<td>Root cooked</td>
</tr>
<tr>
<td>Calystegia sepium</td>
<td>Large Bindweed</td>
<td>Root cooked and pounded</td>
</tr>
<tr>
<td>Cardamine spp.</td>
<td>Bitter Cress</td>
<td>Leaf and stem</td>
</tr>
<tr>
<td>Causuarina spp.</td>
<td>Sheoak</td>
<td>Young shoots and female cones</td>
</tr>
<tr>
<td>Chenopodium spp.</td>
<td>Goosefoot</td>
<td>Seed ground</td>
</tr>
<tr>
<td>Convolvulus erubescens</td>
<td>Blushing Bindweed</td>
<td>Root cooked, Leaves steamed</td>
</tr>
<tr>
<td>Dichopogon spp.</td>
<td>Chocolate Lily</td>
<td>Root tuber</td>
</tr>
<tr>
<td>Eucalyptus camaldulensis</td>
<td>River Red Gum</td>
<td>Seed</td>
</tr>
<tr>
<td>Eucalyptus largiflorens</td>
<td>Black Box</td>
<td>Seed soaked, dried, ground</td>
</tr>
<tr>
<td>Exocarpus strictus</td>
<td>Dwarf Cherry</td>
<td>Fruit</td>
</tr>
<tr>
<td>Exocarpus cupressiformis</td>
<td>Native Cherry</td>
<td>Fruit</td>
</tr>
<tr>
<td>Geranium spp.</td>
<td>Crane's Bill</td>
<td>Root cooked</td>
</tr>
<tr>
<td>Glycine tabacina</td>
<td>Variable Glycine</td>
<td>Taproot</td>
</tr>
<tr>
<td>Hypochaeris glabra</td>
<td>Smooth Cats'Ear</td>
<td>Taproot</td>
</tr>
<tr>
<td>Hypoxis spp.</td>
<td>Yellow Star</td>
<td>Root (corm)</td>
</tr>
<tr>
<td>Lepidium spp.</td>
<td>Pepper-cress</td>
<td>Stem and Leaves steamed</td>
</tr>
<tr>
<td>Linum marginale</td>
<td>Native flax</td>
<td>Seed</td>
</tr>
<tr>
<td>Plant Name</td>
<td>Common Name</td>
<td>Use(s)</td>
</tr>
<tr>
<td>------------------------------------------------</td>
<td>--------------------------</td>
<td>------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Mentha australis</td>
<td>River mint</td>
<td>Leaf for food flavouring; used to line ovens</td>
</tr>
<tr>
<td>Microtis spp.</td>
<td>Onion orchid</td>
<td>Root tuber</td>
</tr>
<tr>
<td>Muehlenbeckia florulenta</td>
<td>Lignum</td>
<td>Seed ground to flour</td>
</tr>
<tr>
<td>Myoporum platycarpum</td>
<td>Sugarwood</td>
<td>Manna contains sugar</td>
</tr>
<tr>
<td>Oxalis perennans</td>
<td>Yellow wood-sorrel</td>
<td>Leaves; Tuberous taproot</td>
</tr>
<tr>
<td>Paspalidium jubiflorum</td>
<td>Warrego grass</td>
<td>Seed ground to flour, cooked</td>
</tr>
<tr>
<td>Phragmites australis</td>
<td>Common Reed</td>
<td>Young shoots, roots</td>
</tr>
<tr>
<td>Picris hieracioides</td>
<td>Hawkweed</td>
<td>Root</td>
</tr>
<tr>
<td>Pittosporum phylliraeoides</td>
<td>Native Willow</td>
<td>Seed pounded</td>
</tr>
<tr>
<td>Polygonum hydropiper</td>
<td>Water Pepper</td>
<td>Stem roasted, peeled</td>
</tr>
<tr>
<td>Polygonum plebium</td>
<td>Small knot-weed</td>
<td>Seed ground, cooked</td>
</tr>
<tr>
<td>Portulaca oleracea</td>
<td>Common Purslane</td>
<td>Seed ground, root and leaf also eaten</td>
</tr>
<tr>
<td>Prasophyllum spp.</td>
<td>Leek Orchid</td>
<td>Root tuber</td>
</tr>
<tr>
<td>Rhagodia spp.</td>
<td>Saltbush</td>
<td>Fruit</td>
</tr>
<tr>
<td>Rorippa spp.</td>
<td>Marsh Cress</td>
<td>Leaf</td>
</tr>
<tr>
<td>Salsola kali</td>
<td>Prickly Saltwort</td>
<td>Seed ground to flour</td>
</tr>
<tr>
<td>Sida corrugata</td>
<td>Variable Sida</td>
<td>Seed ground, made into paste, cooked</td>
</tr>
<tr>
<td>Solarum esuriale</td>
<td>Quena</td>
<td>Fruit</td>
</tr>
<tr>
<td>Sonchus oleraceus</td>
<td>Sow Thistle</td>
<td>Stem, Leaf</td>
</tr>
<tr>
<td>Triglochin procera</td>
<td>Water Ribbons</td>
<td>Root tuber roasted</td>
</tr>
<tr>
<td>Typha</td>
<td>Cumbungi/Bullrush</td>
<td>Root (Rhizome) steamed in oven or roasted</td>
</tr>
<tr>
<td></td>
<td>Young shoots eaten raw</td>
<td></td>
</tr>
</tbody>
</table>

Adapted from Lyons (n.d.:Appendix D) based on unpublished work of Gott.

4.2.1.5 Use of Fire

Edmund Curr wrote of the use of fire in the study area: 'I refer to the fire-stick; for the blackfellow was constantly setting fire to the grass and trees, both accidentally, and systematically for hunting purposes. Living principally on wild roots and animals, he tilled his land and cultivated his pastures with fire; and we shall not, perhaps, be far from the truth if we conclude that almost every part of New Holland was swept over by a fierce fire, on an average, once in every five years. That such constant and extensive conflagrations could have occurred without something more than temporary consequences seems impossible, and I am disposed to attribute to them many important features of Nature here; for instance, the baked, calcined, indurated condition of the ground so common to many parts of the continent, the remarkable absence of mould which should have, resulted from the accumulation of decayed vegetation, the comparative unproductiveness of our soils, the character of our vegetation and its scantiness, the retention within bounds of insect life (notably of the locust, grasshopper, caterpillar, ant and moth), a most important function, and the comparative scarcity of insectivorous birds and birds of prey. They must also have had an influence on the thermometrical range, and probably affected the rainfall, and atmospheric and electrical conditions (Curr, 1965:Chapter 3).
When these circumstances are weighed, it may perhaps be doubted whether any section of the human race has exercised a greater influence on the physical condition of any large portion of the globe than the wandering savages of Australia.

4.2.1.6 Exchange

Given the abundance of resources, it is not surprising that the forests in the Barmah-Millewa region were a centre of exchange activities between our people and other tribal groups. McBryde (1984) indicates that the Barmah area was a meeting area where exchange was recorded in the 1840s. She concludes that "large intergroup gatherings seem to have been a prominent feature of the life of societies in the southeast" (McBryde 1984:139). She also indicates movements of some materials (i.e., reeds and reed spears) southwards from the Moama-Barmah area and stone being imported from that direction (McBryde 1984:Figure 1). There is no indication that goods travelled north of the Murray.

Suitable stone for flaking had to be traded into the forests since few, if any, local lithic sources exist. These stone imports may have been brought in from distances up to 100 km. The greenstone used in the manufacture of edge-ground axes by our ancestors most likely came from the Mt. William/Mt. Camel areas in central Victoria.

Among the items identified by Curr (1883:128) as locally made, several may have been used in trade. These include reed necklaces, red ochre, pipe-clay, armlets of fur, plumes, nasal ornaments of bone and reeds for spears.

4.2.1.7 Ceremonial behaviour

Curr (1883) often commented on the ceremonies being performed within the Moira/Barmah region. These were associated with various aspects of social life such as marriage, tooth avulsion and scarification of the chest, arms and buttocks. In 1874 Mathews established the Maloga Mission Station on land which was once an important gathering place and corroboree ground for local and neighbouring tribes (Cato 1976:28). On the southern, side of the Murray, opposite Maloga, the Madowla Bend was once a meeting and camping place for tribes (Bonhomme 1990).

4.2.1.8 Mortuary behaviour

Burial sites are among the most significant areas to us today. This concern relates to a respect for our dead. Several methods were used by our people to dispose of the dead with internment and cremation being the most common. Burials can occur in middens and campsites where evidence of habitation also occurs. Alternatively, burials of our people also have been found in areas which appear to have been used exclusively for burial (i.e., cemeteries).

Burial behaviour is mentioned in some European accounts. For example, Sturt (in Hibbins 1978:23-24) wrote that between the Edward and Goulburn Rivers,

[T]here are burial places in every sandhill, three of which contained upwards of fifty graves...Many of the graves appear to have been recently tenanted.
He also noted a poorly maintained burial on the sand hill bordering Barmah Lake.

The practice of burying the dead in sandhills was also noted by Hawdon (1952:52) and Curr (1883:312). Beveridge (1883:38-40) stated that burials were also placed in oven mounds.

Curr (1883:286) describes burial practices among our people. He states that,

_The dead were rolled up in these oppossum-rugs, the knees being drawn up to the neck with strings, when the corpse was interred in a sitting position, or on its side, generally in a sandhill, in which a grave about four feet deep had been excavated. A sheet of bark was then placed over the corpse, the sand filled in, and a pile of logs about seven feet long [2.1 m] and two feet [60 cm] wide was raised over all._

### 4.3 ARCHAEOLOGICAL HERITAGE

This section discusses the broad picture of archaeological knowledge for our lands.

#### 4.3.1 Human Remains and Their Place in the Landscape

The presence of human remains within the Murray Valley must have been common knowledge throughout the region, especially this century as large tracts of lands were being cleared for pasture and developed into agricultural areas. The earliest 'archaeological' investigations began very early this century in areas adjacent to the Yorta Yorta Lands. Spencer (1918:118), for instance, reports the presence of human remains in five of the mounds he explored near Koondrook. No other cultural materials were found in these features.

A search for burial grounds along the Murray River and excavation of these remains was conducted by George Murray Black from 1940 to 1954. Although this work resulted in the removal of almost 1000 burials, these were taken from sites to the west of the Yorta Yorta lands. More recently, large-scale regional studies of burials locations have been undertaken along the Murray (e.g., Pardoe 1988, Bonhomme 1987) although they have again not focused directly on areas within the Yorta Yorta lands.

Bonhomme (1987) compiled an overview of burials within the Riverine Plain, extending from the northern (i.e. NSW) side of the Murray. She found that 69 burials sites were recorded from that general region although only three sites (Algeboia, Moira and Moama) fall within the Yorta Yorta Lands.

An archaeological site near the margin of Kow Swamp, located about 50 kilometres west of the study area, has yielded about 40 burials which date between 9000-13,000 years B.P. (Thorne 1976). Many of these burials are notable because of the rugged cranial features they exhibit, quite different from the more gracile cranial features of earlier skeletal remains, dating to about 30,000 B.P., found at Lake Mungo. These 'archaic' features have also been found at sites along the Murray River between Barham and Echuca (Thorne 1976:97).
Lance and Webb (1985) investigated human skeletal material in a large sand dune near the Murray River two kilometres east of Moama. Fifteen skeletons had reportedly been dug from the quarry and reburied at the site by members of the Moama Land Council prior to the archaeologists' arrival.

Additional human skeletal remains, the exact provenance(s) of which is unknown, are held by the Echuca Historical Society. This material has recently been analysed (Howard 1986).

Johnston (1989) reports a burial area along the Edward River exposed during sand quarrying activities by the Mathoura Charcoal operation. This site is located in a low-lying sand dune near the western bank of the Edward River southwest of the Edward Bridge. While no radiocarbon dates were run, Johnston argues that the shallow depths of the burials imply that their internment occurred during a stable period, thus these would date, geologically, to the Holocene, "and probably to the late Holocene" (Johnston 1989:7).

A total of thirteen sites containing human skeletal remains have been recorded in the Barmah-Millewa forests; two sites from the Barmah Forest (Bonhomme 1990) and eleven (11) sites in the Moria-Millewa forests (Craib 1991). The locations of known burial areas within the Barmah-Millewa suggest an intriguing pattern which may be indicative of boundary behaviour (Craib 1991).

Very few radiocarbon dates have been processed from sites within the Yorta Yorta Lands (Table 5). Nevertheless, the small suite of dates which do exist clearly indicate a very long time span for human presence in this region. The earliest dates come from the Kow Swamp area and indicate the presence of people around this area from at least 13,000 years ago, towards the end of the last Ice Age (Pleistocene). The three younger dates are all pre-European contact, dating to between about 500-1200 years ago.

Table 5. Radiocarbon Dates from within the Yorta Yorta Lands

<table>
<thead>
<tr>
<th>Date*</th>
<th>Laboratory Number</th>
<th>Material</th>
<th>Site</th>
<th>Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>13,000+280</td>
<td>ANU-1236</td>
<td>shell</td>
<td>Kow Swamp</td>
<td>Thorne (1975)</td>
</tr>
<tr>
<td>10,070+250</td>
<td>ANU-403b</td>
<td>bone</td>
<td>Kow Swamp</td>
<td>Thorne (1975)</td>
</tr>
<tr>
<td>9,590±130</td>
<td>ANU-532</td>
<td>?</td>
<td>Kow Swamp</td>
<td>Thorne (1975)</td>
</tr>
<tr>
<td>1,130±70</td>
<td>ANU-4850</td>
<td>charcoal</td>
<td>Albegonia</td>
<td>Lance (pers. comm.)</td>
</tr>
<tr>
<td>710±170</td>
<td>ANU-7822</td>
<td>bone</td>
<td>Mulwala</td>
<td>Green (1991)</td>
</tr>
<tr>
<td>510±70</td>
<td>Beta-45046</td>
<td>charcoal</td>
<td>Gunbower Island</td>
<td>Rhoades (1992)</td>
</tr>
</tbody>
</table>

*uncalibrated B.P. (Before Present)

4.3.2 Settlement Patterns
Lyons identified a series of 124 sites from the Moira-Millewa, Werai and Koondrook forests. She noted that mound sites in the Moira-Millewa forests were "often found along the permanent water courses, especially on the outside of stream and river beds where the ground is higher (1988:85). She distinguished between "oven mounds" and "campsites", the latter consisting of a deposit with contents similar to that found at mound sites, however, campsites are "often located on small sandhills where sometimes they are mistaken for oven mounds" (1988:88).

In 1985 Lance (1985) excavated a site west of Algebonia Plain in the Moira forest about two kilometres west of the Murray. This is a large (3500 m²) site sitting on a low-lying sandy area of a box plain about 1500 m from the base of the Cadell Tilt. Sand quarrying activities exposed a deposit up to one metre deep containing a variety of cultural materials including human skeletal remains.

A single 50 cm x 50 cm test pit was excavated in the eastern portion of the site. Shell, animal bone (e.g., kangaroo, fish, tortoise), burned clay and a very few stone flakes were recovered. A single radiocarbon date of about 1100 B.P. was reported. This important site has subsequently been fenced for protection.

Bonhomme surveyed portions of the Barmah Forest in 1988-1989 for the Victoria Archaeological Survey (Bonhomme 1990). This survey covered roughly 10% (280 km²) of the total forest and resulted in the recording of 172 sites. Virtually all (95%) of these sites comprised either scarred trees (n=88; 51%) or mounds (n=76; 44%). Open lithic scatters (n=2) and burial sites (n=1), though present, were extremely rare.

Survey was also undertaken in the Moira, Millewa and Gulpa Island State Forests, located along the northern margin of the Murray River between the townships of Tocumwal and Moama. One hundred and forty-six (146) sites were recorded during the survey. Roughly equal numbers of scarred trees (n=61) and mounds (n=68) were found. Other recorded sites included shell middens (n=15), cemeteries (n=2), Traditional Areas (n=2) and one stone artifact scatter.

Craib (1991:130) found that the presence of sites along river margins was low. Only about 14% of all sites were found along the margins of the Murray and Edward Rivers, and most of these (43%) were scarred trees. Creek margins exhibited the largest numbers of recorded sites; forty-one sites were found in this type of setting, accounting for 28% of all sites. Many sites were also present along lagoons, representing 15% of all sites. Most (82%) lagoon sites were mounds. Sites on floodplains were rare; on average, a site density of one site per 18 hectares was found. An even lower density was recorded from sandhills and Box Plains. In these areas site densities accounted for about one site per 55 hectares.

Cultural deposits with areas larger than 1000m² are rare in the Barmah-Millewa forests. Four have been recorded in the Millewa group, comprising 6% of the cultural deposit sample, while only three mounds (or 3% of the sample) of this size were found in the Barmah forest (Bonhomme 1990:Table 3).

Lomax (1992) surveyed portions of Loch Garry State Forest located 18 km downstream of Shepparton in central Victoria. The forest contains extensive wetlands created by an ancestral
meander loop of the Goulburn River. This survey concentrated on the northern section of the forest around the margins of Loch Garry. Although less than 5% of the total area was surveyed, forty-three sites were recorded. These consisted of 13 "definite Aboriginal scarred trees" (1992: 6), another two scarred trees of "unidentifiable origin" (1992: 6), four Type A ("hummocks or mounds formed by the deposition of sediments largely due to natural processes" 1992:7) mounds, ten Type B ("...of definite cultural origin...have a black silty matrix and contain fresh water mussel shell, burnt clay pellets, charcoal and infrequently stone artifacts" 1992: 7) mounds, eleven stone artefact scatters, two isolated artefacts and one redeposited stone artefact scatter.

Distribution of the mounds was not uniform although all were along "in the vicinity of the margin of Loch Garry" (Lomax 1992:8). No Type B mounds were found along the swamp margins, i.e. areas of lower elevation, adjoining rushlands. Lomax suggests that sites may have been purposefully located relative to subtle variations in local elevation.

Nearly 300 artefacts were found in the eight sampled stone-artefact scatters. Densities ranged from 3 - 20 artefacts per 100 m² in disturbed areas to 33 - 100 artefacts per 100 m² in less disturbed areas. Raw materials were varied; chert and silcrete predominated, accounting for 71.7% of the sample, although quartz, basalt and quartzite were also present.

Formal stone tools were identified in the sample. These included geometric microliths (n=2), backed blade (n=1), thumbnail scraper (n=1). The most common tool was the scraper, 17 of these were identified.

In 1991, Rhoades (1992) performed a survey on Gumbower Island which is located along the Murray River, northwest of Echuca. The survey covered about 10% of the entire forest area. A total of 142 sites was recorded: 84 sites were scarred trees, 55 sites were mounds, two shell middens and one hearth were also found. No burials were found during the survey. Most of the scars were on box trees rather than River Red Gums. Rhoades suggests that this pattern may be a product of logging practices that targeted the large red gums. Most (80%; n=44) of the 55 mounds were within the Red Gum forest, located adjacent to the margins of water sources. The other mounds were in the Box woodland. The size of all the mounds was generally small, especially in comparison to those recorded in the Barmah-Millewa forests to the east.

Both shell middens were located on the margins of the Murray River. Charcoal from one of these middens was radiocarbon dated, producing an uncalibrated date of 510±70 B.P. (Beta-45946).

4.3.3 Site Inventory

A Sites Record Search was conducted at National Parks and Wildlife Service of New South Wales and at the Aboriginal Affairs of Victoria. Slightly more than 1500 sites have been recorded from Yorta Yorta Lands with most coming from south (i.e. Victoria) of the Murray (Table 6, Figure 2). The variation in site numbers between the two states is a product of two factors: 1. most of our lands are within Victoria and 2. most archaeological work has occurred south of the Murray.
A crucial point must be made about the distribution of sites on the map: virtually all of the blank portions of the map reflect areas that have not received archaeological surveys. Therefore, the relative densities of sites illustrated here is purely a reflection of the relative amounts of survey in this region and does not accurately reflect the original pattern of site distribution. The clusters of sites shown in the map correspond to areas having been surveyed. Thus, although the focus of survey to date has been along the major waterways, when surveys include areas away from the major rivers large numbers of sites are also found (e.g. Robinson & Mann 1996).

Table 6. Summary of Recorded Sites in the Yorta Yorta Lands

<table>
<thead>
<tr>
<th>Site Type</th>
<th>New South Wales</th>
<th>Victoria</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Count</td>
<td>Frequency</td>
<td>Count</td>
</tr>
<tr>
<td>Scarred Tree</td>
<td>118</td>
<td>38%</td>
<td>881</td>
</tr>
<tr>
<td>Mound</td>
<td>141</td>
<td>45%</td>
<td>212</td>
</tr>
<tr>
<td>Open Scatter</td>
<td>14</td>
<td>4%</td>
<td>79</td>
</tr>
<tr>
<td>Middens</td>
<td>19</td>
<td>6%</td>
<td>17</td>
</tr>
<tr>
<td>Burial</td>
<td>20</td>
<td>6%</td>
<td>24</td>
</tr>
</tbody>
</table>

|               | 999             | 66%      |
|               | 353             | 23%      |
|               | 93              | 6%       |
|               | 36              | 2%       |
|               | 44              | 3%       |
| Totals        | 312             | 99%      |
|               | 1213            | 99%      |
|               | 1525            | 100%     |

4.4 PLACES OF SIGNIFICANCE

4.4.1 Places Listed on the Register of the National Estate

Currently, nine areas within or adjacent to Yorta Yorta lands are listed on the Register of the National Estate as Natural Places (Table 7). A further eight places within or adjacent to Yorta Yorta lands are listed on the Register as containing Aboriginal sites (Table 8). Additional information on these latter places is given in Appendix 3.

Table 7. Current National Estate Database Entries for Natural Sites Within And Adjacent To Yorta Yorta Lands

<table>
<thead>
<tr>
<th>Place</th>
<th>Registered</th>
<th>Principal Group</th>
</tr>
</thead>
<tbody>
<tr>
<td>Barmah and Millewa Forests</td>
<td>30/06/92</td>
<td>Not Listed</td>
</tr>
<tr>
<td>Ulupna Island Forest Reserve</td>
<td>14/05/91</td>
<td>Vegetation communities</td>
</tr>
<tr>
<td>Warby Range Area</td>
<td>29/06/90</td>
<td>Temperate environments</td>
</tr>
<tr>
<td>Warby Range Eucalyptus Cadens Sites</td>
<td>14/05/91</td>
<td>Flora species sites and areas</td>
</tr>
<tr>
<td>Chiltern Park Including Iron Bark Forest</td>
<td>21/10/80</td>
<td>Vegetation communities</td>
</tr>
<tr>
<td>Mount Samaria State Park</td>
<td>21/10/80</td>
<td>Temperate environments</td>
</tr>
<tr>
<td>Dookie Bushland Reserve</td>
<td>Indicative</td>
<td>Vegetation Communities</td>
</tr>
<tr>
<td>Numurkah Rifle Range</td>
<td>Indicative</td>
<td>Vegetation Communities</td>
</tr>
</tbody>
</table>
Table 8. Current National Estate Database Entries For Aboriginal Sites Within And Adjacent To Yorta Yorta Lands

<table>
<thead>
<tr>
<th>Place</th>
<th>Registered</th>
<th>Principal Group</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kow Swamp</td>
<td>21/10/80</td>
<td>Aboriginal Burials</td>
</tr>
<tr>
<td>Gunbower Forest Scarred Trees</td>
<td>01/11/83</td>
<td>Aboriginal Modified Trees</td>
</tr>
<tr>
<td>Mt Pilot Art Sites 1 and 2</td>
<td>25/03/86</td>
<td>Aboriginal Art Sites</td>
</tr>
<tr>
<td>Mt Pilot Art Site, Beechworth Shelter</td>
<td>25/03/86</td>
<td>Aboriginal Art Site</td>
</tr>
<tr>
<td>Euroa, Garden Range Rock Shelter No. 2</td>
<td>21/10/80</td>
<td>Aboriginal Art Sites</td>
</tr>
<tr>
<td>Mount Camel Area</td>
<td>21/10/80</td>
<td>Aboriginal Quarries</td>
</tr>
<tr>
<td>Murchison Cemetery Aboriginal Graves</td>
<td>01/11/83</td>
<td>Aboriginal Burials</td>
</tr>
<tr>
<td>Faithfull Massacre Site Memorial</td>
<td>14/05/91</td>
<td>Historic Aboriginal Site</td>
</tr>
</tbody>
</table>

In addition to those areas already listed on the Register either as natural or cultural places, some additional sites have been proposed for each of these categories. These additional, significant sites are indicated in Table 9. Note that these sites are currently biased to Victoria only because of the extent of survey work there.

Table 9. Proposed Sites for Nomination to the Register of the National Estate (natural place proposals taken from Sherwin 1996, Robinson & Mann 1996, Robinson 1998; this study). The criteria are taken from those shown in Table 1.

<table>
<thead>
<tr>
<th>Place</th>
<th>Type</th>
<th>Criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>Loch Garry</td>
<td>natural and cultural</td>
<td>A2, A3, A4, B1, B2, C2, G1</td>
</tr>
<tr>
<td>James Bridge, lower Broken Creek</td>
<td>natural and cultural</td>
<td>A1, A2, A3, B1, D1, G1</td>
</tr>
<tr>
<td>Fairman’s Bridge, lower Broken Creek</td>
<td>natural and cultural</td>
<td>A1, A2, A3, B1, G1</td>
</tr>
<tr>
<td>Lower Broken Creek, Parish of Waaia</td>
<td>natural and cultural</td>
<td>A1, A2, A3, B1, G1</td>
</tr>
<tr>
<td>Galt’s Bridge, Broken Creek</td>
<td>natural and cultural</td>
<td>A2, A3, B1</td>
</tr>
<tr>
<td>Nine Mile Creek, Drumanure</td>
<td>natural and cultural</td>
<td>A1, A2, A3, A4, B1, B2, C1, D, G2</td>
</tr>
<tr>
<td>Broken and Boosey Creeks, Katamatite area</td>
<td>natural and cultural</td>
<td>A1, A3, B1, D1, G1</td>
</tr>
<tr>
<td>Boosey Creek, Katamatite-Tungamah</td>
<td>natural and cultural</td>
<td>A1, A2, A3, A4, B, C1, D1, G1</td>
</tr>
<tr>
<td>Tungamah Swamps</td>
<td>natural and cultural</td>
<td>A1, A2, A3, B1, C1, D1, G1</td>
</tr>
<tr>
<td>Rowan Swamp</td>
<td>natural and cultural</td>
<td>A1, A2, A3, B1, C1, D1, G1</td>
</tr>
<tr>
<td>Moodie Swamp</td>
<td>natural and cultural</td>
<td>A1, A2, A3, B1, D1, G1</td>
</tr>
<tr>
<td>Whroo-Costerfield State Forest</td>
<td>natural</td>
<td>A1, A2, A3, B1, C1, D1</td>
</tr>
<tr>
<td>Killawarra State Forest</td>
<td>natural and cultural</td>
<td>A2, A3, B1, C1, D1</td>
</tr>
<tr>
<td>Box woodlands south of Barmah Forest</td>
<td>natural and cultural</td>
<td>A2, B1</td>
</tr>
<tr>
<td>Doctor’s Swamp</td>
<td>natural and cultural</td>
<td>A2, A3, B1</td>
</tr>
<tr>
<td>Echuca Regional Park and State Forest</td>
<td>natural</td>
<td>A2, A3, D1</td>
</tr>
<tr>
<td>Lower Ovens River</td>
<td>natural and cultural</td>
<td>A2, A3, B1, C1, D1</td>
</tr>
</tbody>
</table>
Of these proposed places, Loch Garry is perhaps the most significant Aboriginal site identified to date as it:

1. offers one of the few examples of a relatively intact wetland system within the north-eastern region away from the Murray River;
2. clearly provided a focus for Aboriginal activities, with 34 sites identified to date from the 5% of the area surveyed. In addition, the surveyed sites have provided examples of reasonably dense stone artefact scatters in a region lacking in available stone; and
3. Shell material in some of the mounds can be dated, thus providing a temporal context to their origina and use.

**4.4.2 Ramsar Listed Places**

The Ramsar Convention on Wetlands of International Importance was the first intergovernmental treaty between nations directed towards conserving natural resources. It was organised under the auspices of UNESCO, one of 16 specialised agencies of the United Nations System. The signing of the Convention took place in 1971 in the small Iranian town of Ramsar. Australia was the first nation to become a Contracting Party to the Convention.

The aims of the convention are to halt the worldwide loss of wetlands and to conserve existing wetlands. Wetlands are selected as Ramsar sites for the List of Wetlands of International Importance on the basis of ecological, botanical, zoological, limnological or hydrological criteria.

Nine wetlands within Yorta Yorta lands are listed as Ramsar sites (Table 10), most of them in the central and western portions of the lands. Details of these wetlands and their values are given in Appendix 4.

**Table 10. Ramsar Listed Places in the Yorta Yorta Lands**

<table>
<thead>
<tr>
<th>Wetlands</th>
</tr>
</thead>
<tbody>
<tr>
<td>Barmah-Millewa Forest</td>
</tr>
<tr>
<td>Broken Creek</td>
</tr>
<tr>
<td>Gunbower Island</td>
</tr>
<tr>
<td>Gunbower Forest</td>
</tr>
<tr>
<td>Kanyapella Basin</td>
</tr>
<tr>
<td>Kow Swamp</td>
</tr>
<tr>
<td>Lower Broken River</td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>
4.4.3 Heritage Rivers

In Victoria, the Land Conservation Council undertook a Statewide assessment of the natural values of all rivers and creeks. From that study, eighteen Heritage Rivers were identified which were to be protected under the Heritage Rivers Act.

Three of these Heritage Rivers occur in the Yorta Yorta lands – the Murray, Goulburn and lower Ovens Rivers (LCC 1991)- and all of them are considered highly significant by us too.

4.4.4 Key regions

Although we agree with the listings of all of the above mentioned places for their natural and cultural heritage, four general regions hold special significance to Yorta Yorta people.

4.4.4.1 Barmah-Millewa Forests

The Barmah-Moira-Gulpa Island-Millewa State Forests occupy a 60,000 ha triangle of floodplain between Tocumwal, Barmah township and Deniliquin where the topographic variability is minimal; virtually all the land falls below 100 m in elevation. The flat and relatively featureless landscape of the Riverine Plain, through which the Lachlan, Murrumbidgee, Murray and Goulburn rivers, and their tributaries, flow, is an area where the rivers tend to be slow flowing with deep U-channels and where extensive wetlands (e.g., lagoons, lakes, marshes) have developed.

This extensive region comprising the Barmah State Forest, Millewa State Forest, Moira State Forest and Gulp Islands State Forest, is major wetland which is crucial to the general river system. This region exhibits a variety of microenvironments including riverine lagoon, sand hills and box ridges.

The Barmah-Millewa forests have been identified as one of nine outstanding wetlands in the Murray-Darling Basin (MDBC 1987:133) and have been classified as wetlands of international significance under the Ramsar Convention.

The Barmah-Millewa forests also exhibit an important cultural landscape. Although only a very small percentage of these forests has been archaeologically surveyed, more than 300 cultural sites have been recorded. The archaeology of this region is rich and varied. Although no great time scale can be attributed to the sites recorded in this area, these sites form an extremely important picture of how the wetlands were used over the last 2000 years.
These Red Gum forests provide areas containing important sources for artefact material (e.g. roots used as boomerangs, bark for canoes), food sources (e.g. mistletoe, fish) and medicinal plants.

Current uses of the forests by Yorta Yorta are varied. They remain an important source of bush foods (plants and animals) and medicinal plants. The Dharnya Centre, in the Barmah forest, provides an important interface with the general public. Various meeting places such as the Lakes area, Ulupna Island and Dharnya are used.

4.4.4.2 Kow Swamp

This former Ice Age margin is now represented by an extensive, open freshwater wetland which is the largest permanent wetland in the Victoria portion of the Riverine Plain.

This is an area containing cultural heritage of world significance. To date, Kow Swamp has yielded the largest single, localised skeletal population of late Ice Age (9,500-13,000 years ago). In addition, the cultural landscape around the swamp includes a range of archaeological sites.

A further significant value of Kow Swamp to the Yorta Yorta is that this area contains a reburial area for the skeletal remains which have been found at the swamp. The Yorta Yorta hold grave concerns regarding the environmental degradation due to present land use. These concerns include the current water levels, and its affects on general levels of salinity, archaeological sites. Other sources of impacts include adjacent business activities, especially the piggery, dairy and the Kraft Foods factory.

4.4.4.3 Warby Ranges

This is the largest range in the Yorta Yorta lands. It is also unique as a region of permanent springs.

The area has a high potential for archaeological sites though few have been recorded due to the lack of surveys in this region.

4.4.4.4 Gunbower Island / Perricoota State Forest

The island, bounded on by the Murray River and one of its anabranches, Gunbower Creek, covers nearly 20,00 ha (200 km2). This area is part of a more extensive forest and wetland system which is approximately the same size as the Barmah-Millewa forests when combined with the adjacent Koondrook and Barham forests.

This Ramsar listed region exhibits a variety of microenvironments. The island contains the second largest River Red Gum forest in Victoria.

Although the island has been severely logged, a wide range of archaeological sites has been
recorded from here. These include 142 sites recorded on Gunbower Island, one of which, a shell
midden, has been dated to about 500 years ago.

4.4.5 Additional Cultural sites of Special Significance to the Yorta Yorta

In addition to these four significant regions within the Yorta Yorta lands, many specific sites
have also been deemed significant by Yorta Yorta people. Table 11 lists such sites, or groups of
sites, as were identified through the Native Title hearings. These sites have been grouped by
geographic area. Statements of significance for them are being developed, with those sites for
which statements have been prepared documented in Table 12.

Table 11. Sites having Special Significance to Yorta Yorta

<table>
<thead>
<tr>
<th>Site Number</th>
<th>Place Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>AREA A: Murchison/Mooroopna/Shepparton/Goulburn River Region</td>
<td></td>
</tr>
<tr>
<td>A1</td>
<td>King Billy's Grave</td>
</tr>
<tr>
<td>A2</td>
<td>Police Paddock</td>
</tr>
<tr>
<td>A3</td>
<td>Cemetery Bend</td>
</tr>
<tr>
<td>A4</td>
<td>Waranga Basin</td>
</tr>
<tr>
<td>A5</td>
<td>Flats at Moorpoopna</td>
</tr>
<tr>
<td>A6</td>
<td>Dash's Paddock</td>
</tr>
<tr>
<td>A7</td>
<td>Don Howe's property</td>
</tr>
<tr>
<td>A8</td>
<td>Ochre quarry</td>
</tr>
<tr>
<td>A9</td>
<td>Mooroopna Cemetery Road</td>
</tr>
<tr>
<td>A10</td>
<td>Daunt's Bend</td>
</tr>
<tr>
<td>A11</td>
<td>Coombeena fruit picking camp</td>
</tr>
<tr>
<td>A12</td>
<td>Loch Garry State Forest</td>
</tr>
<tr>
<td>A13</td>
<td>Reedy Lake</td>
</tr>
<tr>
<td>A14</td>
<td>Broken River Basin</td>
</tr>
<tr>
<td>A15</td>
<td>Ngurai-Ilam-Wurrung Rock Well</td>
</tr>
<tr>
<td>A16</td>
<td>Stewart’s Bridge</td>
</tr>
<tr>
<td>A17</td>
<td>Whroo Rock Well</td>
</tr>
</tbody>
</table>

AREA B: Kow Swamp/Gunbower and Pericoota State Forest Region

<table>
<thead>
<tr>
<th>Site Number</th>
<th>Place Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>B1</td>
<td>Taylors Creek/Kow Swamp</td>
</tr>
<tr>
<td>B2</td>
<td>Black Charlie Lagoon</td>
</tr>
<tr>
<td>Site Number</td>
<td>Place Name</td>
</tr>
<tr>
<td>-------------</td>
<td>------------</td>
</tr>
<tr>
<td>B3</td>
<td>Torrumbarry Weir</td>
</tr>
<tr>
<td>B4</td>
<td>Gunbower State Forest</td>
</tr>
<tr>
<td>B5</td>
<td>Murray River</td>
</tr>
<tr>
<td>B6</td>
<td>Horseshoe Sandhill</td>
</tr>
<tr>
<td>B7</td>
<td>Corduroy Crossing</td>
</tr>
<tr>
<td>B8</td>
<td>Toorangabby Station</td>
</tr>
<tr>
<td>B9</td>
<td>Barham Forest</td>
</tr>
</tbody>
</table>

---

**AREA C: Echuca/Barmah & Moira State Forests/Mathoura Region**

<table>
<thead>
<tr>
<th>Site Number</th>
<th>Place Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>C1</td>
<td>Murray River</td>
</tr>
<tr>
<td>C2</td>
<td>First Creek</td>
</tr>
<tr>
<td>C3</td>
<td>Second Creek</td>
</tr>
<tr>
<td>C4</td>
<td>Algeboia Plain</td>
</tr>
<tr>
<td>C5</td>
<td>Boughyard</td>
</tr>
<tr>
<td>C6</td>
<td>Ochre pit (quarry)</td>
</tr>
<tr>
<td>C7</td>
<td>Emu Tree</td>
</tr>
<tr>
<td>C8</td>
<td>Bucks Sandhill</td>
</tr>
<tr>
<td>C9</td>
<td>Coolamon site</td>
</tr>
<tr>
<td>C10</td>
<td>Algeboia</td>
</tr>
<tr>
<td>C11</td>
<td>Walthour Swamp</td>
</tr>
<tr>
<td>C12</td>
<td>Black Gate Lagoon</td>
</tr>
<tr>
<td>C13</td>
<td>Cummeragunja-Maloga</td>
</tr>
</tbody>
</table>

---

**AREA D: Ulupna Island/Cobram/Mulwala/Yarrawonga Region**

<table>
<thead>
<tr>
<th>Site Number</th>
<th>Place Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>D1</td>
<td>Boat Rock Hill</td>
</tr>
<tr>
<td>D2</td>
<td>Horseshoe Lagoon</td>
</tr>
<tr>
<td>D3</td>
<td>Water hole near Racecourse Road</td>
</tr>
<tr>
<td>D4</td>
<td>Bruce's Bend (various)</td>
</tr>
<tr>
<td>D5</td>
<td>Mulwala Weir</td>
</tr>
<tr>
<td>D6</td>
<td>Mulwala State Forest (various)</td>
</tr>
<tr>
<td>D7</td>
<td>Cottadidda State Forest (various)</td>
</tr>
<tr>
<td>D8</td>
<td>Barooga (river flats and humpies)</td>
</tr>
<tr>
<td>D9</td>
<td>Forest &amp; Murray River Cobram - Ulupna</td>
</tr>
<tr>
<td>D10</td>
<td>Ulupna Island (various)</td>
</tr>
<tr>
<td>D11</td>
<td>Old Reserve - Wahgunya State Forest</td>
</tr>
</tbody>
</table>
AREA E: Wangaratta/Killawarra State Forest/Warby Ranges Region

Site Number | Place Name
---|---
E1 | Killawarra State Forest (various)
E2 | Camping area (Killawarra State Forest)
E3 | Burial Areas northeast of Wangaratta
E4 | Pangarang lookout in Warby Ranges
E5 | Ceremonial Ground
E6 | Scarred Trees at Dowdie Swamp
E7 | Rock wells

5. THREATS TO YORTA YORTA ENVIRONMENTAL AND CULTURAL HERITAGE

5.1 Overview of Issues

We have identified a variety of issues that pose threats to our lands and waters and to places of natural and cultural significance. (Table 13). These range from the impact of changes in traditional water regimes through water control measures to impacts associated with the destruction of our cultural sites.

Table 13 Summary of Primary Impacts Within Yorta Yorta Lands

<table>
<thead>
<tr>
<th>PRIMARY SOURCES</th>
<th>PRIMARY IMPACTS</th>
<th>Deterioration/ Erosion</th>
<th>Pollution*</th>
<th>Habitat Destruction</th>
<th>Vandalism+</th>
<th>Trash</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grazing</td>
<td></td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Water Regulation</td>
<td></td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mining</td>
<td></td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Logging</td>
<td></td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Agriculture</td>
<td></td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Road/Rail Reserves</td>
<td></td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Recreation</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>camping</td>
<td></td>
<td>X</td>
<td></td>
<td>X</td>
<td>X</td>
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* includes salinity; + includes artefact looting
Of these many threats, four are considered to be of particular concern because of their widespread impacts on our heritage. Each of these threats also has major impacts on the various sites listed on the Register of the National Estate and other sites identified as being significant. These major threats to Yorta Yorta heritage are:

- Changes to the aquatic environment
- Timber harvesting
- Grazing by domestic stock, and
- Destruction of cultural sites

They are discussed in more detail below.

**Changes in Water Regime**

As already emphasised in this document, Yorta Yorta people are predominantly water-based people whose lifestyle focuses on and around waterways. The provision of natural water flows is therefore fundamental to the continuation of our culture and traditional rights because of its fundamental role in replenishing our natural environment and ensuring the survival of our ancestral lands. In this context, we have never made a distinction between the terrestrial and aquatic environments within our lands but have always seen them as part of one, holistic system.

As has also been emphasised within this document, the Yorta Yorta lands include some very large wetland systems whose natural functions, survival and productivity depend entirely on regular flooding from the bigger rivers such as the Ovens, Goulburn, Murray and Edward.

Unfortunately, as has been well documented (e.g. Bren 1990; Cadwallader & Lawrence 1990; Close 1990; Jacobs 1990), the aquatic environments within the Yorta Yorta lands have been just as modified as the terrestrial environments. The major changes to the natural water regime have been as follows:

- Significant reductions in the frequency, extent and length of floods, resulting in far fewer wetlands being flooded than formerly
- Fundamental shifts in the timing of flooding from late winter and spring (as a consequence of winter rainfall and snow melt) to summer and autumn (as a consequence of controlled releases from dams for irrigation)
- The artificial creation of permanent wetlands from what were once intermittent wetlands, because of summer releases of excess water
- Changes in the temperature regime of regulated rivers, because of releases of cold water from storage dams
- Massive increases in nutrient and sediment runoff as a consequence of agriculture and vegetation clearance throughout the catchment
- The creation of barriers across most of the major waterways, so preventing the movement of instream wildlife
- The removal of thousands of logs from the streams to ‘facilitate’ stream flow in time of flood
- The introduction of exotic species of fish, and
• Major earthworks along some of the rivers and creeks for channelisation works.

In the Warby Range and Chesney Hills, just as severe a change in water regimes has occurred as a result of the selective grazing and degradation of land with springs, and the exploitation of groundwater aquifers for irrigation.

Some of the effects of these changes on the aquatic environment have already been noted (e.g. 4.1.4). In summary, though, all of these changes have caused massive environmental degradation of the waterways within Yorta Yorta lands as indicated by:

• Large declines in the abundance of native fish, leeches and snakes (see 4.1.4)
• The classification of three-quarters of the native fish species within Yorta Yorta lands as threatened wildlife (e.g. Robinson & Mann 1996)
• The lack of breeding by many species of waterbirds in Barmah Forest since 1970
• The failure of some species of fish to breed or to migrate to their breeding grounds
• The removal of breeding habitat for fish and other wildlife
• Changes to the natural drying and wetting regimes of nearly all wetlands
• Changes in vegetation (for instance, the replacement of Moira Grass Plains in Barmah Forest by Giant Rush and River Red Gum, Chesterfield 1986, and the transition from Grey Box to River Red Gum along some of the creeks, Robinson & Mann 1996)
• Declining tree health as a consequence of altered flooding regimes, and
• Increases in outbreaks of blue-green algae (Bren 1990; Robinson & Mann 1996).

5.3 Grazing by Domestic Stock

5.3.1 Cattle Grazing in the Red Gum Forests

When Europeans first arrived in the Yorta Yorta lands, both sheep and cattle grazed in Barmah Forest and the surrounding area. Since 1885, however, only cattle have been allowed to graze in Barmah Forest, under various types of agistement and lease.

Cattle grazing in Barmah State Forest is now carried out in accordance with grazing licenses issued under the Forest Act 1958 or water frontage licence issued under the Land Act 1958. Cattle grazing in Barmah State Park is carried out under a licence issued under the National Parks Act 1975. Four grazing licences and part of a water frontage licence cover areas now within the State Park. The Ulupna Island section of the park has been closed from grazing since 1980 because of its floristic values.

The main effects of this long history of grazing by sheep and cattle have been as follows:

• Detrimental effects on the species composition and structure of several plant communities in the forests and wetlands
• Declines or local extinctions of some species of shrubs (e.g. Sandalwood)
• Changes in vegetation: for instance, some areas that once supported palatable reeds and cumbungi have been taken over by giant rush. This has caused the disappearance of the
Brolga, a significant bird in Aboriginal culture, and the decline of some other bird life such as the Little Bittern and Spotless Crake. It also may have reduced the extent of potential nesting habitat for some species of waterbird (Chesterfield et al. 1984).

- Trampling of vegetation on the periphery of wetland areas which may deprive waterbirds of food and shelter. Some of the affected birds are protected under JAMBA, for instance Latham’s Snipe.
- Loss of understorey vegetation and consequent, an adverse effects on species which feed, nest, or shelter close to the forest floor.
- Weed invasion.
- Compaction and disturbance of the soil and litter layer, adversely affecting burrowing snakes and lizards that were once more common in these forests.
- Exacerbated impacts on the vegetation of the box ridges because of the restriction of cattle and horses to these areas of higher ground in times of flood (Wilson, K. 1989 Traditional Used Plants In The Barmah Forest Area:44).
- Soil disturbance, especially on wet or muddy ground, churning up wetland areas and damaging roads and tracks (see reports by Wilson and Bonhomme- 1989-90: pers comm Leon Atkinson Ranger, 2 Jan 1997).
- Desecration of cultural sites and traditional vegetation, particularly those areas on the higher ground, and
- Degradation of sites of natural or cultural significance.

While these are the main impacts of cattle on our heritage identified to date, there is still a lot more to be learnt about their effects. It is clear, nonetheless, that the removal of cattle would greatly benefit indigenous plants, animals, and sites, by reducing grazing pressure and physical disturbance. Furthermore the evidence clearly suggests that hoofed animals are incompatible with those conservation principles relating to the natural and cultural values of the forest (Barmah Management Plan, 1992:52-53).

5.3.2 Stock-grazing on other Crown land

Several studies within Yorta Yorta lands have clearly shown the impacts of grazing by domestic stock on the natural environment. In a study along the Broken Creeks system, grazing by stock was found to have significant impacts on:

- Groundcover Biomass Significant increase
- Tree Regeneration Significant increase
- Shrub cover Significant increase
- Lignum cover Significant increase
- Native grass type Significant increase in abundance of taller perennials
- % Bare ground Significant decrease
- Weed patches (e.g. annuals) Significant increase, and
- Noxious weeds Nearly significant decrease

(Robinson & Mann 1998).

Stock-grazing next to creeks is also implicated in the decline of native fish (Koehn 1993).
5.4. Timber Harvesting

Timber harvesting by Europeans has occurred throughout the Yorta Yorta lands since the 1840s. It is now concentrated on the large red gum forests along the Murray, Edward, Ovens and Goulburn Rivers but also includes the box-ironbark forests at Killawarra and Rushworth. Historically, timber-harvesting also happened in the Warby Range and in cypress-pine woodlands close to the Murray (LCC 1983).

By far the main effect of this persistent logging on our cultural and natural heritage has been the selective removal of most larger trees (see Bennett et al. 1998). This has resulted in:
- Loss of habitat for the 64% of mammal species in the region that require hollows (Bennett et al. 1998)
- Loss of habitat for the 37% of landbirds that nest in hollows
- Loss of breeding sites for the endangered Superb Parrot, a key species of the Yorta Yorta lands.
- Loss of habitat for animals and birds that need larger trees for food resources (Robinson & Traill 1996)
- Loss of habitat for wildlife dependent on fallen timber (e.g. Laven & McNally 1998) and
- Loss of cultural sites through the destruction of scarred trees.

In addition, recent studies have suggested that logging of the red gum forests has resulted in the removal of as much as 85% of the fallen timber debris which occurred on the floodplains before European contact (McNally & Parkinson 1999). One of the main components of structural complexity in red gum forests is thereby missing over extensive areas of our lands, again leading to major changes in the ecology and sustainability of the environment (McNally & Parkinson 1999).

5.5 Destruction of Cultural Sites

Factors affecting our cultural sites include:
- river erosion
- construction of tracks, levees and earth walls
- cattle
- logging
- recreation (camping, construction of fireplaces and picnic tables)
- bardi grub digging
- casual earth removal
- fires, and
- horses and rabbits

Linked to this issue of destruction of cultural sites has been the failure of government departments to ensure the protection of aboriginal sites. For example, on 22 November 1993, the Yorta Yorta Murray Goulburn River Clans Group Inc applied to the Minister for Aboriginal Affairs for a Declaration of Preservation for the place known as Buck's Sandhill in the Barmah Forest. Six years later, this Declaration has yet to be finalised, no reasons have been given for
the delay and very little, if any, communication has been provided to us by the Victorian Government. A similar situation exists with Kow Swamp.

6. RECOMMENDATIONS FOR PROTECTION OF OUR HERITAGE

6.1 GENERAL MANAGEMENT STRUCTURE PROPOSED FOR THE PROTECTION OF YORTA YORTA NATURAL AND CULTURAL HERITAGE

6.1.1 Native Title

The New South Wales and Victorian Governments, and private users of the lands must recognise that we are the native title holders of the claimed land and waters and respect our native title rights. These rights, detailed below, are available under the Native Title (Commonwealth) Act 1993 (N.T.A.). They can, and will be, exercised according to law, especially the N.T.A., should mediation prove unsuccessful and the matter be litigated in the Federal Court. Our native title rights comprise:

- The right to exclude others;
- The right to use natural resources;
- The right to participate fully in determinations concerning land and water management or development programs which impact upon the natural resources and natural environment.
- The right to prevent actions which may damage the lands, the natural resources or the natural environment.
- The right of access.
- The right to live on the lands.
- The right to maintain cultural and spiritual interests in the areas.
- The right to be buried in and to ensure the protection of burial grounds, ancient and modern located within the lands.
- The right to continue traditional fishing and food-gathering practices, and
- Right to use traditional management practices, eg fire.

6.1.2 Joint Management Plan & Board Of Management

A Joint Management Plan should be developed between the New South Wales Government, the Victorian Government and the Yorta Yorta. The Plan will establish a Board of Management in relation to the claimed land and waters. The Plan will reflect the acknowledgment by the New South Wales and Victorian Governments of our right to a key decision-making role in the management of the claimed lands and waters within the Yorta Yorta territorial boundary. Our participation in management in terms of day to day activities will be as an equal partner, not as subordinates providing advice when asked.

The Joint Management Plan will be part of a joint management arrangement in which we have management decision-making powers and a power of veto over all decision making in respect of the claimed land and waters. The Plan of Management will set out:
• The purposes for which the claimed land and waters are to be managed;
• The manner in which the management is carried out;
• Management guidelines for the claimed land and waters; and
• Our rights, including their native title rights and other rights under the N.T.A.; particularly the "future act" provisions of the N.T.A., with respect to the use and management of the claimed land and waters.

Through the Board of Management we will be involved in management at all levels, including policy formulation.

If agreement is reached on the terms of a Joint Management Plan it will be subject to inquiry and determination by the National Native Title Tribunal under the N.T.A.

6.1.3 Board of Management

The powers of the Board will concern, amongst other things, management and control of water rights and utilisation regimes; timber production; grazing; general use of the claimed lands; and cultural heritage matters.

The Board of Management will be structured such that we have a majority representation. The Board of Management will include representation from the Victorian and New South Wales Governments. The Board of Management will make general policy decisions and the Yorta Yorta people are to have a power to veto over decisions made by the Board in administering the Plan of Management.

Management decisions by the Board are to be implemented according to the Plan. For land and waters falling in New South Wales or Victoria the present Government departments involved will implement the Plan and Board decisions and will act on behalf of and subject to the decisions and direction of the Board and the Plan.

The Board of Management may receive advice as required from the advisory and decision-making structures, committees and other bodies that currently exist and operate in relation to our claimed areas.

6.2 POLICY IN REGARDS TO SPECIFIC ENVIRONMENTAL ISSUES

6.2.1 Water

Goals
• To provide adequate care, protection and maintenance of water.
• To maintain the land and waters in a natural and healthy state

Policy
We favour a water regime system that emulates natural wetting and drying regimes, including the reinstatement of regular and seasonally favourable flood events of sufficient extent and
duration by way of an environmental water allocation. We also wish to improve water quality within our lands.

Proposed Actions:
• Restore a water regime that emulates the natural wetting and drying fluctuations, through the use of environmental water allocations.
• Ensure that the Ramsar agreement is upheld for the nine Ramsar-listed wetlands, especially in terms of management of those sites.
• Nominate the Barmah-Billewa Forests for World Heritage listing.
• Reduce inputs of nutrients, sediments and herbicides into our waterways in order to improve water quality and the health of our waterways.
• Establish substantial buffer zones around all Ramsar-listed wetlands to give them adequate protection from degrading processes.
• Leave existing wetlands undisturbed from degrading processes, because of their importance in absorbing surface runoff from adjacent areas and in providing seasonal habitat for migratory waterfowl.
• maintain existing vegetative cover in the Yort Yorta lands to help ensure natural water cycling processes and the maintenance of long-term water quality.
• protect groundwater aquifers and recharge zones from potential sources of contamination.

6.2.2 Stock-grazing

Goals
• To maintain the land and waters in a natural and healthy state
• To help conserve places and sites identified as having heritage values to us and to the Register of the National Estate.

Policy
The Yorta Yorta favour a gradual phasing out of grazing within the claimed land with a complete removal of cattle in the longer term. In the interim, we aim to minimise the impacts of stock on water, soil, flora, fauna, archaeological and other aboriginal sites by limiting grazing to designated areas at designated times.

Proposed Actions
• Phase out stock-grazing from the claimed lands in the longer term.
• Stop winter grazing of our claimed lands.
• Remove stock-grazing from the riparian zone, around the Moira and Barmah Lakes, and from all areas listed as Ramsar wetlands, National Estate Registered places of natural value.
• Review the impacts of stock-grazing at other sites and amend management as required.

6.2.3 Timber-harvesting

Goals
• To maintain the claimed lands in a natural and healthy state
To preserve the remaining native forest habitats in order to conserve native wildlife species and help control erosion

Policy
The Yorta Yorta favour the gradual phasing-out of timber production in the claimed lands. In the interim, timber production should be limited to designated areas where it has minimal on environmental, recreational and cultural values.

Proposed Actions
- Phase out timber-harvesting and silvicultural operations in the claimed lands.
- Prepare a re-forestation plan for those areas that have been degraded by past activities for the purpose of controlling soil erosion, improving wildlife habitat diversity and improving water quality.

6.2.4 Recreational & Tourism Uses

Goals
- To enhance understanding of our natural and cultural heritage.
- To make the general public aware of their impacts on Yorta Yorta heritage and environment.
- To promote low-impact activities within our lands.

Policy
Ecotourism and cultural tourism on Yorta Yorta claimed lands will be on Board of Management terms and must only commence or continue with the Board's informed consent. The types of tourism encouraged by the Yorta Yorta within their lands will be consistent with the Board's policy under the Management Plan.

Proposed Actions:
- Prohibit power-boating, trail bikes, bardi grubbing, off-road horse riding and off-road four wheel drive vehicles because of their impacts on heritage areas.
- Control apiculture to minimise the effects of bees on native flora and fauna.
- Eradicate all feral animals within the claimed lands.
- Ensure the protection of all traditional foods and medicinal plants.
- Ensure the protection of all cultural sites.

6.2.5 Erosion Control

Goal
To reduce general patterns of erosion.

Proposed Actions
- Require the preparation of erosion-control plans for all earth-moving operations. This plan should be prepared for any area exhibiting active surface erosion and slope down-cutting and for any area that has lost significant forest vegetation cover, whether eroding or not.
• Prohibit power-boating, trail bikes, bardi grubbing, off-road horse riding and off-road four wheel drive vehicles because of their impacts on heritage areas
• Require all applications for permits to quarry sand in the claimed lands to be approved by the Yorta Yorta.

6.3 POLICY IN REGARDS TO CULTURAL HERITAGE ISSUES

6.3.1 General Policies

Goal
To protect and maintain the cultural rights as Yorta Yorta people. This includes (but is not limited to) archaeological sites, traditional places, language and continuing practices.

Policy
We believe that the day to day management and care of our Heritage should come under the control of a management committee that will be directed by a Council of Yorta Yorta elders. Under this structure, Yorta Yorta people will scrutinise all policy decisions relating to cultural heritage matters within our lands and waters.

Proposed Actions
• The establishment of mechanisms which will enable Yorta Yorta control and protection of, and access to Yorta Yorta cultural property, including a definition of Yorta Yorta cultural property.
• A system of appropriate Yorta Yorta representation in employment and training as administrators, rangers and cultural officer positions within the claimed areas.
• Transfer of the Dharnya Centre to the Yorta Clans Group to develop as a cultural centre of national and international significance.
• Board of management involvement in public education in relation to Yorta Yorta Cultural Heritage.
• Mechanisms by which we will have rights to access and control all historical and present information and materials, including intellectual property rights, pertaining to our people, land and water.
• The compiling of, and control of, access to a detailed register of all information and materials pertaining to our heritage.
• The return of all skeletal remains and artefacts wherever located to the Yorta Yorta.
• The establishment of mechanisms to enable us to control and protect our traditional food and medicinal plants.

6.3.2 Programmatic Agreement

It is recommended that a Programmatic Agreement be developed in consultation between the Yorta Yorta and the Cultural Heritage Managers of the Aboriginal Affairs Victoria and the National Parks and Wildlife Service of New South Wales. The Programmatic Agreement should include the following elements:
• Documentation of the consultation between the Yorta Yorta and the Cultural Heritage Managers;
• Implementation of the Yorta Yorta Cultural Resources Management Plan;
• Procedures for compliance with specific State and Federal legislation;
• Provision for monitoring and review of activities;
• Provision for revision of the Programmatic Agreement

6.3.3 Comprehensive Burial Treatment Plan

It is recommended that a burial treatment plan should be developed which provides guidance for the discovery, disinterment, and curation of human remains and associated artifacts. The elements of the treatment plan should include procedures to handle inadvertent discovery or exposure of human remains in the absence of a qualified archaeologist, as well as procedures to handle discovery of human remains during archaeological monitoring. The treatment plan should include:

1) Provision to divert or stop construction work, or stabilize exposed remains
2) Notification procedures
3) Provision for consultation
4) Identification and evaluation procedures
5) Criteria that will provide guidance on whether the remains should be disinterred or left in place
6) Location of temporary curation
7) Location of re-interment
8) Provision for appropriate ceremonies

6.3.4 Inadvertent Discovery of Aboriginal Human Remains and Objects

• If the human remains or objects were discovered during earth-moving activities, the activity shall be suspended and reasonable efforts to protect the remains or objects shall be made. The appropriate State Cultural Heritage Organisation shall be immediately notified of the discovery. The Heritage Officer will then notify the Yorta Yorta. All activity in the area of the discovery shall be suspended until appropriate mitigative procedures have been agreed upon and performed;
• Disposition and control of the remains or objects shall follow the requirements of appropriate legislation.

6.3.5 Intentional Excavation and Removal of Human Remains and Objects

• Consultation with the Yorta Yorta is required prior to excavation or removal;
• An excavation permit from the appropriate State cultural heritage agency is required;
• Right of control of the disposition of human remains or objects shall be negotiated between the Yorta Yorta and the appropriate State agency;
• Proof of all consultation shall be provided by the applicant.
6.3.6 Discovery of Buried Cultural Deposits

It is recommended that if cultural resources are encountered inadvertently during an undertaking, work in the immediate vicinity shall be halted, the immediate vicinity of the site shall be secured, and the Yorta Yorta and appropriate State Cultural Heritage organisation should be notified. The following procedure should be followed:

- An *in situ* evaluation of the resources shall be made by a qualified archaeologist and a representative of the Yorta Yorta. Based on recommendations from these two people, decisions regarding treatment of the resources shall be made in consultation with the appropriate State Cultural Heritage Manager.

7. PRIORITIES FOR FUTURE WORK

7.1 MONITORING AND RESEARCH

Monitoring of the environmental and heritage areas should be an integral part of the implementation of this management plan. Monitoring should occur not only for specific projects but general monitoring should also be implemented.

Research into the environment and heritage within the Yorta Yorta lands should be a continuing part of the management plan in order to provide data which will support the implementation and further development of the plan.

The Australian Heritage Commission is actively involved in compiling or advising on a number of inventories. Priorities for implementation and completion of these projects and programs are suggested, but these priorities are subject to revision based on our needs, the availability of funding, and conditions affecting the resources. The priorities are seen as follows:

**Inventory**
- Complete inventory surveys of the unsurveyed portions of Yorta Yorta lands, particularly the areas listed in Table 14;
- Identify, map, and describe all resources encountered
- Evaluate historic and prehistoric sites and places for significance
- Make photo documentation of all resources encountered
- Complete inventory surveys and documentation of Aboriginal Places

**Table 14. Proposed Areas For Archaeological Work**

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<td>Warby Range</td>
<td>Inventory Survey</td>
</tr>
<tr>
<td>Green Gully</td>
<td>Inventory Survey</td>
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Assessment:
- Identify historic and prehistoric resources that are subject to destruction or deterioration from natural causes
- Identify historic and prehistoric resources that are subject to destruction or deterioration from human activities or neglect
- Identify the specific causes of destruction or deterioration
- Assess methods of stopping the destruction or deterioration
- Identify a suitable curation facility for artifacts, human remains, and documents

Treatment:
- Develop a program to stabilize resources that are subject to destruction or deterioration from either natural causes, human activities, or neglect;
- Develop a program to rehabilitate resources;
- Develop a program to monitor the condition of fragile resources

Management and Interpretation:
- Maintain the condition of the sites through an active program of monitoring, repair, and stabilisation;
- Continue and expand the interpretative and public education program. Continue the program to collect oral histories from individuals that would have information about the Yorta Yorta lands;
- Develop and maintain a new sensitivity map that distinguishes between areas of known or potential sensitivity and areas known to be clear of cultural resources.

7.2 INTERPRETATION

A central part of long-term management of our lands must be one of public education. A major process in this approach is one of interpretation and explanation for both natural and cultural features and areas.

We believe that interpretation of Aboriginal places is a process of cross-cultural communication. This process has begun in Yorta Yorta lands with the creation of the Dharnya Interpretive Centre.
in the Barmah Forest. Currently the centre is controlled by the Victorian Department of Natural Resources and Environment. We recommend that the Dharnya Centre be transferred to the Yorta Yorta Clans Group and that this centre be developed as a cultural centre of national and international significance.

In addition to the Dharnya Centre, an interpretive plan should be considered for areas across the Yorta Yorta lands. The interpretive plan should serve a variety of audiences. These would include local residents, adults and children, visitors from other parts of Australia as well as overseas tourists.

The plan should establish and define the modes of interpretation. These would include, but not be restricted to directional signs, roadside interpretive signs, interpretive trails and brochures. Each of these elements should be integrated into a cohesive plan which follows consistent themes. The overall strategy would be to provide accurate information about the natural and cultural landscape within the Yorta Yorta lands and offer a variety of interpretive experiences ranging from the Dharnya Centre to specific sites.

7.3 IMPLEMENTATION OF PLAN

A three-year implementation program will be prepared by us to ensure efficient implementation of this management plan. It must be emphasised again that the plan is just an initial presentation of our concerns and goals regarding the conservation of our natural and cultural heritage. The plan therefore will be updated and further developed as we learn more about our claimed lands.

REFERENCES


Atkinson, W., Berryman, A. Aboriginal Associations with the Murray Valley: Report to the Land Conservation Council in 1983.


Beveridge, P. Of the Aborigines Inhabiting, the Great Lacustrine and Riverine Depression of the Lower Murray, Lower Murrumbidgee, Lower Lachlan and Lower Darling: Royal Society of South Wales, 6th June 1883.


Victoria Archaeological Survey, Albert Park, Victoria.


Cannon, M. Black Land White Land Minerva Australia 1993.


Curr, E.M. 1883 Recollections of squatting in Victoria: then called the Port Phillip District from 1841-1851. George Robertson, Melbourne.


Lance, Allan and Stephen G. Webb 1985 An Archaeological Investigation of a Sand Dune on the Murray River at Moama, N.S.W. ANU Archaeological Consultancies, Canberra, A.C.T.


MDBC (1987). Murray-Darling Basin Environmental Resources Study. MDBC, Canberra
Mitchell, T.L. 1839 *Three Expeditions into the Interior of Eastern Australia Vol I & II.*
Morey, E. 1907/1908 Reminiscences of a Pioneer in New South Wales. Sydney Mail 1907
Penney, J. 1979 *The Death of Queen Aggie.* B.A. (Hons.) Thesis, Department of Geography, La Trobe University.
Reynolds, H. *The Other Side of the Frontier,* James Cook University, Townsville 1981.
Rudd, A. (undated). *Katamatite. The First 100 Years.* Privately published.
Sturt, C. 1883 *Two Expeditions into the Interior of Southern Australia During the Years 1829-1830.* London.

**APPENDIX 1. TRADITIONAL VEGETATION USAGE BY YORTA YORTA**

**Bark:**
Canoes, shields, mia mias and coolamons were all made from bark removed from living trees. The size and shape of the scar made by removing the bark indicates the use the bark slab was put to (see Figure 3.1).
The red gum and the three types of box were all utilised for their bark. There are a few box ridges that were extensively harvested for their bark, in particular Tongalong ridge (31), Ulupna Island ridge (46) and the two ridges north of Hammys plain (15, 26). All are in close proximity to the Murray river. No areas of red gum were found in the Barmah forest with an equivalent intensity of scarred trees as that of the mentioned box ridges.

Canoes:
Canoes are a feature of the Barmah forest as with other forests along the Murray River flood plain. The three types of trees used to make canoes in the Barmah forest were red gum, yellow box, and grey box. Black box bark was also used to make canoes in the Barmah area, but no black box canoe trees are found in the Barmah forest itself. A contributing factor to this may be that there are very few black box trees included in the present day Barmah forest.

The original size of the canoe can be measured from the scar, if the re-growth is determined. As a general rule each metre of canoe carries one person i.e. a three metre canoe carries around three people. The canoe scars in the Barmah forest vary from about 1.5 metres (a child's canoe) to a scar in excess of 8 metres on Barmah island. Often these scars are slightly pointed at one end and are rounded at the other. The pointy end becomes the bow and the rounded one becomes the stern (Gary Nelson pers. comm.).

Canoes were only made by men (Wally Cooper pers. comm., Gary Nelson pers. comm., Matthews 1893). They chose potential canoe trees carefully; free of knots and preferably with a slight bend in the trunk where the slab of bark was to be removed. By choosing a tree with a bend in it, the canoe bow and stern had natural clearance from the water and required little shaping when being cured.

The trees often had toe holes cut into the bark or branches propped up against the trunk to help the Aboriginal balance while chopping out the canoe with his stone axe. Removing the bark of the red gum and box trees can be difficult, besides tapping the canoe gently all over the surface to aid its removal, Aborigines also timed the removal of the bark. The bark is said to be easier to pry off "when the sap is running" or around late spring-early summer time (Sandy Atkinson pers. comm., Gary Nelson and Wayne Atkinson pers. comm.). The time of the day is also very important, R early in the morning when the bark is cold is easiest, as the day warms up so does the sap which becomes tacky and the bark becomes harder to remove " (Wally Cooper and Les Cooper pers. comm.).

After the canoe had been hammered over its surface, it was pried off the tree and lowered to the ground by means of twine. The bark slab is still easily broken at this stage and a leaf litter fire was used to dry out the sap, toughen and cure the canoe.

Canoes were used to transport both people and food from hunting and, gathering, grounds. They required skilful handling due to their frail and unstable nature and were posed through the wetlands to gather foods such as cormorant eggs, ducks and fish. Curr recorded that he was given fresh couch grass to sit on in the canoe (Curr 1883).
Fires were lit on hearths of wet clay in the bows for grilling a fresh duck or fish and 1 or keeping warm (Wayne Atkinson and Gary Nelson pers. comm., Curr 1965).

Mia mias:
The mia mias or shelters were made from either bark or leafy boughs or a combination of both depending on the season. In cooler weather the mia mias were made of bark and as the weather began to improve mia mias of leafy boughs were built.

Mia mias were constructed in a sort of big, half round lean to and could be made fairly quickly. Daniel Matthews was camping away from Maloga and the aborigines who accompanied him built a bough gunyah* for the evenings shelter (Matthews 1879, 1882).

The bark for mia mias was removed from the trees in rectangular slabs, the upper and lower edges of the scar being marked by parallel stone axe marks.

The mark of the white mans steel axe is unmistakable on a number of the shelter scars particularly around Ulupna Island. Shelter scars are marked with parallel cuts using either steel or stone axe, or 'scissor' steel axe marks. It is possible that, either White man copied the technique of making the shelters out of bark from the Aborigines or that the steel axes were bought 1 traded by the Aborigines.

gunyah - Matthews frequently used this word as an alternative term to mia mia in his reports of the Maloga Aboriginal Mission School.

Shields:
The shape of shield scars in the Barmah forest are variable, of the more common shapes are drawn by Nelson (see Figure 3.1). The majority of shield scars in the Barmah forest are found on box trees and are approximately one metre in length.

Coolamons:
Oval shaped dishes or coolamons up to 0.5 metre, were cut from both red gum and box and used for carrying food or water (Des, Morgan Snr. pers.. comm., Sandy Atkinson -pers. comm , Gary Nelson pers. comm., Curr 1965).

Use of Fibre:

Nets
Many types of nets were made by the people of the Barmah forest. Duck nets were strung low across the mouths of lagoons, and were frightened by the hunters into the nets (Des Morgan Snr., pers. comm., Gary Nelson pers. comm., Atkinson and Berryman 1983, Beveridge 1889). Other objects made out of net included women's net bags, nets worn on the forehead and fishing nets (Curr 1886).

Fishing nets were also used for skipping ropes.
"They made a rope by lightly rolling up a fishing net. Then vie with each other by jumping in and assuming the most grotesque appearances, lying on the ground rolling on the ground rolling over, and imitating the movement of various animals to the amusement of the spectators. This game is only practiced by the men (Matthews 1878).

Twine
Grass twine or cord was used to tie bodies into a sitting position for burial (Cato 1976).

Tools & Weapons & Implements:

Spears
Different types of spears were made by the people of this area for different purposes; Emu spears, war spears and fishing spears (Curr 1886).

The reed spears were used by the Aborigines to fish with. They were a major trade item for Mt. William greenstone. Reed spears or cama's were made by straightening and curing the reed stems over the coals (Curr 1965, Matthews 1896, Smyth 1878).

Wich-wich
The wich-wich was thrown to improve aim over long distances (Des Morgan Snr.). It consisted of a long lignum shaft, hafted to an oval wooden missile (Edwards 1936).

Yam sticks
Yam sticks were carried by the women on their daily food collecting trips and also used for tasks such as preparing the earthen oven (Curr 1965).

Undema
Tree grubs were a favourite food of the people of the Barmah forest and they were extracted from the trees using a hooked twig or undema (Curr 1886).

Yiletta
Yiiettas were notched message sticks carried by 'postmen' between tribes.

Hunting Aids:

Fish traps
Fish traps were made at the mouths of natural flood channels by driving stakes close together. The stakes prevented the fish escaping with the receding flood waters (Atkinson and Berryman 1983). These traps were owned by individual family groups and descended to their heirs (Curr 1965).

Plant debris as cover
Besides netting the ducks, the people of the Barmah forest would swim beneath the water using a reed to breathe through and floating clumps of plant debris as cover. When they reached the ducks, they would pull them below the surface by their legs (Gary Nelson, pers. Comm.).
Adhesives
The resin or gum of Waw-luila was used to fasten the greenstone to the shaft of the tomahawks (Sandy Atkinson pers. comm., Gott 1985). The gum of silver wattle was also used for fastening tomahawks (Gott 1985).

Resin was also used to repair the canoes (Gary Nelson pers. Comm.).

Fire
Aboriginal people of the Barmah forest used fire to manage the plants of the forest and also used it to cook the food plants. Fire was made by rubbing up and down one vertical stick in a crack (Clark 1988). Rather than having to make a fire when they shifted to a new camp the women carried fire sticks (Curr 1965).

Managing the forest with fire:

The Aborigines maintained the forest with fire. Fire sensitivity of River Red gum seedlings ensured the plains that were described by Curr at the Barmah lakes were kept as grasslands. Both the plains and reeds were burnt (Curr 1965).

Cooking

There is no stone naturally occurring in the Barmah forest, nor any containers in which to cook. One method of cooking food was steaming in an earthen oven.

'The way in which these ovens were used was as follows:-

When there was food to be baked the women, with their hands and yam sticks scooped a hole in the mound, if in doing so they came upon any lumps of clay (for there was no stone in these parts), they roughly lined the bottom of the hole with them, if none were met with they quickly doing up a quantity for the purpose with their yam-sticks from somewhere near at hand. These lumps were about twice the size of a mans fist The bottom of the hole then being lined with them, a fire was made on top of them and on the fire were thrown more of these lumps of clay. When the fire had burnt down these lumps were removed to one side and the hot embers to the other. The hole being thus cleared of everything except its flooring of hot lumps of clay, there after were strewn thinly with grass or with the leaves of a herb called pennyroyal, green if possible, if well damped with water. On this were laid neatly packed, the animals or roots to be cooked then came another coating of wet grass next the remaining lumps of heated clay, the heated burning embers. These were often covered with a sheet of bark and on top of all this was a quantity of earth. In an hour or two the food was taken out all cooked and clean." (Curr 1965)

Over many years-the plant and animal debris from these cooking sites built up, these sites are commonly known as mounds.

Food Plants
Food plants were gathered by the women and children.
Roots and Shoots
Roots are stored in the ground for long periods of time and available all year round, they provided a staple food source. Quantities of roots and shoots would have been dug and taken back to camp to be cooked.

Greens and Fruits
Probably these were eaten as they were encountered, rather than gathered and taken back to camp.

Seeds and Nuts
The seed of Waw-luila was eaten as encountered (Wally Cooper pers. comm.), other seed may have been gathered and taken back to camp for processing.

Drinks
The people of this area basically drank water, though sometimes it was sweetened by dissolving manna or from soaking gum blossom in it (Curr 1965, Clark 1988). The water was held in a kokoma, made from hollowed out tree knots or lumps.

Medicine
There are 13 known medicine plants recorded for the Barmah forest (see table xx). The strong belief in the powers of Old Man Weed remains in the community today. It is used for curing both internal and external ailments.

Poison
Fish poisoning was occasionally practiced using the fresh gum tree boughs placed into small lagoons. After a few hours had past the fish died and came to the surface (Curr 1965). Two other traditionally used fish poison plants that grow in the Barmah forest are the Willow Wattle (using the bark) and the Waterpepper (using the leaves) (Gott 1985).

Ornamentation
Necklaces of short lengths of Common reed threaded on twine were used in this area (Curr 1883, Beveridge 1889).

**Plant species known to be used by the Yorta Yorta people**

**Bartja** *(Cherry Ballart)*
USE: Fruit for food, sap used for medicine (Gott 1985)
HABITAT & NOTES: Found in both Red gum and Box communities. Only a few trees left in the Barmah forest. Use to be fairly common around Cherry tree yards as the name suggests (Des Morgan Snr.), possibly removed through fear of stock poisoning.

**Berrigan**
USE: Leaves crushed and boiled, used for skin medicine (Isaacs 1987).
HABITAT & NOTES: Found growing in both grey and black box communities of the Barmah forest.
Black Box
USE: Bark used to make coolamons, mia mias, canoes, shelters (Gary Nelson, pers. comm.)

Box mistletoe
USE: Fruit used as food (Elizabeth Hoffman, pers. comm.).

Buckabun
USE: Stems and leaves eaten as fresh greens, "best eaten before flowering"- (Elizabeth Hoffman, Des' Morgan Snr., Wayne Atkinson, Gary Nelson, Colin Walker, Lula Grant, Ella Anselmi, Wally Cooper, pers. comms).

Common Reed
USE: Stems used to make the reed spears. These spears were traded for Mt William greenstone. "Best time to harvest the stems for spears is when the water recedes" - Wally Cooper, pers. comm. (Des Morgan Snr., Gary Nelson, Wayne Atkinson, Wally Cooper, Smyth 1878, Curr 1883, Gott 1985).
USE: Shoots for food (Barmah forest), Wally Cooper, pers. comm. Pieces of stem used to make ornamental necklace. ((Gott 1985, Curr 1965).

Cumbungi or bulrush
USE: Underground stem or rhizome used for food. Roots are pounded for the starch. “I remember the aboriginal women pounding the stems of the cumbungi” (Mrs Corry, Tongala, pers. comm; Beveridge 1878; Gott 1985). Young shoots used as food (Wally Cooper, pers. comm.). Underground stem fibres used for making nets and string (Beveridge 1889).

Native Pennyroyal and River mint
USE: Used as a herb when steaming meat in the ovens (Curr 1965).

Old man weed
USE: Whole plant used for medicinal purposes. Makes the best medicine when it has flower buds. Used as a skin lotion for sores and cuts. Also drunk for upset stomachs and as a health tonic. This plant is still sought today for medicine. A skin lotion made from this plant is now available commercially (Yorta Yorta community, pers. comm.).

River Red gum or Dharnya
USE: Fresh leaves burnt to smoke out the spirit of the dead (Elizabeth Hoffman, pers. comm.)
USE: Bark used to make coolamons, mia mias, and canoes (Gary Nelson, Des Morgan Snr., Colin Walker, Wayne Atkinson, pers. comms).
USE: Knots and lumps on the trees hollowed out to make ko-koma's (wooden water containers) (Curr 1886).
USE: Fresh boughs thrown into lagoons as a fish poison (Curr 1965).

Ruby Saltbush
USE: Fruit as food (Ella Anselmi, pers. comm.).
HABITAT & NOTES: Not found in the Barmah forest but found growing in remnant road-side vegetation along Barmah-Picola road.
Silver Wattle
USE: Gum soaked in water and used as a medicine for upset stomachs (Elizabeth Hoffman, pers. comm.).

Sweet Quandong or Malinyodo
USE: Fruit for food in Barmah Forest (Wally Cooper, pers. comm.).
HABITAT & NOTES:
Now extinct from the Barmah forest. Seedlings known to be palatable to sheep (Doug Frood pers., comm.).

Tangled Lignum
USE: long stems used to make the shaft of the wich-wich (Edwards 1936).

Variable Sida
USE: Fruit as food (Ella Anselmi, pers. comm.).

Water-ribbons
USE: Raw tubers used for food, "tubers sweetest when the plant is fruiting" (Wally Cooper, pers. comm.).

APPENDIX 3. DETAILS OF PLACES LISTED ON THE REGISTER OF THE NATIONAL ESTATE AS CONTAINING ABORIGINAL SITES

Kow Swamp

Burials in sand around the lake shore. Investigations at this site have unearthed approximately 60 skeletons dating between 6,000 and 13,000 years before present. The skeletal population is characterised by a number of archaic morphological traits which have given rise to speculation that it is a relict of an earlier population.

AHC Official Statement of Significance: The Kow Swamp burials have aroused worldwide interest because they are the largest single localised population group of late Pleistocene antiquity yet found anywhere in the world. Some forty burials have been excavated, and date from 9,500 to 13,500 years ago. The whole group shows remarkably archaic features. One of the major, palaeontological discoveries of the past thirty years.

Gunbower Forest Scarred Trees

The Place Report describes that a dozen or more scarred tree have been located and photographed in this particular area of the Gunbower Island reserved forest. Subsequent archeological survey with the forests have shown that this region contains a high density and wide variety of archaeological sites.
AHC Official Statement of Significance: The scarred trees in this region are well preserved surviving material remains indicative of past economic activities. These sites show adaptation to and utilisation of the immediate riverine environment(s) and support local traditional information. Their proximity to Kow Swamp make them important and significant components of the historic sequence.

**Mt. Pilot Art Site Area**

The shelters are formed in fallen granite boulders on the slopes of Mt. Pilot. The region has a variety of environments which were probably exploited by the Aborigines, but to date little survey work to locate occupation sites has been performed. Both shelters contain red art work and deposits of potential significance.

AHC Official Statement of Significance: Art sites are rare in Victoria and the Mount Pilot sites are isolated from other north-east Victorian art sites. The size and style of motif is unlike that of any other Victorian painting site. Both sites are well preserved and contain potential deposit.

**Mount Pilot Art Site, Beechworth Shelter**

The pictographs are in a granite boulder overhang. Red ochre figures are visible on the south wall; these include a possible snake, a possible kangaroo and two other indistinguishable figures, one oriented along a vertical plane, the other along a horizontal plane.

AHC Official Statement of Significance: none is provided on the Place Report form although the same statement listed above for Mt. Pilot Art Sites is applicable here.

**Garden Range Rock Shelter No. 2 (Euroa)**

An art site located within a granite overhang. The figures were painted on an almost vertical, two-tier, slab of rock. They have been executed in various shades of red and orange ochre; their colour and stage of fading suggests two phases of painting occurred. Two major motifs are represented - stick figures and parallel strokes.

AHC Official Statement of Significance: Such paintings are rare in Victoria. These motifs bear a similarity to those occurring in the Grampians, the only other portion of the state where paintings are known to occur.

**Mount Camel Area**

Two stone quarry sites adjacent to Mt. Camel; one is on the southeast slopes (Mt. Camel north), the other is about 1.5 km further south (Mt. Camel south). Mt Camel north comprises about thirty quarrying pits and troughs on a low knoll. Mt Camel south has pits on a hilltop and quarry waste below greenstone boulders on a hill slope. Flaking floors also occur.

AHC Official Statement of Significance: The Mount Camel area includes extensive prehistoric quarries from which Aborigines obtained greenstone for manufacturing ground-edge axes.
Scientific analysis has established that axes from this quarry were traded throughout Victoria, in excess of 100 km from the source. This evidence establishes the considerable economic significance this source of stone had in the past.

**Faithfull Massacre Site Memorial**

The site comprises a granite boulder and plaque memorial to the site of the Faithfull massacre. The massacre occurred on 11 April 1838 when a party of Europeans (stockmen, shepards as well as convicts and ex-convicts in the service of William and George Faithfull) were attacked by a group of Aboriginal men, believed to be Waveroo and Taungerong. This event occurred near what is now Benalla.

Eight Europeans and one Aboriginal were killed during the attack. Although the incident bore the hallmarks of a specific, traditionally sanctioned act of revenge, the guerilla tactics employed by the Aboriginal group led the government and its military advisers to perceive the Aboriginal people as conducting a formal campaign of resistance to pastoral settlement. This interpretation led to the establishment of the border police, a paramilitary force which was, in effect, a force of occupation.

AHC Official Statement of Significance: The Faithfull massacre is important for two reasons. Firstly, it symbolises the type of conflict and misunderstanding which arose between Aboriginal people and European settlers as the pastoral frontier moved across Australia. Secondly, it resulted in a series of retaliatory raids by both groups, which led to the establishment of the border police (Criterion A.4).

**Murchison Cemetery Aboriginal Graves**

The graves of King Tattambo and Captain John are sited in the Murchison cemetery. The grave of King Tattambo is protected by a wrought iron fence; the grave of Captain John is open.

AHC Official Statement of Significance: An historic Aboriginal grave site is rare, especially one with an associated king plate.

**Barmah-Millewa Forests**

Although nominated as a natural place, archaeological survey in the Barmah-Millewa forests have shown that this region is contains hundreds, perhaps thousands of archaeological sites.

AHC Official Statement of Significance (pertaining to Aboriginal sites): mention is given in passing to the "diversity of Aboriginal site types present in the area" which "gives the place importance in exhibiting an unusual richness of cultural features. Although accurate in this general description, this statement should be expanded to provide a greater appreciation of the scientific significance to the sites in this region. Here is a recommended addition:

The organisation of the cultural landscape within the Barmah-Millewa forests, as exemplified by the spatial arrangements of sites, particularly the large mounds and cemeteries, strongly suggests...
that well-defined territories were present. These sites, together as a whole, have the potential to provide information regarding numerous aspects of past Aboriginal lifeways.

**Ulupna Island Flora Reserve**

This place consists of Crown Land included as part of the Barmah State Park (Gazetted 17/12/87) and is specifically included as part of the Barmah and Millewa Forests nomination. No mention of the Aboriginal sites is provided in this statement. Subsequent to the listing of Ulupna Island, two archaeological surveys have been conducted on portions of the island (Russell 1992, Schell 1995).

A small portion of Ulupna Island was surveyed in 1992. Russell (1992) performed an intensive survey along two lagoons (Dead River, Dead End) located in the northwest corners of the island. Dead River is a former channel of the Murray; Dead End lagoon is a section of an older portion of the river channel. Nine sites were found and recorded. These include seven scarred trees and two isolated hearths. The hearths, both found along Dead End Lagoon, consisted of clusters of clay balls and shell fragments; no stone artefacts were found.

Schell (1995) surveyed an area of roughly 2.5 km² in the western portion of Ulupna Island, focusing on the margins of rivers and creeks. Fifty-five (55) sites were recorded, almost all (49) were scarred trees although one lithic scatter and five isolated lithic artefacts were also recorded. No mounds, hearths or shell middens were located.

About half of the sites were located along two lagoons (Dead River Lagoon, Dead End Lagoon) and a creek; only one site was found adjacent to the Murray River. The other sites, all consisting of stone artefacts, were found on the dirt tracks. The majority (42) of the scarred trees were River Red Gum; the remaining seven were on Grey Box.

It is unclear whether any of the sites recorded by Schell had previously been recorded by Russell. Nevertheless, these two, relatively small

AHC Official Statement of Significance: No statement regarding archaeological sites is provided in the Ulupna Island Flora Reserve Place Report.

The following is recommended as an addendum to the Place Report:

A variety of Aboriginal sites have been recorded from the island and the potential for an even greater density of sites is high. Taken together, these sites have the potential to provide information regarding the organisation of a cultural landscape in a unique setting.

**APPENDIX 2. RAMSAR SITES IN THE YORTA YORTA LANDS**

1. Barmah-Millewa Forest - RIV001V1

Area: 29 500 ha.

Elevation: c. 94 m ASL.

Other listed wetlands in same aggregation: RIV005VI (Broken Creek), RIV011VI (Gunbower Island), RIV016VI (Kow Swamp).

Wetland type(s): B1, B2, B4.

Criteria for inclusion: 1, 2, 3, 5.

Site description: The area is a large River Red Gum Eucalyptus camaldulensis open forest and woodland. The forest features a variety of permanent and temporary wetlands, including lakes, swamps, billabongs, grassland plains and flooded forest. Smaller areas support Black Box E. largiflorens, Yellow Box E. melliodora and Grey Box E. microcarpa woodland on higher ground.

Physical features: Geological setting: Quaternary fluvial and aeolian sediments. Climate: Mean and median annual rainfall at Ulupna are 448 and 437 mm respectively (BM 1995a). Mean and median annual rainfall at Barmah East are 388 and 368 mm respectively (BM 1995a).

Hydrological features: One major stream, Tullah Creek, flows almost the length of the Victorian side of the forest but is not an anabranch of the Murray River (unlike most major creeks in forests along this river). Mean annual discharge in the Murray River at Tocumwal is 5 860 000 megalitres; mean pH and mean conductivity are 7.4 and 66 EC respectively (RWC 1990d). Mean annual discharge in the Murray River at Barmah is 3 620 000 megalitres; mean pH and mean conductivity are 7.1 and 72 EC respectively (RWC 1990d).

Ecological features: The Barmah-Millewa Forest consists of a large area of floodplain forest with a variety of wetland and dryland habitats for flora and fauna. It is very valuable for breeding waterbirds and the threatened Superb Parrot Polytelis swainsonii.

Significance: Barmah Forest is a high value wetland for its ecological, recreational, tourist, scientific, educational, cultural, scenic and aesthetic features. It is of special value for its genetic and ecological diversity because of its size, variety of communities and its high productivity (given maintenance of flooding). Barmah Forest has the most extensive areas of Moira grasslands in Victoria (CFL 1990a; Ward 1991, 1995a). Given an appropriate flooding regime Barmah Forest has supported significant colonies of Ibis and nesting waterfowl, and provides significant breeding habitat for fish and amphibians. The Barmah-Millewa forest is the largest River Red Gum forest in Australia (CFL 1990a). River Red Gum and Black Box forests have a high priority for conservation measures in the state (Frood & Calder 1987).

Notable flora: Threatened species: The Variable Spike-sedge Eleocharis minuta (Se), Mueller Daisy Brachyscome muelleroides (Se), Upright Sunray Helipterum strictum (Se), Fairy
Spectacles Menkea crassa (Se), Small Psoralea Psoralea parva (Se and listed under the Flora and Fauna Guarantee- DCNR 1995r), Silky Umbrella Grass Digitaria ammophila (Sv), Yellow-tongue Daisy Brachyscome chrysoglossa (Sv), Flaccid Flat-sedge Cyperus flaccidus (Sv), Hypsela Hypsela tridens (Sv), Small-leaf Blue-bush Maireana microphylla (Sv), Violet Swainson-pea Swainsona microcalyx (Sv), Veiled Fringe-sedge Fimbrystylis velata (Sr), Delicate Love-grass Ergrostris tenellula (Sr), Reader's Daisy Brachyscome readeri (Sr), Bear's-ears Cymbonotus lawsonianus (Sr), Woolly Buttons Leptorhynchos (Sr), Smooth Minoria Minoria integerrima (Sr), Waterbush Myoporum acuminatum (Sr), Red Bird's-foot Trefoil Lotus cruentus (Sd), Leafy Templetonia Templetonia stenophylla (Sd), Buloke Allocasuarina luehmannii (Sd), Buloke Mistletoe Amyema linophyllum (Sv) and Umbrella Wattle Acacia oswaldii (Sd) have been recorded (DCE 1990). The latter three species are found in drier areas. Moira Grass Pseudoraphis spinescens community is inadequately represented or protected in Victoria and continues to be in decline (Ward 1991, 1995a). Since altered flooding regimes threaten Moira Grass in the forest, recent advances in a Water Management Strategy aim to arrest this decline (Ward 1995b).

Fauna: Threatened species: The Superb Parrot (Sv and listed under the Flora and Fauna Guarantee- DCNR 1995q), Regent Honeyeater Xanthomyza phrygia (Se), Bush Thick-knee Burhinus magnirostris (Sv), Square-tailed Kite Lophoictinia isura (Sv), Grey-crowned Babbler Pomatostomus temporalis (Sv and listed under the Flora and Fauna Guarantee- DCNR 1995f), Swift Parrot Lathamus discolor (Sv), Great Egret Eretta alba (listed under the Flora and Fauna Guarantee- DCNR 1995e), Little Bittern Ixobrychus minutus (Sr), Freckled Duck Stictonetta naevosa (Sr and listed under the Flora and Fauna Guarantee- DCE 1992f), Blue-billed Duck australis (Sr and listed under the Flora and Fauna Guarantee- DCNR 1995v), Grey Goshawk Accipiter novaehollandiae (Sr), White-bellied Sea-eagle Haliaeetus leucogaster (Sr and listed under the Flora and Fauna Guarantee- DCNR 1995u), King Quail Cooturnix chinensis (Sr), Barking Owl Ninox connivens (Sr and listed under the Flora and Fauna Guarantee- DCNR 1995b), Ground Cuckoo-shrike Coracina maxima (Sr), Painted Snipe Rostratula benghalensis (Si), Painted Honeyeater Grantiella picta (Si), Australasian Bittern Botaurus poiciloptilus (Si) and Baillon's Crane Porzana pusilla (Si) have been recorded in Barmah Forest. Many of these species are forest/wetland birds rather than true waterbirds. Threatened fish that have been recorded are the Trout Cod Maccullochella macquariensis (Se and listed under the Flora and Fauna Guarantee- DCNR 1995t), Macquarie Perch Macquaria australasica (Sr), Murray Cod Maccullochella peeli (Se and listed under the Flora and Fauna Guarantee- DCNR 1995k), Silver Perch Bidyanus (Sr), Golden Perch Macquaria ambigu (Sr), Bony Bream Nematalosa erebi (Sv), Crimson-spotted Rainbow Fish Melanotaenia fluviatilis (Sr), Freshwater Hardyhead Craterocephalus stercusmucarum (Si), Flat-headed Galaxias Galaxias rostratus (Si) and Freshwater Blackfish Gadopsis marmoratus (Si). Threatened reptiles that have been recorded are Hooded Scaly-foot Pygopus nigriceps (Se), Bandy Bandy (unconfirmed) Vermicella annullata (Sv), Curl Snake (unconfirmed) Suta sutat (Sr) and Southern Water Skink Sphenomorphus tympanum (WTF) (Si). Only one threatened amphibian, the Barking Marsh Frog Limodinaestes fletcheri (Si), has been recorded. Threatened mammals that have been recorded are the Tiger Quoll (unconfirmed) Dasyurus maculatus (Sv and listed under the Flora and Fauna Guarantee-DCNR 1995w), Brush-tailed Phascogale Phascogale tapoatafa (Sr and listed under the Flora and Fauna Guarantee- DCNR 1995y), Squirrel Glider Petaurus norfolkensis (Sr and listed under the Flora and Fauna Guarantee- DCNR 1995x) and Large-footed Myotis Myotis adversus (Si).
Numbers: The forest has supported 5% of the Victorian population of Superb Parrot (Webster 1988). Breeding: More than 5% of the breeding sites of Superb Parrot occur in Barmah Forest (Webster 1988). In the past, Barmah Forest has supported enormous colonies of breeding waterbirds.

Effects of Water Changes on Wildlife:

Changes in the water regime have reduced the numbers but it is still an area of significance, supporting colonies of Straw-necked Ibis Threskiornis spinicollis, Australian White Ibis Threskiornis molucca, Great Cormorants Phalacrocorax carbo, Little Black Cormorants P. sulcirostris, Little Pied Cormorant P. melanoleucus, Pacific Heron Ardea pacifica, White-faced Heron A. novaehollandiae, Darter Anhinga melanogaster, Rufous Night Heron Nycticorax caledonicus, Yellow-billed Spoonbill Platalea flavipes, Maned Duck Chenonetta jubata, Pacific Black Duck Anas superciliosa as well as crakes and rails (CFL 1990a; I. Davidson pers. comm.; CNR 1995). Large breeding numbers include 300 Australian White Ibis nests at Top Island, 5000 Australian White Ibis and 6000 Straw-necked Ibis nests at Boals Deadwoods and 200 Australian White Ibis nests at Doctors Point. There are many smaller colonies throughout the forest such as Four Mile Crossing (120 nests consisting of Black, Little Black and Little Pied Cormorants, Darter and Yellow-billed Spoonbill) and Bunyip Hole (80 nests consisting of Black, Little Black and Little Pied Cormorants, and Yellow-billed Spoonbill) (Ward 1995a). Numbers of birds nest in the adjacent Millewa Forest in NSW.

Social and cultural values:

Tourism: An estimated 100 000 visitor days were spent in Barmah Forest in 1988. Many of the recreational activities, and the high visitor numbers, have detrimental side-effects for nature conservation. Research: A number of research studies have been or are being undertaken at Barmah Forest, particularly in the fields of forest ecology, floodplain ecology and hydrology eg. Bren (1984-94), Chesterfield (1984- 86), Dexter (1967-78) and Ward (1991-currently). The Integrated Watering Strategy project is investigating the ecology and hydrology of Barmah Forest. In particular, it is assessing the responses of floodplain vegetation communities to different flooding parameters (Ward 1991, 1995a). The results are being applied to a water management strategy for the forest designed to conserve the ecological diversity and functioning (Ward 1995b). Education: Barmah has a very high educational value. It receives a large number of visitors and is well suited to school camps. The Dharnya Centre, within Barmah Forest, includes a visitor centre with an information display on fauna, flora, hydrology etc. A number of interpretive leaflets are available. A part-time teacher is available to assist with education and interpretation and Aboriginal rangers are available to assist with interpretation of natural history and Aboriginal culture. Barmah is close to regional centres such as Nathalia, Numurkah, Tocumwal, Echuca and Shepparton. It is within reach of Melbourne for overnight or extended visits. Aboriginal culture: Sites include burial grounds, middens, mounds and scarred trees.

Aboriginal Heritage:

A large number (hundreds) of aboriginal sites within Barmah have only been partially surveyed and registered. These sites include burial grounds, mounds, middens, and scarred trees. Barmah
Forest was one of the more densely populated areas of Australia prior to European settlement. The descendants of the local tribes maintained close links with the Barmah Forest through the nearby Cummeragunja reserve in N.S.W. and through intermittent settlement in the Forest. The present day descendants refer to themselves as the Yorta Yorta, and have a close involvement with planning, management and interpretation at Barmah- see section on Cultural Heritage which gives an overview of site types and distribution in the area.

Land tenure:

On site: State Forest, Reference Areas, State Park, Recreation Reserve, Regional Parks.

Current land use:

On site: A wide range of activities, eg. pleasure driving, 4WD driving, trail bike riding, cycling, horse riding and bushwalking are popular. Orienteering, picnicking, camping, canoeing, boating, fishing, bait collection, duck shooting, hunting of feral animals and nature study are also undertaken (CFL 1990a). Nature conservation and grazing are overall uses of the forest.

Surrounding area: Forestry, grazing, water supply.

Disturbances or threats:

Current: Grazing, logging, water regulation, recreational impacts, pest plants, grazing.

Conservation measures taken

The Barmah Forest is listed under the Ramsar Convention and is registered under the National Estate. 7900 ha of Barmah Forest is in the Barmah State Park and 280 ha is in the Top Island and Top End Reference Areas. Other areas are within the Barmah and Tocumwal Regional Parks. Recommendations in WSC (1993) are that old River Red Gums (as identified in Table 3, p. 34 of CFL 1990a) be protected as fauna habitat, at least some sites be protected from grazing, flooding regimes be restored as close as possible to natural levels, the balance between recreational impact and ecological conservation be carefully monitored and managed, and that more information should be collected on the non-ecological values of wetlands to allow a more complete evaluation. Some grazing exclusion plots have been established in the forest for the purpose of studying the impacts of grazing on the vegetation and fire fuel loads. Some cultural sites have been fenced off. One species listed by JAMBA and CAMBA, the Great Egret, and one species listed only by CAMBA, the White-bellied Sea-eagle, has been recorded in the Barmah Forest (Department of Conservation and Natural Resources, September 1995).

Management authority and jurisdiction: Department of Conservation and Natural Resources, Barmah.

2. Broken Creek - RIV005VI
Location: Between 36°29' S 145°56' E, 8 km north north-west of Benalla and 35°57' S 144°57' E, Barmah Forest; includes Moodie Swamp 36°13' S, 145°47' E, approximately 3 km north-west of Waggarandall. Bioregion: Riverina. Shire: Moira and Delatite.

Area: 2500 ha.

Elevation: c. 130 m ASL.

Other listed wetlands in same aggregation: RIV026VI (Lower Broken River), RIV001VI (Barmah-Millewa Forest).

Wetland type(s): B4.

Criteria for inclusion: 1, 2, 3.

Site description: This wetland includes all of the floodplain associated with the Broken Creek. The floodplain is characterised by a mixture of cleared agricultural land and River Red Gum Eucalyptus camaldulensis-dominated open woodland. Moodie Swamp is the largest individual wetland within the Broken Creek floodplain.

Physical features: Geological setting: Tertiary-Quaternary alluvium. Climate: Mean and median annual rainfall at Numurkah are 453 and 455 mm respectively (BM 1995a). Average annual evaporation at Numurkah is c. 1617 mm (BM 1995b).

Hydrological features: Broken Creek is a distributary of the Broken River. Mean annual discharge in the Broken Creek at Katamatite is 9380 megalitres; mean pH and mean conductivity are 7.2 and 197 EC respectively (RWC 1990c). Mean annual discharge in the Broken Creek at Rice's Weir is 74300 megalitres; mean pH and mean conductivity are 7.0 and 174 EC respectively (RWC 1990c).

Ecological features: The Broken Creek floodplain contains flora and fauna that is threatened at the state and national levels. Several waterbird species breed on the floodplain.

Significance:

Notable flora: Threatened species: The floodplain contains the Small Psoralea Psoralea parva (Ne and listed under the Flora and Fauna Guarantee- DCNR 1995r), Yarran Wattle Acacia omalophylla (Se), Variable Spike-sedge Eleocharis minutu (Se), Mallee Golden Wattle Acacia notabilis ( Sv), Reader's Daisy Brachyscome readeri (Sr), Leafless Bluebush Maireana aphylla (Sr), Woolly Button Leptorhynchos panactioides (Sr) and Leafy Templetonia Templetonia stenophylla (Sd). Notable fauna: Composition: Moodie Swamp has supported 39 waterbird species (CNR 1995). Threatened species: The Murray Cod Maccullochella peeli (Sv and listed under the Flora and Fauna Guarantee- DCNR 1995k), Tiger Quoll Dasyurus maculatus (Sv and listed under the Flora and Fauna Guarantee- DCNR 1995w), Squirrel Glider Petaurus norfolkensis (Sr and listed under the Flora and Fauna Guarantee- DCNR 1995x), Freckled Duck Stictonetta naevosa (Nr and listed under the Flora and Fauna Guarantee- DCE 1992f), White-
belliged Sea-eagle Haliaeetus leucogaster (Sr and listed under the Flora and Fauna Guarantee-DCNR 1995u), Brolga Grus rubicundus (Sr and listed under the Flora and Fauna Guarantee-DCE 1992g), Crimson-spotted Rainbowfish Melanotaenia fluviatilis (Sr), Australasian Bittern Botaurus poiciloptilus (Si), Painted Snipe Rostratula benghalensis (Si), Barking Marsh Frog Limnodynastes fletcheri (Si) and Great Egret Egretta alba (listed under the Flora and Fauna Guarantee-DCNR 1995e) have been recorded. Numbers: Up to 100 Australasian Grebe Tachybaptus novaehollandiae, 400 White-faced Herons Ardea novaehollandiae, 500 Dusky Moorhens Gallinula tenebrosa and 500 Purple Swamphens Porphyrio porphyrio have been counted at Moodie Swamp (CNR 1995). Breeding: The Little Black Cormorant Phalacrocorax sulcirostris, Little Pied Cormorant P. melanoleucos, Royal Spoonbill Platalea regia (Src), Black Swan Cygnus atratus and Purple Swamphen have bred at Moodie Swamp (CNR 1995).

Land tenure:


Surrounding area: Township and private land.

Current land use:

On site: Nature conservation, duck hunting, water supply.

Surrounding area: Grazing.

Disturbances or threats:

Current: Adjacent irrigated dryland farms dispose of nutrients, chemicals, saline drainage and summer irrigation water into the creek. Such activities are also a source of pest plant seed.

Potential: Outfall of community surface drainage scheme - currently under construction - will flow into the creek and is likely to raise nutrient and salinity levels.

Conservation measures taken: Public Land Water Frontage Reserves and Moodie Swamp State Wildlife Reserve have been declared. One species listed by CAMBA (the White-bellied Sea-eagle) and one species listed by JAMBA and CAMBA (the Great Egret) has been recorded on the Broken Creek.

Management authority and jurisdiction: Private and Department of Conservation and Natural Resources (Department of Conservation and Natural Resources, September 1995).

3. Gunbower Island - RIV011VI

Location: Between 4 km north of Torrumbarry, 36o 00' S, 144o 31' E and Koondrook, 35o 39' S, 144o 08' E. Bioregion: Riverina. Shire: Gannawarra and Campaspe.
Area: 19 500 ha.

Elevation: 75-83 m ASL.

Other listed wetlands in same aggregation: RIV016VI (Kow Swamp), RIV013VI (Johnson's Swamp), RIV012VI (Hird's Swamp), RIV009VI (Fosters Swamp), RIV006VI (Cemetery Swamp) and other sites in the Ramsar listing of the Kerang Wetlands.

Wetland type(s): B4, B14.

Criteria for inclusion: 1, 2, 3.

Site description: Gunbower Island is bounded by the Murray River and one of its anabranches, Gunbower Creek. The island contains the second largest River Red Gum Eucalyptus camaldulensis forest in Victoria, much of which is subject to regular inundation from the Murray River.

Physical features: It is a depositional basin which contains a number of channels and miscellaneous floodplain depressions. Geological setting: Quaternary fluvial and aeolian sediments. Climate: Mean and median annual rainfall at Gunbower are 380 and 388 mm respectively (BM 1995a). Mean and median annual rainfall at Koondrook are 365 and 326 mm respectively (BM 1995a).

Hydrological features: Gunbower Forest is part of the Murray River floodplain with Pericoota and Koondrook Forests in NSW and is itself a significant wetland complex. It contains more than 150 wetland basins (Pressey 1986) occurring in a floodplain matrix with some areas never receiving inundation (Atkins et al. 1992). Mean annual discharge in the Murray River at Barmah is 3 620 000 megalitres; mean pH and mean conductivity are 7.1 and 72 EC respectively (RWC 1990d). Mean annual discharge in the Gunbower Creek at Koondrook is 100 000 megalitres; mean pH and mean conductivity are 6.9 and 199 EC respectively (RWC 1990d). Mean annual discharge in the Murray River at Torrumbarry is 5 460 000 megalitres; mean pH and mean conductivity are 7.0 and 115 EC respectively (RWC 1990d).

Ecological features: Gunbower Island is a high value wetland system for its ecological features. It is of special value for maintaining the ecological diversity of the region because of the extent to which the Murray River floodplain has been cleared for agriculture. During inundation, Gunbower Forest is a special breeding and nursery area for flood-dependent organisms such as many waterfowl, native fish species, major tree species, aquatic plants, amphibians and aquatic invertebrates.

Significance: The wetlands and the floodplain matrix are subject to different hydrological characteristics which at a gross scale produces major differences in vegetation cover. Similarly, distinct aquatic invertebrate communities are found in wetlands subject to different flooding parameters (Boulton & Lloyd 1991; Boulton & Lloyd in press), and these communities are
expected to be diverse (Atkins & Lloyd in prep.). Gunbower Forest is the second largest River Red Gum forest in Victoria and contains some of the tallest River Red Gum in Victoria.

Flora: Threatened species: Western Water Starwart Callitriche cyclocarpa (Nv), Spreading Summer-grass Digitaria divaricatissima (Sv), Brown Beetle-grass Diplachne fusca (Sr), Winged Pepper-cress Lepidium morophocissus (Ne and listed under the Flora and Fauna Guarantee-DC1992aa), Smooth Minuria Minuria integerrima (Sr) and Squat Picris Picris squarrosa (Sr) have been recorded (DCE file-wetlands unit).

Notable fauna: Composition: 21 waterbird species have been recorded in Gunbower Forest (CNR 1995). Breeding: The forest has supported the only breeding colony of the Intermediate Egret Egretta intermedia (Src) in Victoria (Horricks et al. 1989). Australian White Ibis Threskiornis molucca, Grey Teal Anas gibberifrons, Black Swan Cygnus atratus and other water birds also breed here (J. Bowen pers. comm.). Gunbower Forest has supported significant breeding populations of Nankeen Night Heron Nycticorax caledonicus (Src). Threatened species: White-bellied Sea-eagle Haliaeetus leucogaster (Sr and listed under the Flora and Fauna Guarantee-DCNR 1995u), Barking Marsh Frog Limnodynastes fletcheri (Si), Broad- shelled Tortoise Chelodina expansa (Si), Tree Goanna Varanus varius (Si) and Carpet Python Morelia spilota variegata (Sv) have been recorded. Threatened fish species include: Crimson-spotted Rainbowfish Melanotaenia fluviatilis (Sr), Golden Perch Macquaria ambigua (Sr) and Murray Cod Maccullochella peeli (Sv and listed under the Flora and Fauna Guarantee- DCNR 1995k) (Koehn & Morison 1990).

Social and cultural values: Recreation: The Gunbower Forest provides excellent recreational opportunities, and is popular for fishing, camping and hunting (where permitted). The most popular areas are adjacent to the Murray River and at Torrumbarry Weir, where a caravan park is located. The Department of Conservation and Natural Resources maintains an extensive system of fireplaces and picnic tables. Cohuna Scout Group has a camp within the Forest. Access within the Forest is good along the River Track, which provides a scenic drive from Koondrook to Torrumbarry Weir. Research: The ecology and hydrology of Gunbower Forest has been investigated. In particular, the responses of floodplain communities to different flooding parameters have been assessed. The data was used to develop a strategy. Education: Spence Bridge, an area of 230 ha, has been set aside as an Education Area (DCE files-wetlands unit).

Land tenure:

On site: State Forest, River Murray, Education Area.
Surrounding area: State Forest- NSW, private land.

Current land use:

On site: Fishing, camping, hunting- where permitted.
Surrounding area: Grazing, cropping.

Disturbances or threats:
Current: Altered flooding regime from river regulation, grazing, inappropriate recreational activities, illegal deposition of irrigation drainage.

Potential: Not known.

Conservation measures taken: Gunbower Forest is listed under the Ramsar Convention and on the Register of the National Estate. One species listed only under CAMBA, the White-bellied Sea-eagle, has been recorded at Gunbower Island.

Management authority and jurisdiction: Department of Conservation and Natural Resources (Parks and Reserves Section, National Parks Service, Department of Conservation and Natural Resources, September 1995).

**Australian Ramsar Sites - Site 15 Gunbower Forest**

**DESIGNATED**: 15 December 1982

**GEOGRAPHICAL COORDINATES:**

Latitude (approx) 35° 39' to 36° 00'S
Longitude (approx) 144° 08' to 144° 30'E

**GENERAL LOCATION**: North-central Victoria, Australia, approximately 30 kilometres north-west of Echuca.

**AREA**:

19,450 hectares

**WETLAND TYPE**:

Inland Wetlands - 11, 9, 2

**ELEVATION**:

Approx 80 metres

**OVERVIEW**: Gunbower Forest is the second largest Red Gum forest in Victoria, and is subject to periodic inundation from the Murray River when it supports large numbers of breeding waterfowl.

**PHYSICAL FEATURES**: 
Physiography and Geology

Gunbower Forest is a long shallow depression lying between the banks of the Murray River and Gunbower Creek. Soils in the area are predominantly grey/brown clays.

Flood Regime

Gunbower Island is a depositional basin which contains a number of lentic channels and miscellaneous floodplain depressions. The lowest and therefore major entry point for water into the forest is Spur Creek which runs when the Murray River height at Echuca reaches four metres. All the channels and depressions from Spur Creek are more or less connected to the Little Gunbower Creek which, at its junction with Gunbower Creek, is the main exit point for floodwaters. As the Murray River rises other effluents begin to flow, until the forest is entirely inundated. This usually occurs when the Echuca river height is approximately eight metres. Water depth on the island can vary from a few centimetres on high ground to six metres in creeks and billabongs in the centre of the forest during flood. River regulation has caused a change in the natural flood regime. Prior to the completion of the Torrumbarry Lock in 1923 there was little control exerted on water flow except for small scale damming by locals to prevent flooding. Since then Gunbower Creek has been maintained at flood level during the irrigation season (August to May) by three weirs at Gunbower, Cohuna and Koondrook resulting in a protracted flood period for the island, regulators between Gunbower Creek and the forest prevent water entering the forest during these times.

ECOLOGICAL FEATURES:

The distribution of plant species and communities on Gunbower Island is largely a result of minor differences in elevation which determine the frequency and duration of flooding and grazing practices.

River Red Gum (Eucalyptus camaldulensis) forest is widely distributed across the north-western part of Gunbower Forest, in areas that are inundated the most frequently. In general, this part of the island is at a slightly lower elevation. Gunbower Forest is approximately 53km in length, with a fall in elevation of on average 0.2m per km.

Black Box (E. largiflorens) woodland occurs on low rises and sand ridges where flooding occurs infrequently. In the forest, this community is most abundant at the south-east end of the island, but it also occurs along the length of Gunbower Creek.

The other eucalypt present in numbers on the island, Grey Box (E. microcarpa) occurs on sandy ridges which are rarely flooded. This species often grows in association with Black Box and occasionally with River Red Gum. In addition, some small grassy plains and swamp vegetation occur within the forest.

During flood periods, the forest becomes a large waterbird breeding area. The only record of Intermediate Egret breeding in Victoria is in the Gunbower Forest (in 1974 there were an estimated 500 nests, and in 1982 there were over 100 nests). Sections of the forest also support
breeding colonies of the Rufous Night Heron (Nycticorax caledonicus), the Little Egret (Egretta garzetta), and the Great Egret (Egretta alba).

LAND TENURE:

Gunbower is managed by Department of Conservation and Environment as State Forest. The eastern half (9,712 ha) is also a proclaimed Wildlife Sanctuary and all land between the River and the "River Track" is part of the River Murray Reserve.

CONSERVATION MEASURES TAKEN:

Study of water requirements as part of Integrated Watering Strategy (Benalla Region, Department of Conservation and Environment); Proclamation of Wildlife Sanctuary.

CURRENT LAND USE:

Timber production, grazing, nature conservation, recreation, apiculture, flood mitigation, sand and gravel supply

POSSIBLE THREATS:

The introduction of river regulation in 1934 has reduced the frequency, intensity and duration of flooding in Gunbower Forest, which has important implications for River Red Gum and other species whose survival is flood dependant. Timber harvesting and silvicultural practices alter the age structure of Red Gum stands and may reduce the number of nest hollows available to wildlife.

Grazing by introduced and domestic animals poses a significant threat to understorey communities.

Threatened Species: White-bellied Sea-Eagle (Haliaeetus leucogaster) - rare in Victoria Barking Marsh Frog (Limnodynastes fletcheri) - Insufficiently known in Victoria Broad-shelled Tortoise (Chelodina expansa) - Insufficiently known in Victoria Tree Goanna (Variants varies) - Insufficiently known in Victoria Carpet Python (Morella spilt variegate) - vulnerable in Victoria

FLORA: Threatened Species

Acacia osswaldii (Umbrella Wattle) - depleted in Victoria
Allocasuarina leuhmannii (Buloke) - depleted in Victoria
Amyema linophyllum (Buloke Mistletoe) - vulnerable in Victoria
Callitriche cyclopcarpa (Western Water Starwort) - Poorly known in Australia, rare in Victoria
Digitaria divaricatissima (Spreading Summer-grass) - vulnerable in Victoria
Diplachne fusca (Brown Beetle-grass) - rare in Victoria
Hakea tephrosperma (Hooked Needlewood) - depleted in Victoria
Lepidium monoplocoides (Winged Pepper-cress) - endangered in Australia, endangered in Victoria
Minuria integerrima (Smooth Minuria) - rare in Victoria
Myoporum deserti (Turkey Bush) - depleted in Victoria
Picris squarrosa (Squat Picris) - rare in Victoria
Santalum acuminatum (Sweet Quandong) - depleted in Victoria

CURRENT CONSERVATION EDUCATION: Integrated Watering Strategy is being developed. Spence Bridge, an area of 230 ha, has been set aside as an Education Area. The area is to be used to provide opportunities for students of all ages to:

(a) Study the nature and functioning of reasonably natural ecosystems in a manner such that the integrity of these ecosystems is maintained as far as practicable;

(b) compare the ecosystems within education areas with other nearby natural and modified systems;

(c) observe and practise of methods of environmental analysis, and the field techniques of the natural sciences; and

(d) conduct simple long-term experiments aimed at giving an understanding of the changes occurring in an area with time.

CURRENT RECREATION AND TOURISM:

The Forest with its many wetlands, creeks and effluence provides excellent recreation opportunities, and is popular for fishing, camping, and hunting. The convoluted course of the Murray River provides many fishing spots. Wildlife, particularly waterfowl are plentiful.

The most popular spots for recreation are along the Murray and at Torrumbarry Weir, where a formal caravan park is located. The Department of Conservation and Environment maintains an extensive system of fireplaces and picnic tables.

Cohuna Scout Group has a camp within the Forest. Access within the forest is good and includes the River Track, which provides a scenic drive from Koondrook to Torrumbarry Weir.

MANAGEMENT AUTHORITY:

Department of Conservation and Environment, PO Box 41, East Melbourne Victoria 3002.

JURISDICTION:

Government of Victoria.

4. Kanyapella Basin - RIV014VI
Location: 36° 09' S, 144° 54' E; 13 km east south-east of Echuca. Bioregion: Riverina. Shire: Campaspe.

Area: 2581 ha.

Elevation: c. 95 m ASL.

Other listed wetlands in same aggregation: RIV001VI (Barmah-Millewa Forest).

Wetland type(s): B10, B14.

Criteria for inclusion: 1, 2, 3.

Site description: The lower portion of Kanyapella Basin is River Red Gum Eucalyptus camaldulensis open forest. The outer edges of the Basin has a sparser cover of River Red Gum, Black Box E. largiflorens and Grey Box E. microcarpa open woodland with a grassy understorey.

Physical features: The basin is a large ancestral playa. Much of the basin has been divided into shallow ponds separated by bunds. Geological setting: Quaternary alluvium.

Hydrological features: The hydrology of the basin is based on times of high flood in the Goulburn River, when the Cobram, Tongala and Wyuna Drains flow into the basin. This water is held in the basin until the river is low enough to allow drainage of the basin.

Ecological features: Kanyapella Basin is a high value wetland for its flora and fauna. The eucalyptus forests of the basin support breeding waterfowl and several threatened fauna species.

Significance: The basin contains areas of open water, areas of water supporting dense vegetation and patches of trees with hollows which all provide suitable habitat for waterfowl species. The extent of the River Red Gum/Black Box association at Kanyapella Basin is the most significant example in the region (B. Wehner pers. comm.).

Notable flora: Threatened species: Barren Cane Grass Eragrostis inefcunda (Sd) and Woolly Buttons Leptorhynchos panaetioides (Sr) have been recorded in the Kanyapella Basin (Disken & Meyer 1991).

Notable fauna: Composition: 12 waterbird species have been recorded at the Kanyapella Basin (CNR 1995). Threatened species: The Bush Thick-knee Burhinus magnirostris (Sv), Barking Owl Ninox connivens (Sr and listed under the Flora and Fauna Guarantee- DCNR 1995b), Brolga Grus rubicundus (Sr and listed under the Flora and Fauna Guarantee- DCE 1992g), Painted Snipe Rostratula benghalensis (Si), Pied Cormorant Phalacrocorax varies (Src), Great Egret Egretta alba (Src and listed under the Flora and Fauna Guarantee- DCNR 1992e), Rufous Night Heron Nycticorax caledonicus (Src) and Royal Spoonbill Platalea regia (Src) have been recorded in the Basin (Disken & Meyer 1991; R. Weber and D. Wyatt pers. comm.). The former two species are woodland/forest birds. Breeding: The
basin forms an important breeding area for waterfowl, in particular the Maned Duck Chenonetta jubata, Musk Duck Biziura lobata, Pacific Black Duck Anas superciliosa and Grey Teal A. gibberifrons.

Social and cultural values: Recreation: Use of Kanyapella Basin is not as high as that experienced by the nearby Goulburn River and Barmah-Millewa Forest due to restricted vehicular access (into the Wildlife Co-operative Area) and few visitor facilities. Camping, horse riding, duck hunting, bait collection, motor bike riding, hunting (feral animals), bushwalking and nature study are undertaken. Access is limited to the drier times of the year, as tracks can be impassable after periods of heavy rain and flooding. Aboriginal culture: Kanyapella Basin has high cultural value for its Aboriginal heritage. Sites include a midden and scarred canoe trees.

Land tenure:

On site: 2581 ha is within a recommended Wildlife Management Co-operative Area.

Surrounding area: Private land.

Current land use:

On site: Recreation, grazing.

Surrounding area: Grazing, cropping.

Disturbances or threats:

Current: Artificial hydrological regime.

Potential: Not known.

Conservation measures taken: Managed as the Kanyapella Basin Wildlife Management Co-operative Area. One species listed under JAMBA and CAMBA, the Great Egret, has been recorded in the Kanyapella Basin.

Management authority and jurisdiction: The Kanyapella Basin public land is managed cooperatively by the Rural Water Corporation and Department of Conservation and Natural Resources primarily to provide habitat for waterfowl (LCC 1989).

Compiler & date: Parks and Reserves Section, National Parks Service, Department of Conservation and Natural Resources, September 1995.

5. Kow Swamp - RIV016VI

Location: 35° 57' S, 144° 17' E; 20 km south-east of Cohuna. Bioregion: Riverina. Shire: Campaspe.
Area: 2724 ha.

Elevation: > 80 m ASL.

Other listed wetlands in same aggregation: RIV011VI (Gunbower Island) (listed under the Ramsar Convention), RIV012VI (Hird's Swamp), RIV013VI (Johnson's Swamp), RIV009VI (Fosters Swamp), RIV006VI (Cemetery Swamp) and other sites in the Ramsar listing of the Kerang Wetlands.

Wetland type(s): C1, B5.

Criteria for inclusion: 1, 2, 3, 6.

Site description: Kow Swamp is a permanent open freshwater wetland. This area is used as water storage for the irrigation system.

Physical features: Geological setting: Quaternary fluvial and aeolian sediments of the Woorinen and Shepparton Formations. Climate: Mean and median annual rainfall at Kow Swamp are 329 and 310 mm respectively (BM 1995a).

Hydrological features: The swamp used to be a deep freshwater marsh and is very fresh (100-400 EC). It is fed by a branch of the Gunbower Creek (an anabranch of the Murray River) and the Mount Hope Creek, and is connected to Hird's Swamp (downstream) by Box Creek and Pyramid Creek. Mean annual discharge in Mount Hope Creek at Mitiamo is 35 200 megalitres; mean pH and mean conductivity are 7.5 and 1460 EC respectively (RWC 1990d).

Ecological features: Kow Swamp is a high value wetland for its large size, habitat diversity and for the breeding opportunities it provides for waterbirds. The swamp has five distinctive habitat subcategories: shallow open water, River Red Gum, dead timber, rushes and reed habitat. Its native vegetation, waterbird species diversity, waterbird breeding, fish, mammals, reptiles and amphibians are of high value.

Significance: Kow Swamp is a significant archaeological site. It is the largest permanent wetland in the Victorian part of the Riverina. It is classified as semi-remote which is unusual in the Kerang Lakes area (Heron & Nieuwland 1989).

Notable flora: Threatened species: The Swamp Buttercup Ranunculus undosus (Sv) occurs in this area (O'Donnell 1990). Composition: Kow Swamp supports 57 plant species (DCNR undated a). Beauglehole (1986) has identified several species in this area that are considered to be of very limited distribution in the Murray Valley: Southern Swamp Wallaby Grass Amphibromus neesii, Tall Sedge Carex appressa, Rush Sedge C. teretecaulis, Common Rush Juncus usitatus, Bonefruit Osteocarpum salsuginosum and Water Ribbons Triglochin procera. Cumbungi Typha sp. is a critical plant in the wetland.

Notable fauna: Breeding: The habitat diversity and size of Kow Swamp provides breeding opportunities for significant numbers of Australian White Ibis Threskiornis aethiopica and
Straw-necked Ibis *T. spinicollis* (Pressey 1986b). Other breeding species are: Darter Anhinga melanogaster (*Src*), Little Pied Cormorant *Phalacrocorax melanoleucos*, White-faced Heron *Ardea novaehollandiae*, Yellow-billed Spoonbill *Platalea flavipes* and Australian Shelduck *Tadorna tadornoides* (CNR 1995). Composition: 27 waterbird species have been recorded at Kow Swamp. It is an important area for the conservation of native fish as it supports large numbers of native fish including threatened species such as Silver Perch *Bidyanus bidyanus* (*Sv*), Golden Perch *Macquaria ambigua* (*Sr*) and Freshwater Blackfish *Godopsis marmoratus* (*Si*) (Lugg et al. 1989). Kow Swamp is a major drought refuge for waterbirds due to its large size.

Social and cultural values: Aboriginal culture: Kow Swamp has been the subject of several archaeological studies and has been found to be very significant (Thorne & Raymond 1989; VAS 1992). Human skeletal remains dating between 10 000-15 000 years have been found (VAS 1992). Examination of these remains has revealed that the skeleton was of a different origin to the now famous 'Lake Mungo Woman' found in South Australia, suggesting cohabitation of a more modern race originating in China. Research: The hydrology of the swamp has also been studied (Macumber 1991). Recreation: The area has a well maintained and compact picnic area but otherwise there is limited access to the wetland. There are opportunities for recreational fishing.

Land tenure:

On site: Irrigation storage; sanctuary.

Surrounding area: Private land, Public Land Water Frontage Reserve- on Box Creek and Mount Hope Creek.

Current land use :

On site: Grazing on southern shoreline, recreational fishing. Used to be worked by professional fisherman.

Surrounding area: Grazing.

Disturbances or threats :

Current: Predation from feral foxes poses a threat to native wildlife. Grazing on the south shoreline has degraded vegetation and reduced the natural values of the area. Similarly, beds of native waterplants have deteriorated in the past 40 years. Use of the swamp's water in the irrigation water supply system limits the potential for improvements in wetland values (Lugg et al. 1989). Bank erosion is a problem.

Potential: Not known.

Conservation measures taken : Listed as a Sanctuary. Recommendations in Lugg et al. (1989) are: water levels to be allowed to fluctuate as much as possible- high in winter-spring and low in summer-autumn, the water level be allowed to decline by evaporation, the wetland be allowed to
dry periodically, public land areas be fenced, all grazing be discontinued (if the wetland remains part of the irrigation system), an assured water supply be provided to all areas of the wetland, and salinity be maintained at less than 1500 EC. One species listed by JAMBA and CAMBA, the Latham's Snipe Gallinago hardwickii, has been recorded (CNR 1995).

Management authority and jurisdiction: Managed by the Rural Water Corporation.

Compiler & date: Parks and Reserves Section, National Parks Service, Department of Conservation and Natural Resources, September 1995.

6. Lower Broken River - RIV026VI

Location: Between 36o 29' S 145o 56' E, 8 km north north-west of Benalla and 36o 24' S 145o 23' E, Shepparton. Bioregion: Riverina. Shire: Greater Shepparton (City), Delatite and Strathbogie.

Area: 1268 ha.

Elevation: 110-115 m ASL.

Other listed wetlands in same aggregation: RIV027VI (Lower Goulburn River Floodplain).

Wetland type(s): B1, B4.

Criteria for inclusion: 3, 6.

Site description: The Lower Broken River downstream of Casey's Weir meanders for over 63 km through plains country before reaching the Goulburn River at Shepparton. The floodplain is narrow (often no greater than 40 m wide).

Physical features: Geological setting: Quaternary alluvium on Tertiary-Quaternary alluvium. Climate: Mean and median annual rainfall at Goorambat are 552 and 543 mm respectively (BM 1995a). Average annual evaporation at Dookie is 1245 mm (BM 1995b). Mean and median annual rainfall at Kialla East are 497 and 505 mm respectively (BM 1995a).

Hydrological features: The billabongs within the floodplain are remnants of the prior river courses and are generally less than one hectare in area. The billabongs vary in shape from saucer-like to cut-off loops. Mean annual discharge in the Broken River at Goorambat is 234 000 megalitres; mean pH and mean conductivity are 7.4 and 162 EC respectively (RWC 1990c). Mean annual discharge in the Broken River at Benalla is 287 000 megalitres (RWC 1990c).

Ecological features: The floodplain is of high value for its fauna and contains a large area of habitat for fauna such as waterbirds and fish. The dominant vegetation type is continuous River Red Gum Eucalyptus camaldulensis open forest. It has a wide variety of wetland types and is a good example of a major floodplain system.
Significance: Both Squirrel Gliders Petaurus norfolcensis and Brush-tailed Phascogales Phascogale tapoatafa have been observed along the Broken River near Shepparton and in the forested hills around Warrenbayne on Five Mile Creek. The Lower Broken River with its continuous River Red Gum fringe is the only corridor of remnant vegetation which connects the two populations. Protection of this corridor thus assists in their survival.

Notable flora: No detailed flora assessment has been undertaken along the Lower Broken River.

Notable fauna: Composition: Woodland that fringes the Lower Broken River has supported at least 10% of the regional populations of Squirrel Glider and Brush-tailed Phascogale (I. Davidson, pers. comm.). Threatened species: The Regent Honeyeater Xanthomyza phrygia (Se), Bush Thick Knee Burhinus magnirostris (Sv), Freckled Duck Stictonetta naevosa (Nr and listed under the Flora and Fauna Guarantee- DCE 1992f), Baillon’s Crane Porzana pusilla (Si), Royal Spoonbill Platalea regia (Src), Brush-tailed Phascogale (Sr), Squirrel Glider (Sr), Macquarie Perch Macquaria australasica (Sv and listed under the Flora and Fauna Guarantee- DCNR 1995j), Murray Cod Maccullochella peeli (Sv and listed under the Flora and Fauna Guarantee- DCNR 1995k) and Crimson-spotted Rainbowfish Melanotaenia fluviatilis (Sr) have been recorded for the Lower Broken River (Hawdon 1992). Breeding: The Lower Broken River has supported at least 10% of the regional breeding populations of Squirrel Glider and Brush-tailed Phascogale (I. Davidson, pers. comm.).

Social and cultural values: Recreation: The area of public land along the Lower Broken River receives many visitors, in particular along the frontage adjoining Shepparton which is readily accessible along its entire northern bank. Elsewhere, access to both sides of the river is generally limited to roads which end at the river. Recreational activities are listed below.

Land tenure:

On site: Public Land Streamside Reserves, private land.

Surrounding area: Private land, Dookie Campus- Victorian College of Agriculture and Horticulture, Bushland Reserve.

Current land use:

On site: Swimming, cycling and nature study, fishing; boating, walking, duck hunting, camping, water supply, education.

Surrounding area: Grazing, education, urban area- Shepparton.

Disturbances or threats:

Current: The floodplain has been partially modified by clearing, cultivation and irrigation.
Potential: Not known.

Conservation measures taken: Large sections of the Lower Broken River are reserved as Public Land Streamside Reserves.

Management authority and jurisdiction: Private, Department of Conservation and Natural Resources.

Compiler & date: Parks and Reserves Section, National Parks Service, Department of Conservation and Natural Resources, September 1995.

7. Lower Goulburn River Floodplain- RIV027VI

Location: The Lower Goulburn River Floodplain extends for approximately 150 km downstream of Goulburn Weir (36° 43' S, 145° 10' E, 8 km north of Nagambie) to its junction with the Murray River (36° 06' S, 145° 47' E, 7 km east north-east of Echuca). Bioregion: Riverina. Shire: Strathbogie, Greater Shepparton (City), Campaspe and Moira.

Area: 13 000 ha.

Elevation: 96 m ASL.

Other listed wetlands in same aggregation: RIV026VI (Lower Broken River).

Wetland type(s): B4, B14.

Criteria for inclusion: 1, 2.

Site description: This floodplain forms a system separate from the floodplain upstream as its flow regime is directly controlled by the Goulburn Weir, which diverts water to the Shepparton Irrigation Region. The floodplain consists of a River Red Gum Eucalyptus camaldulensis open forest/woodland with smaller areas of Grey Box E. microcarpa open forest/woodland associated with Yellow Box E. melliodora, White Box E. albens and Black Box E. largiflorens occurring on higher ground within the forest.

Physical features: Geological setting: Recent alluvium fringed by Devonian-Silurian sediments and Devonian Broadford Formation sediments. Climate: Mean and median annual rainfall at Goulburn Weir are 548 and 552 mm respectively (BM 1995a). Average annual evaporation at Tatura is c. 1375 mm (BM 1995b). Mean and median annual rainfall at Kialla East are 497 and 505 mm respectively (BM 1995a).

Hydrological features: There are a large number and variety of permanent and temporary wetlands within the floodplain, including billabongs, sloughs, marginal swamps, potholes, scroll swales, anabranches and cut-off loops. Mean annual discharge in the Goulburn River at
Goulburn Weir, Nagambie, is 1 340 000 (RWC 1990c). Mean annual discharge in the Goulburn River at McCoy Bridge is 1 680 000 megalitres; mean pH and mean conductivity are 7.0 and 228 EC respectively (RWC 1990c).

Ecological features: The Lower Goulburn River is a high value wetland system for its ecological features. The floodplain consists of a large area of habitat for fauna such as waterbirds and fish. It has a wide variety of wetland types and is an excellent example of a major floodplain system.

Significance: The system provides a major area of natural ecosystems within a large, intensively cleared irrigation and grazing region. It forms an important breeding area for waterbirds (including many colonial nesting species). The Lower Goulburn River contains excellent examples of River Red Gum open forests and woodland communities (LCC 1991).

Notable flora: Threatened species: Western Water Starwort Callitriche cyclocarpa (Sr), Smooth Minuria Minuria integerrima (Sr), Waterbush Myoporum acuminatum (Sr), River Bitter-cress Rorippa eustylis (Sr), Kangaroo Grass Themeda triandra (Sr), White Cypress-pine Callitris glaucophylla (Sr) and Buloke Allocasuarina luehmannii (Sr) have been recorded (LCC 1991).

Notable fauna: Composition: 34 waterbird species have been recorded at Gemmills Swamp (CNR 1995). Numbers: The Lower Goulburn River Floodplain and woodlands fringing this system has supported at least 5% of the Victorian populations of Squirrel Glider Petaurus norfolcensis (Sr), White-bellied Sea-eagle Haliaeetus leucogaster (I. Davidson, pers. comm.), Great Egret Egretta alba (Src) and Murray River Crayfish Euastacus armatus (R. Weber, pers. comm.). It also has supported 10% of the regional populations of Darter Anhinga melanogaster (Src and Royal Spoonbill Platalea regia (Src) (R. Weber, pers. comm.). Counts of over 1000 ibis have regularly been made at Reedy Swamp (R. Weber pers. comm.). Threatened species: The Murray Cod Maccullochella peeli (Sv and listed under the Flora and Fauna Guarantee- DCNR 1995k) populations in the Lower Goulburn River and their habitat are highly valued because of the decline in their abundance elsewhere in Victoria (Anderson & Morison 1988). Other threatened fauna (Baker-Gabb 1991) recorded within or fringing the Lower Goulburn River Floodplain include the Magpie Goose Anseranas semipalmata (Si), Bush Thick-knee Burhinus magnirostris (Sv), Superb Parrot Polytelis swainsonii (Sv and listed under the Flora and Fauna Guarantee- DCE 1992g), Swift Parrot Lathamus discolor (Sv), Grey-crown Babbler Pomatostomus temporalis (Sv), Lewin's Rail Rallus pectoralis (Sr), Little Bittern Ixobrychus minutus (Sr), White-bellied Sea-eagle (Sr and listed under the Flora and Fauna Guarantee-DCNR 1995u), Ground Cuckoo-shrike Coracina maxima (Sr), Painted Honeyeater Grantiella picta (Sr), Turquoise Parrot Neophema pulchella (Sr), Barking Owl Ninox connivens (Sr and listed under the Flora and Fauna Guarantee- DCNR 1995b), Australasian Bittern Botaurus poiciloptilus (Si), Baillon's Crane Porzana pusilla (Si), Great Egret (listed under the Flora and Fauna Guarantee- DCNR 1995e), Brush-tailed Phascogale Phascogale tapoatafa (Sr), Squirrel Glider Petaurus norfolcensis (Sr), Large-footed Myotis Myotis adversus (Sr), Trout Maccullochella macquariensis (Se and listed under the Flora and Fauna Guarantee- DCNR 1995t), Macquarie Perch Macquaria australasica (Sv and listed under the Flora and Fauna Guarantee- DCNR 1995j), Silver Perch Bidyanus bidyanus (Sv), Murray Cod Maccullochella peeli (Sv and listed
under the Flora and Fauna Guarantee- DCNR 1995k), Freshwater Catfish Tandanus tandanus (Sv), Crimson-spotted Rainbowfish Melanotaenia fluviatilis (Sr), Golden Perch Macquaria ambigua (Sr), Unspecked Hardyhead Craterocephalus stercusmuscaram fulvus (Sr), Dwarf Flat-headed Gudgeon Philypnodon sp. (Si), Carp Gudgeon species complex Hypseleotris spp. (Si), Murray River Crayfish Euastacus armatus (Si), Barking Marsh Frog Limnodynastes fletcheri (Si) and Mountain Galaxias Galaxias olidus (Si). The Great Egret, Little Bittern and Blue-billed Duck have occurred at Gemmills Swamp (CNR 1995). Breeding: The Australian White Ibis Threskiornis aethiopica, Royal Spoonbill Platalea regia (Src), Yellow-billed Spoonbill P. flavipes, Black Swan Cygnus atratus, Pacific Black Duck Anas superciliosa, Grey Teal A. gibberifrons, Musk Duck Biziura lobata, Dusky Moorhen Gallinula tenebrosa, Purple Swamphen Porphyrio porphyrio, Eurasian Coot Fulica atra and Masked Lapwing Vanellus miles have bred at Gemmills Swamp (CNR 1995).

Social and cultural values: Recreation: The area of public land along the Lower Goulburn floodplain provides significant and varied outdoor recreation opportunities. Recreational usage and visitation levels vary from very high at recreation reserves between the urban areas of Shepparton and Mooroopna, to low along sections where access is difficult. Generally, due to the large number of access points to the floodplain and the extensive network of seasonal vehicle tracks within the floodplain forest, recreational use is dispersed over the length of the floodplain. Research: A number of studies have been undertaken along the Lower Goulburn River particularly in the fields of warm water ecology and environmental salinity impacts. The Murray Cod populations are important as a source of brood stock for the Native Fish Breeding Program based at Snobs Creek Fish Hatchery. Education: The Lower Goulburn River Floodplain is easily accessible from the large regional centre of Shepparton. Moira Park Scout Camp is on the banks of the Goulburn River and can cater for large numbers of Scouts.

Aboriginal culture: The Lower Goulburn River Floodplain has high cultural value for its Aboriginal heritage. Sites include scarred trees, oven mounds and artefact scatters.

Land tenure:

On site: The Lower Goulburn River Floodplain is mostly State Forest but includes Public Land Water Frontage Reserves, Loch Garry Wildlife Management Co-operative Area, Reedy Swamp State Wildlife Reserve and township- Shepparton, State Wildlife Reserve.

Surrounding area: Recreation Reserve.

Current land use:

On site: Driving, motor bike riding, horse riding, nature study and picnicking, walking, camping, fishing, boating- including canoeing, duck hunting, water supply.

Surrounding area: Grazing, irrigated cropping.

Disturbances or threats:
Current: Sedimentation due to land clearance, fertiliser runoff, higher groundwater due to irrigation.

Potential: Not known.

Conservation measures taken: The Goulburn River has been listed as a Victorian Heritage River (LCC 1991). Two State Wildlife Reserves (Gemmill Swamp Wildlife Reserve: 173 ha and Reedy Swamp State Wildlife Reserve: 224 ha) and the Loch Garry Wildlife Management Cooperative Area (687 ha) are included within the floodplain: the wetlands of the floodplain have been grouped together because of their large number. 70 sites have been listed in CNR (1995). One species listed by JAMBA and CAMBA, Latham's Snipe Gallinago hardwickii, and one species listed only by CAMBA, White-bellied Sea-eagle, have been recorded on the Goulburn River.

Management authority and jurisdiction: Department of Conservation and Natural Resources and private.

Compiler & date: Parks and Reserves Section, National Parks Service, Department of Conservation and Natural Resources, September 1995.

8. Muckatah Depression - RIV032VI

Location: The Muckatah Depression extends from 36° 04' S, 146° 07' E, 11 km south-east of Yarrawonga to 36° 06' S, 145° 28' E, 2 km east of Numurkah and includes Dowdles Swamp, 36° 07' S, 146° 02' E, 11 km south south-west of Yarrawonga. Bioregion: Riverina. Shire: Moira, Milawa and Indigo.

Area: Total area 2909 ha (2017 ha - depression, 892 ha - off-depression).

Elevation: 115-135 m ASL.

Other listed wetlands in same aggregation: RIV005VI (Broken Creek), RIV001VI (Barmah-Millewa Forest).

Wetland type(s): B4, B10.

Criteria for inclusion: 1, 2.

Site description: The Muckatah Depression flows through Dowdles Swamp and meanders for a further 60 km, with inflow from other off-depression wetlands before entering the Broken Creek, upstream of Numurkah.

Physical features: Geological setting: Recent alluvial sediments on Quaternary alluvial Coonambidgal Formation and Pliocene-Pleistocene alluvial Shepparton Formation.
Hydrological features: The Muckatah Depression consists of one long continuous narrow wetland (20-100 m wide) within the prior stream depression and off-depression saucer-shaped wetlands up to or exceeding 40 ha in area which drain into the depression. The catchment is relatively flat and the depression is only slightly incised into the surrounding alluvial plain, being rarely more than 50 cm deep. The depression system is an important tributary of the Broken Creek RIV005VI.

Ecological features: The Muckatah Depression is a high value wetland for its ecological features. The wetlands in this system are mainly sedge-dominated freshwater meadows with some herb-dominated freshwater meadows and sedge or River Red Gum Eucalyptus camaldulensis-dominated shallow freshwater marshes. Grey Box E. microcarpa occurs in the bed and along the margin of some reaches of the depression. River Red Gum dominates Dowdles Swamp and can also be found within areas of the depression which naturally flood more frequently and for longer durations.

Significance:

Notable flora: Threatened species: Barren Cane Grass Eragrostis inecunda (Sd) (this grass is particularly abundant at Saunders Swamp) and Yellow-tongue Daisy Brachyscome chrysoglossa (Sv) (R. Weber, pers. comm.) have been recorded in the Muckatah Depression (Briggs & Leigh 1988).

Notable fauna: Number: The Muckatah Depression system has supported at least 5% of the Victorian population of Brolga Grus rubicundus (Sr and listed under the Flora and Fauna Guarantee- DCE 1992f) (R. Weber, pers. comm.). Brolga have been recorded nesting at one wetland and there have been widespread observations on other wetlands and in the Depression itself. Breeding: The Muckatah Depression system has supported at least 5% of the Victorian breeding population of Brolga (R. Weber, pers. comm.). The larger off-depression wetlands (Saunders Swamp, Dowdles Swamp, Kels Swamp and Kinnairds Swamp) are important breeding areas for waterfowl, ibis species and other waterbirds. Threatened species: The Great Egret Egretta alba (listed under the Flora and Fauna Guarantee- DCNR 1995e) has been recorded (Camp Scott Furphy 1992 unpub.; Hawdon 1992 unpub.).

Social and cultural values: Recreation: Use of the freehold portion of the wetland system is limited to duck hunting with land-holder permission. Dowdles Swamp is used for camping, nature study and duck hunting. The only visitor facilities provided are rubbish bins. Research: As part of the feasibility study for surface drainage of the Muckatah Depression, an environmental study (including some fauna and flora surveys) of sites along the Muckatah Depression was undertaken in 1991 (Scott, Camp & Furphy 1992).

Land tenure:

On site: Dowdles Swamp is a State Wildlife Reserve, private land.

Surrounding area: Private land.
Current land use:

On site: Grazing, cropping, duck hunting.

Surrounding area: Grazing, cropping.

Disturbances or threats:

Current: The agricultural land has been extensively modified by clearing, cultivation and irrigation.

Potential: Fertiliser, irrigation-induced salinity, clearing.

Conservation measures taken: Dowdle Swamp is gazetted as a State Wildlife Reserve. One species listed by JAMBA and CAMBA (the Great Egret) has been recorded at the Muckatah Depression.

Management authority and jurisdiction: Private and Department of Conservation and Natural Resources.

Compiler & date: Parks and Reserves Section, National Parks Service, Department of Conservation and Natural Resources, September 1995.

9. Black Swamp - RIV003VI

Location: 36° 10' S, 146° 19' E; 13 km west of Springhurst. Bioregion: Riverina. Shire: Milawa.

Area: 176 ha.

Elevation: c.145 m ASL.

Other listed wetlands in same aggregation: None.

Wetland type(s): B14.

Criteria for inclusion: 1, 3.

Site description: Black Swamp is a River Red Gum Eucalyptus camaldulensis-dominated shallow freshwater marsh with a herb-dominated understorey. It is situated on a gently undulating extensively cleared plain between the floodplains of the Murray and Ovens Rivers.

Physical features: Black Swamp forms a large shallow depression at the confluence of two streams. Several other shallow depressions also occur at intervals along these streams both upstream and downstream of this swamp. Geological setting: Pliocene-Pleistocene alluvial sediment of the Shepparton Formation. Climate: Mean and median annual rainfall at Peechelba
East are 548 and 535 mm respectively (BM 1995a). Average annual evaporation at Rutherglen is c. 1547 mm (BM 1995b).

Hydrological features: This swamp is mainly fed by a drainage line that is a tributary of the Black Dog Creek. This and other poorly-defined drainage lines link the various disjunct wetlands in the area during seasons of high rainfall.

Ecological features: Black Swamp supports a large variety of bats, woodland birds and waterbirds.

Significance: Black Swamp is a high value wetland for its ecological, educational, scientific, cultural and scenic features. Black Swamp supports a high diversity and number of birds. Such diversity and density reflects the value of the habitat and the lack of availability of suitable alternative habitat elsewhere in the locality. Extensive land clearing and drainage has resulted in the destruction of most of the private wetlands in this area. Black Swamp, being the only public wetland in the area, has escaped much of the devastation and is therefore a very significant remnant of what was once possibly a relatively common wetland type in the area. Black Swamp is a good example of a shallow freshwater marsh in this section of the Riverina.

Notable fauna: Composition: 35 waterbird species have been recorded at Black Swamp (CNR 1995). Lumsden (1992) found ten of the twelve species of bats known to occur in north-east Victoria at this wetland during a bat survey conducted in the area in January 1992. These include:- Mormopterus planiceps (species 1 Mormopterus planiceps (species 2), Gould's Wattled Bat Chalinolobus gouldii, Chocolate Wattled Bat Chalinolobus morio, Southern Forest Bat Vespadelus regulus, Large Forest Bat Vespadelus darlingtoni, Little Forest Bat Vespadelus vulgaris, Lesser Long-eared Bat Nyctophilus geoffroyi, Western Broad-nosed Bat Scotorepens balstoni and White-striped Mastiff Bat Tadarida australis. Threatened species: This swamp has supported the Great Egret E. alba (listed under the Flora and Fauna Guarantee- DCNR 1995e). Breeding: Many species of birds utilise fringing woodland habitat at Black Swamp for breeding including: Sulphur-crested Cockatoo Cacatua galerita, Little Corella Cacatua pastinator, Galah Cacatua roseicapilla, Eastern Rosella Platycercus eximius, Yellow Rosella P. elegans, Sacred Kingfisher Halcyon sancta (all woodland/plains species), Maned Duck Chenonetta jubata, Pacific Black Duck Anas superciliosa and Grey Teal Anas gibberifrons (all waterbird species). Black Swamp has supported at least 10% of the regional populations of nine species of colonial nesting birds including the Australian White Ibis Threskiornis aethiopica, Straw-necked Ibis Threskiornis spinicollis, Yellow-billed Spoonbill Platalea flavipes, Royal Spoonbill Platalea regia (Src), Great Egret (Src), White-faced Heron Ardea novaehollandiae, Pied Cormorant Phalacrocorax varius (Src), Little Black Cormorant Phalacrocorax sulcirostris, and Rufous Night Heron Nycticorax calendonicus (Src). Other breeding species are Australasian Grebe Tachybaptus novaehollandiae, Little Pied Cormorant P. melanoleucos, Black Swan Cygnus atratus, Australian Shelduck Tadorna tadornoides, Musk Duck Bizziura lobata, Dusky Moorhen Gallinula tenebrosa, Purple Swamp Hen Porphyrio porphyrio, Eurasian Coot Fulica atra and Masked Lapwing Vanellus miles (CNR 1995).
Social and cultural values: Recreation: There is limited recreation such as birdwatching by local field naturalist groups, and duck hunting. Aboriginal culture: In a survey of the area in 1991, Victorian Archaeological Survey noted the occurrence of several scarred trees on Black Swamp (VASDATA 1992).

Land tenure :

On site: State Wildlife Reserve- State Game Reserve.

Surrounding area: Private land.

Current land use :

On site: Bird watching, grazing, duck hunting, nature conservation.

Surrounding area: Private land.

Disturbances or threats :

Current: Establishment of weeds transported by stock, water and wind, altered hydrology due to drainage and road construction, grazing, causing species structure and composition changes and soil pugging and salinisation by the influx of salt laden water from the Diddah Diddah Creek system are the main threats. The vegetation community of Black Swamp is not at present threatened but may become so if the existing pressures of grazing and saline influx continues.

Potential: Influx of nutrient rich and/or pesticide-contaminated effluent water from nearby freehold land and nutrient enrichment and accumulation of salts may also be threats.

Conservation measures taken : Black Swamp is gazetted as a State Wildlife Reserve (classified as a State Game Reserve) after LCC (1985). It is recommended that investigations into the threat of salinisation of Black Swamp should commence as soon as possible, that Black Swamp be given high priority for the preparation of an integrated management plan and follow-up actions ensuing from such a plan, and grazing should be removed from Black Swamp as soon as practicable. One species listed by JAMBA and CAMBA (Great Egret) occurs at this swamp.

Management authority and jurisdiction : Department of Conservation and Natural Resources, Wangaratta.

Compiler & date : Parks and Reserves Section, National Parks Service, Department of Conservation and Natural Resources, September 1995