

2013

**REPORT ON AN
ARCHAEOLOGICAL SURVEY OF
BUTLER TO YANCHEP
RAILWAY ALIGNMENT**

FEBRUARY 2013

JOHN B CECCHI

REPORT ON AN ARCHAEOLOGICAL SURVEY OF BUTLER TO YANCHEP RAILWAY ALIGNMENT

Report Prepared by John B. Cecchi
185 Barridale Drive, Kingsley WA 6026
Email: johnbcecchi@hotmail.com
Tel: 0409 208 866

For R. & E. O'Connor Pty Ltd
PO Box 815, Nedlands, WA 6909
Email: rocej@iinet.net.au
Tel/Fax: 08 93871415

For Public Transport Authority
Public Transport Centre
116 West Parade, Perth WA, 6001

This report is subject to the provisions of the *Australian Copyright Act (Cth) 1968*.

All co-ordinates given by this reports are MGA Zone 50, referenced to WGS 84, which approximates to GDA 94.

REPORT ON AN ARCHAEOLOGICAL SURVEY OF BUTLER TO YANCHEP RAILWAY ALIGNMENT

Contents

EXECUTIVE SUMMARY	4
1.0 INTRODUCTION	6
2.0 SURVEY AREA	6
3.0 ENVIRONMENTAL BACKGROUND.....	9
4.0 ARCHAEOLOGICAL BACKGROUND.....	10
5.0 DESKTOP RESEARCH	13
5.1 DIA SITE REGISTER RESULT	14
5.2 RELEVANT HERITAGE SURVEY REPORTS	15
6.0 METHODOLOGY	17
7.0 DEFINITION OF ARCHAEOLOGICAL TERMS.....	17
8.0 RESULTS.....	20
9.0 DISCUSSION	20
10.0 RECOMMENDATIONS.....	24
REFERENCES	25
APPENDIX A- ABORIGINAL SITE REGISTER RESULTS	29
 Figure 1. Proposed Railway Alignment and Survey Area.....	 8
Figure 2. Survey area landscape.....	22
Figure 3. Survey area landscape.....	23

REPORT ON AN ARCHAEOLOGICAL SURVEY OF BUTLER TO YANCHEP RAILWAY ALIGNMENT

EXECUTIVE SUMMARY

Public Transport Authority (PTA) is proposing to extend the current Perth to Clarkson train line to connect the suburbs between Butler and Yanchep. R. & E. O'Connor Pty Ltd was commissioned to undertake an Aboriginal archaeological survey of the train alignment. Archaeologist John Cecchi undertook the field survey to assess the presence or potential for archaeological sites within the survey area and provide suitable recommendation to address and manage Aboriginal cultural material or issues, in accordance to the relevant State and Commonwealth legislations.

Background research of the survey region's climate, vegetation, geology and archaeology was conducted prior to the field investigation. Previously reported sites located near the survey area were identified via the Department of Indigenous Affairs Site Register. Site files and relevant heritage survey reports were analysed at the DIA East Perth Site Register Office. One Registered site, three Stored Listings and one Lodged Status site are located in the survey region, outside the project's proposed disturbance zone. Several heritage surveys, both archaeological and ethnographic, have been previously commissioned in the survey region in relation to private and government developments.

The fresh water sources, lakes and rivers in the region have often been recorded as sites of ethnographic significance (O'Connor et al 1984, Bahvna 1998). Significant archaeological and paleontological sites have been recorded within limestone rockshelters and caves near the development area. Sites such as Orchestra Shell Cave, Murray's Cave and Dunstan's Quarry have yielded evidence for Aboriginal occupation of

REPORT ON AN ARCHAEOLOGICAL SURVEY OF BUTLER TO YANCHEP RAILWAY ALIGNMENT

the region in the range of 6,500 to 1,800 years BP, and fossils of the Tasmanian Devil and Tasmanian Tiger (Hallam 1974, Douglas et al 1966).

The development area was surveyed via purposive pedestrian transect aligned north south along the proposed railway route, spaced forty metres apart. The vegetation and landform encountered at times dictated the spacing and bearing of the transects. Parts of the survey area held moderate to good ground visibility, whilst other parts were largely uncondusive to the identification of Aboriginal sites.

The survey did not identify any archaeological sites of Aboriginal heritage or isolated artefacts.

As no sites or isolated artefacts were recorded within the survey area, and in view of the general low visibility afforded by the vegetation and low potential for archaeological sites, no further archaeological research is warranted. Given the potential for archaeological sites to be discovered within caves and rockshelters, should these features be encountered during the project, further archaeological research is warranted. As all sites of Aboriginal heritage are protected under the Act, whether previously registered or not, further archaeological and ethnographic consultation may be required should any archaeological material be uncovered during the project. If skeletal material is discovered during ground disturbing works, the WA Police should be contacted.

REPORT ON AN ARCHAEOLOGICAL SURVEY OF BUTLER TO YANCHEP RAILWAY ALIGNMENT

1.0 INTRODUCTION

PTA is proposing to extend the current Perth to Clarkson train line from Butler to Yanchep. R. & E. O'Connor Pty Ltd was commissioned to undertake an Aboriginal archaeological survey of the train alignment. Archaeologist John Cecchi undertook the field survey to assess the presence or potential for archaeological sites within the survey area and provide suitable recommendation to address and manage Aboriginal cultural material or issues, in accordance to the relevant State and Commonwealth legislations.

The purpose and scope of the Aboriginal Heritage Study (archaeological) is to:

- establish whether the area contains physical evidence of past Aboriginal occupation and use;
- record and make recommendations regarding the management of sites (if any), with specific reference to the proposed development;
- analyse the above information against the proposal and provide recommendations;
- collate all information required for the purpose of reporting any unregistered sites (if any) to the Aboriginal Site Register (if applicable).

2.0 SURVEY AREA

The proposed northern railway alignment will connect the existing Clarkson station to the suburbs of Butler and Yanchep, with approximately thirteen kilometres of new rail (Figure 1). The project area is located approximately forty to fifty-three kilometres north of Perth's CBD. The railway alignment travels through an area bounded by

REPORT ON AN ARCHAEOLOGICAL SURVEY OF BUTLER TO YANCHEP RAILWAY ALIGNMENT

Wanneroo Road to the north and Marmion Avenue to the south. The project area is situated between two and three kilometres east of the coastline.

REPORT ON AN ARCHAEOLOGICAL SURVEY OF BUTLER TO YANCHEP RAILWAY ALIGNMENT

3.0 ENVIRONMENTAL BACKGROUND

The study area is subject to a warm Mediterranean climate characterised by dry summer and a wet winter. Median temperatures range from 32°C in late summer to 8°C in late winter (Strawbridge 1988; 9).

The Perth regional landscape consists of intermittent sections of sandy soils that exhibit poor water retention and internal draining. Around the Wanneroo area the soils consist of deep, free-draining sands over limestone, whilst the Swan River drainage basin comprises fertile alluvial soils, further east becoming coastal sands grading to deep reddish sandy loams, fringed by grey-brown sands overlaying clays, and meeting the scarps gravelly sands and adjacent poorly drained soils (Beeston 1999).

The project area encompasses Spearwood and Quindalup Dune Systems. The Spearwood Dune System comprises aeolianate limestone overlain by variable depths of leached soils, yellow to brown in colour, with occasional exposures of limestone. The Quindalup Dune System is younger, dating to the Holocene Period, consisting of recently deposited calcareous sands, with some cementing of lower layers.

The sediments of these two systems are conducive to the creation of karst caves as evidenced by several recorded caves in the region including Melaleuca Cave, Yanchep Cave, Crystal Cave, Rose Cave, Road Cave and Cauliflower Cave within Yanchep National Park. Further east places such as Orchestra Shell Cave and Murray's Cave have yielded evidence for prehistoric Aboriginal occupation, and fossils of the Tasmanian Devil and Tasmanian Tiger.

REPORT ON AN ARCHAEOLOGICAL SURVEY OF BUTLER TO YANCHEP RAILWAY ALIGNMENT

The survey area is located within the Drummond Subdistrict of the Darling Botanical Province that is predominantly characteristic of the Spearwood Dune System.

Vegetation associations include:

- Tuart Forest (*Eucalyptus gomphocephala*), occasionally mixed with marri and jarrah. Lower storey comprising *Banksia attenuata*, *B. menziesii*, *B. grandis* and *Allocasuarina fraseriana* (sheoak). The understorey is characterised by *Xanthorrhoea preissii* and *Macrozamia riedlei* and a shrub layer formed by a variety of species. This association dominates area where soils are shallow and where limestone is close to the surface. Jarrah forest dominates in deeper soils.
- Banksia Low Woodland consisting of various *Banksia* species and Eucalypts and *Allocasuarina* occur on deeper soils. Limestone ridges are characterised by *Dryandra Heath* (parrot bush) and bottlebrush, with some *Acacia* and *Malaleuca* low scrub within the Quindalup soils (Beard 1981).

4.0 ARCHAEOLOGICAL BACKGROUND

Aboriginal people have occupied the South West of Western Australia for at least 38,000 years BP (Pearce and Barbetti 1981). Other Pleistocene to Holocene dates have been obtained from sites including Minmin Cave (Clarke & Dortch 1977), Devil's Lair (Dortch 1979) and Walyuga (Pearce 1978). Sites excavated closer to the survey area have yielded late Holocene dates and they include Boddington (3,230 years BP), Collie (5,810 years BP) and North Dandalup (1,280 years BP) (Veth 1987).

Significant archaeological and paleontological sites have been recorded within limestone rockshelters and caves east of the survey area. Sites such as Orchestra Shell

REPORT ON AN ARCHAEOLOGICAL SURVEY OF BUTLER TO YANCHEP RAILWAY ALIGNMENT

Cave, Murray's Cave and Dunstan's Quarry have yielded evidence for Aboriginal occupation of the region in the range of 6,500 to 1,800 years BP, together with possible Aboriginal rock engravings, and fossils of the Tasmanian Devil and Tasmanian Tiger (Hallam 1974, Douglas et al 1966).

Regional studies generalising the nature and occurrence of Aboriginal sites within the Perth region have concluded that the majority of archaeological sites are located around the lakes and swamps of the coastal sand plain, and that fewer sites are located within coastal dunes, and on sand hills around lakes on the eastern margin of the Spearwood Dunes (Hallam 1986). Other research has resulted in similar findings (Anderson 1984). Higher site distribution and density around fresh water lakes and swamp systems has been associated with an abundance of resources present within these ecological zones (Strawbridge 1988).

Archaeological studies in the Perth metropolitan area have indicated that although the Bassendean Sands contain resource rich systems and exhibit a high density of archaeological sites, the soils have a negligible potential to yield stratified deposits, for both natural and cultural reasons (including European disturbance) (Bowdler, Strawbridge and Schwede 1991).

Hallam's research aimed to develop a chronology for archaeological sites based on assemblage characteristics. She proposed a four-phase system, the oldest of which is the Early Phase. This corresponds to a period greater than 5,000 to 6,000 years ago and is characterised by assemblages comprising bryozoan chert artefacts and a high percentage of steep edged scrapers (Hallam 1986). The inference that sites containing fossiliferous chert are older than 5,000 years is based on the assumption that the source

REPORT ON AN ARCHAEOLOGICAL SURVEY OF BUTLER TO YANCHEP RAILWAY ALIGNMENT

of this particular type of bryozoan chert has only been identified sixty kilometres west of Mandurah, and therefore, could only have been sourced prior to the sea rising to its present level 5,000 to 6,000 years ago (Strawbridge 1988).

The Middle Phase encompasses a time period after 5,000 years ago with temporal markers identified in assemblages including backed blades, flat adzes and mylonite. Characteristics in artefact assemblages related to the Late Phase, were said to be characterised by numerous quartz rich scatters, exhibiting a high number of chips. The Late Phase consists of sites exhibiting flaked glass and ceramic, indicating a post-contact period manufacture.

Although potentially useful, inconsistencies with this chronology have been raised (Strawbridge 1988, Anderson 1984).

Anderson (1984) formulated a predictive model based on ethnographic knowledge and archaeological evidence of recorded sites within the Swan Coastal Plain, the Darling Scarp and the Ranges that proposes a seasonal movement of Aboriginal groups between the plateau and plain. The large sites within the Bassendean system are seen to result from large scale, repeated visits to localities of high economic resources, during the summer and autumn months, such as the coast, estuaries and inland water bodies. During winter and early spring, as resources became less abundant, some of the Aboriginal groups on the Plain would have exploited various resources in the Darling Ranges, whilst the remainder may have increased their range over the Plain. Anderson (1984) also postulated direct movement of Aboriginal people of the Plain to the Darling Ranges for ceremonial, trade and social purposes.

REPORT ON AN ARCHAEOLOGICAL SURVEY OF BUTLER TO YANCHEP RAILWAY ALIGNMENT

Strawbridge (1987) collated information from Hallam's study to propose a model for Perth Metropolitan site patterning. The study concluded that sites are likely to be located on sandy, well drained dune ridges; within 350 metres of a potential water source such as creeks, rivers, lakes, swamps and springs; and are unlikely to be located in low-lying, poorly drained, or seasonally inundated areas and further than 350 metres from a water source. The site patterning exhibited a higher percentage of sites within the Bassendean Sand geomorphologic unit, with a very small number of sites within the Quindalup Dune System.

Whilst formulating a predictive model for site patterning from previous research is possible, it must be noted that site identification is related to ground visibility. The majority of archaeological sites within the Perth region have been discovered in areas of good ground visibility and commonly only during or after ground disturbing works (i.e. Edwards & Murphy 1999).

5.0 DESKTOP RESEARCH

Research of the DIA Aboriginal Site Register for the area bounded by the following polygon co-ordinates was undertaken to analyse and study previously recorded sites within or near the survey area, and relevant heritage survey reports:

6511270 mN 371483 mE, 6508299mN 372276 mE, 6507876 mN 373522 mE, 6506507 mN 374154mE, 6504681mN 374481mE, 6503117mN 376142mE, 6499333mN 376949mE, 6499205 mN 376289mE, 6503025mN 375287mE, 6504740mN 373641mE, 6507313mN 373108mE, 6508307mN 371334mE, 6511221mN 370773mE.

REPORT ON AN ARCHAEOLOGICAL SURVEY OF BUTLER TO YANCHEP RAILWAY ALIGNMENT

The search identified five sites relevant to the project area and fifteen heritage survey reports. For a printout of the Aboriginal Site Register Results view Appendix A. The site files for each of these listing were reviewed at the DIA Site Register Office in East Perth.

5.1 DIA SITE REGISTER RESULT

Site 20772 'Jindalee' is Registered Status site placed under Closed Access and described as of mythological significance. The location and site file for this site were not available for viewing given its Access status. The site is also described as a natural feature and water source. This site is located to the south-west and out of the survey area.

Site 20600 'Butler - Fs04' is a Lodged Status Listings placed under Open Access and centred upon GPS co-ordinates 377031mE 6499413mN. The co-ordinates are listed as 'Unreliable'. This site refers to a stand of old tuart trees reported in the Parker (2003) report. One of the elders stated that the stand of tuart trees should be preserved if possible. A site visit to the given GPS Co-ordinates indicated that at least part of this listings remains within a local park. This listing is located outside the proposed project area.

Site 20766 'Sbj05' is a Stored Status Listing and is therefore not covered by the Act. The listing was located at 376202mE 6499320mN and reported as a natural feature and limestone ridge. The site was reported by AIC (2008).

Site 20769 'Sbj09' is a Stored Status Listing and is therefore not covered by the Act. The listing was located at 376693mE 6499728mN and reported as tall Eucalypt trees. The site was reported by AIC (2008).

REPORT ON AN ARCHAEOLOGICAL SURVEY OF BUTLER TO YANCHEP RAILWAY ALIGNMENT

Site 20770 'Sbj10' is a Stored Status Listing and is therefore not covered by the Act. The listing was located at 376790mE 6499388mN and reported as old eucalypt trees. The site was reported by AIC (2008).

5.2 RELEVANT HERITAGE SURVEY REPORTS

The DIA Site Register search engine deemed fifteen Heritage Survey Reports relevant to the survey area. It is noted that reports are deemed relevant even if sites are mentioned, without necessarily giving further information or research on a particular site. The following reports were analysed with information relevant to the survey:

AIC 2010, Archaeological and Ethnographic Site Identification Survey of the Proposed Brighton Beachside Development at Jindalee, Western Australia. DIA Report ID 28476.

AIC was commissioned to survey an area at Jindalee that was earmarked for housing estate development. The archaeological survey was undertaken via east west aligned pedestrian transects spaced ten to twenty metres apart. The report states that the area was vegetated by banksias, wattles and grass trees allowing for less than 10% ground visibility. No archaeological material was located and the results were attributed to low ground visibility and the heavily disturbed machine tracking in cleared areas.

REPORT ON AN ARCHAEOLOGICAL SURVEY OF BUTLER TO YANCHEP RAILWAY ALIGNMENT

Thomson, J. 2011, Report on an Indigenous Archaeological Survey: Lot 609 Yanchep Beach Road, Yanchep, Western Australia. DIA Report Id 28813.

Lot 609 on Yanchep Beach Road was surveyed for archaeological sites by east west aligned transects spaced thirty metres apart. No sites or isolate artefacts were recorded. The report states that the results are consistent with other heritage surveys undertaken in the Yanchep region, in that no archaeological sites were located.

Although dense coastal vegetation was stated to limit ground visibility and the potential for site identification, the report concurs with previous research of Aboriginal site patterning that view the Quindalup and western Spearwood Dune Systems as ephemeral areas of Aboriginal occupation. The small percentage of archaeological material recorded within these geomorphic units is seen to reflect a pattern of past land use that did not involve purposeful activities within the littoral or near coastal areas, but rather focused on the lakes and swamps of the coastal plain, riverine alluvial plain and scarp foothills.

Other reports undertaken within the survey region and not included in the Aboriginal Site Register include Quartermaine, Harris et al 1991. This study was commissioned as a response to the Draft North-West Corridor Plan and covered a sample area of sixteen square kilometres of land between Yanchep and Two Rocks. Pedestrian transects were undertaken spaced thirty metres apart and resulted in one archaeological site, namely DIA artefact scatter Site ID 3394 to be recorded.

REPORT ON AN ARCHAEOLOGICAL SURVEY OF BUTLER TO YANCHEP RAILWAY ALIGNMENT

6.0 METHODOLOGY

The Butler to Yanchep rail extension was inspected via purposive pedestrian transects aligned north south along the proposed route. Transects were spaced forty metres apart, or as allowed by the vegetation. Zones that held good ground visibility such as tracks and land clear of vegetation were investigated by purposive pedestrian transect.

The field survey was undertaken with the assistance of a Garmin GPS Map 76CSx, employing GDA 94 and referenced to MGA Zone 50, accurate to ten metres. The survey was also aided by small and large-scale maps and aerial and cadastral maps of the survey area.

7.0 DEFINITION OF ARCHAEOLOGICAL TERMS

Scarred Trees

Aboriginal scarred trees reflect several traditional activities involving the removal of bark and wood. A significant amount of Aboriginal cultural material was sourced from the bark and wood of trees to make implements such as shields, sacred boards, shelters and containers. Other scars have been recorded as toe holds made in order to climb trees, or holes within trunks used to smoke out and hunt mammals (Long 2005). Aboriginal scars occur on a variety of tree types and given the variety of purposes for which they were used, appear in a diverse range of sizes and shapes.

REPORT ON AN ARCHAEOLOGICAL SURVEY OF BUTLER TO YANCHEP RAILWAY ALIGNMENT

Scars on trees formed after the piece of bark or wood is extracted and damage to the cambium results in a drying out of the sapwood, where bark will not be able to grow back again. Overgrowth of bark surrounding the scar may occur and to such an extent to eventually close or apparently seal the wound, although this new growth will never join with the dry face underneath.

A scar on a tree can also derive from other injuries the bark receives, for example via lightning strike, fire damage, collapse of branches or other trees onto trunk, vehicle collision, surveyors marks, ring barking and faunal damage. Given these considerations, it is sometimes difficult to accurately identify a scarred tree as of Aboriginal, European or natural origin.

Long (2005) provides the following guidelines to assess the whether a scar on a tree is from natural or incidental types of scarring:

- What impacts have occurred in the vicinity of the scar?
- How old is the tree on which the scar occurs, and how long has the scar been there?
- What impacts have occurred to the tree, and can you work out the order in which they have occurred?
- Can you identify the form and size of the original scar on the tree?

An epicormic shoot or stem will be located immediately below a section of damaged trunk which interrupts the connection between the roots and the canopy and is a common feature associated with cultural scars (Long 2005).

REPORT ON AN ARCHAEOLOGICAL SURVEY OF BUTLER TO YANCHEP RAILWAY ALIGNMENT

If the scar occurs on a dead tree, an arborist could perhaps indicate when the tree died, how old the tree was at the time of death and provide an estimate of the time between scarification and death of the tree. This information would provide a possible time span for the production of the scar on the tree. C-14 dating and growth ring counting can provide accurate dates for the age of the tree.

A **Quarry** may occur wherever outcrops of suitable stone are found. These exhibit a concentration of primary flakes in the artefact assemblage with a relative dense concentration, and may contain the original quarried stone exhibiting hundreds of flake scars.

Because rocks and minerals can fracture as a result of geomorphic or other natural processes flaked stones are classified as **stone artefacts** if they exhibit one or more of the following features (Holdaway & Stern 2004: 108-9):

A positive or negative ring crack

A negative or positive bulb of percussion

An érraillure scar below the point of percussion

Negative flake scars or ridges

Flakes, Cores and Retouched flakes (Tools), are the three main categories of artefacts and their features are detailed below (Hiscock 1984: 129):

REPORT ON AN ARCHAEOLOGICAL SURVEY OF BUTLER TO YANCHEP RAILWAY ALIGNMENT

Flakes must exhibit at least one of the following traits:

A ring crack

A positive bulb of percussion

An érraillure scar below the point of percussion

Cores exhibit negative flake scars marking the place where previous flakes were struck.

A core may be described as Unidirectional, Bidirectional, Bifacial or Multidirectional depending on the orientation of the flake scars and location of the striking platform (Holdaway & Stern 2004:180-2).

Retouched Flakes, also classified as Tools, are stones that show signs of flake scars across their ventral surface and display a ring crack.

8.0 RESULTS

No sites of Aboriginal archaeological heritage or isolated artefacts were located within the survey area.

9.0 DISCUSSION

In areas within the project area where skeletal soils overly limestone, favouring the growth of very dense shrubs, sedges and bushes, the bearing and alignment of the north south pedestrian transects was considerably affected. These densely vegetated areas allowed for negligible ground visibility and were largely uncondusive to the discovery

REPORT ON AN ARCHAEOLOGICAL SURVEY OF BUTLER TO YANCHEP RAILWAY ALIGNMENT

of Aboriginal heritage sites. Site types such as artefact scatters, which are a common archaeological site type in the Perth Metropolitan region, may only be identifiable in areas of moderate to good ground visibility and during, or after, works in areas of high vegetation cover. Ridge crests usually held better ground visibility and were surveyed intensively.

Site types such as scarred trees have a moderate potential to be discovered within the survey area, as trunks of trees tended to be free from understory vegetation and any scarring potentially visible from several metres away. As tree trunks were investigated during the course of the survey, no Aboriginal scarred trees were identified.

No rockshelters or caves were encountered within the survey area, although these features can sometimes be difficult to detect given the very dense vegetation that may occur around these landforms.

REPORT ON AN ARCHAEOLOGICAL SURVEY OF BUTLER TO YANCHEP RAILWAY ALIGNMENT



Figure 2. Survey area landscape.

REPORT ON AN ARCHAEOLOGICAL SURVEY OF BUTLER TO YANCHEP RAILWAY ALIGNMENT



Figure 3. Survey area landscape.

As the field survey did not record any areas of Aboriginal heritage and the survey area was assessed as largely uncondusive towards the identification of sites, and with a low potential for archaeological sites, no further archaeological research is warranted.

REPORT ON AN ARCHAEOLOGICAL SURVEY OF BUTLER TO YANCHEP RAILWAY ALIGNMENT

10.0 RECOMMENDATIONS

- The archaeological survey did not identify any cultural material or sites of Aboriginal heritage.
- Should any limestone caves or shelters be discovered during the project, these features warrant further archaeological investigation.
- All sites of Aboriginal heritage are protected under the Act, whether previously registered or not. Further archaeological and ethnographic consultation may be required should any archaeological material be uncovered during the project.
- Should skeletal remains be uncovered during earth works, all works in the area should cease and the WA Police should be contacted.

REPORT ON AN ARCHAEOLOGICAL SURVEY OF BUTLER TO YANCHEP RAILWAY ALIGNMENT

REFERENCES

Anderson, J. 1984, *Between Plateau and Plain: Flexible Responses to Varied Environments in Southwestern Australia*, Occasional Papers in Prehistory 4, Research School of Pacific Studies, Australian National University, Canberra.

Beard, J. 1981, *Swan: Vegetation Survey of Western Australia*. University of Western Australia.

Beeston, J. 1999, *The Wine Regions of Australia*, Allen & Unwin, Australia.

Bowdler, S., Strawbridge, L., Schwede, M. 1991, "Archaeological Mitigation in the Perth Metropolitan Region", *Australian Archaeology*, vol.32, 1991.

Clark, J. and Dortch, C. E. 1977, "A 10,000 year b.p. radiocarbon date for archaeological finds within a soil of the Spearwood Dune System, Mosman Park, W.A." *Search* 8, 36-38.

Dortch, C. 1979, "Devil's Lair, an example of prolonged cave use in south-western Australia" *World Archaeology* 10, 258-279.

Douglas, A., Kendrick, G. and Merrilees, D. 1966 "A Fossil bone deposit near Perth, W.A.", in *Journal of the Royal Society of W.A.*, Vol. 49, pp. 88-90.

101370. Bhavna, L. 1998, *Cultural significance of Aboriginal sites in the Wanneroo area : Final report prepared for Elder H.*

REPORT ON AN ARCHAEOLOGICAL SURVEY OF BUTLER TO YANCHEP RAILWAY ALIGNMENT

Edwards, K., Murphy A. 1999, Report on Monitoring Activities and Preliminary Investigations. Graham Farmer Freeway (Stage 2). DIA Report Id 104741.

Hallam, S.J. 1986, Prehistoric Aboriginal populations on the Swan Coastal Plain, Western Australia. Final report on the project: Australian Research Grants Scheme.

Hallam, S.J. 1974 "Excavations at the Orchestra Shell Cave, Wanneroo, Western Australia". *Archaeology and Physical Anthropology in Oceania*, 9: 66 - 84

Hallam, S.J. 1971, "Roof Markings in the 'Orchestra Shell' Cave, Wanneroo, near Perth, WA", in *Mankind* 8:2, 1971 December, pg 90-103.

Hiscock, P. 1984, "A preliminary report on the stone artefacts from Colless Creek Cave, Northwest Queensland". *Queensland Archaeological Research*, 1:120-151.

Holdaway, S. & Stern, N. 2004, *A Record in Stone: The Study of Australia's Flaked Stone Artefacts*, Museum Victoria, Melbourne.

Irish, P. 2004, "When is a scar a scar? Evaluating Scarred and Marked Trees at Sydney Olympic Park", in *Australian Archaeology*, No. 59.

REPORT ON AN ARCHAEOLOGICAL SURVEY OF BUTLER TO YANCHEP RAILWAY ALIGNMENT

Long, A. 2005, Aboriginal Scarred Trees in New South Wales: A Field Manual. Department of Environment and conservation, NSW.

McDonald, Hales and Associates, 2000, Report on Archaeological Excavations. Riversdale Road Site (GFFA-I/AAD Site Id 16718), Rivervale, Western Australia. DIA Report Id 105184.

Murphy, A. 1999, Interim Report on Mitigative Investigations. Graham Farmer Freeway (Stage 2) Artefact Scatter, Riversdale Road, Belmont. DIA Report Id 104265.

Murphy, A. 1989, Report of an archaeological and ethnographic survey for Aboriginal sites Neerabup Wanneroo. DIA Report Id 104314.

O'Connor, R., C. Bodney, Little L. 1984, Report on the Survey for Aboriginal Areas of Significance in the Perth Metropolitan and Murray River Regions. Prepared for Australian Heritage Commission.

Parker, S. 2003, Ethnographic and archaeological site avoidance survey under the Aboriginal Heritage Act (1972) proposed residential development of The Brighton Estate Lot 8 Marmion Avenue Butler Western Australia'

Pearce, R. H. 1978, "Changes in artefact assemblages during the last 8,000 years at Walyunga, Western Australia", Journal of the Royal Society of W.A. 61, 1-10.

REPORT ON AN ARCHAEOLOGICAL SURVEY OF BUTLER TO YANCHEP RAILWAY ALIGNMENT

Pearce R., and Barbetti M. 1981, "A 38000 Year old site at Upper Swan, Western Australia". *Archaeology in Oceania* 16: 173-178.

Quartermaine, G, Harris, J. et al 1991, Yanchep Structure Plan: Report on an Archaeological Survey for Aboriginal Sites. Response to Draft North-West Corridor Structure Plan Department of Planning and Urban Development.

Schwede, M.L. 1983, An Archaeological Investigation of the Helena River Site.
Report to M.R.D., Perth.

Strawbridge, L. 1988, Aboriginal Sites in the Perth Metropolitan Area: A Management Scheme. Prepared for the Centre for Prehistory, U.W.A.

**REPORT ON AN ARCHAEOLOGICAL SURVEY OF BUTLER TO
YANCHEP RAILWAY ALIGNMENT**

APPENDIX A- ABORIGINAL SITE REGISTER RESULTS



Search Criteria

5 sites in a search polygon. The polygon is formed by these points (in order):

MGA Zone 50	
Northing	Easting
6511270	371483
6508299	372276
6507876	373522
6506507	374154
6504681	374481
6503117	376142
6499333	376949
6499205	376289
6503025	375287
6504740	373641
6507313	373108
6508307	371334
6511221	370773



Disclaimer

Aboriginal sites exist that are not recorded on the Register of Aboriginal Sites, and some registered sites may no longer exist. Consultation with Aboriginal communities is on-going to identify additional sites. The AHA protects all Aboriginal sites in Western Australia whether or not they are registered.

Copyright

Copyright in the information contained herein is and shall remain the property of the State of Western Australia. All rights reserved. This includes, but is not limited to, information from the Register of Aboriginal Sites established and maintained under the Aboriginal Heritage Act 1972 (AHA).

Legend

Restriction	Access	Coordinate Accuracy
N No restriction	C Closed	Accuracy is shown as a code in brackets following the site coordinates.
M Male access only	O Open	[Reliable] The spatial information recorded in the site file is deemed to be reliable, due to methods of capture.
F Female access	V Vulnerable	[Unreliable] The spatial information recorded in the site file is deemed to be unreliable due to errors of spatial data capture and/or quality of spatial information reported.

Status

L - Lodged	ACMC Decision Made
Information lodged, awaiting assessment	R - Registered Site I - Insufficient information S - Stored Data

Spatial Accuracy

Index coordinates are indicative locations and may not necessarily represent the centre of sites, especially for sites with an access code "closed" or "vulnerable". Map coordinates (Lat/Long) and (Easting/Northing) are based on the GDA 94 datum. The Easting / Northing map grid can be across one or more zones. The zone is indicated for each Easting on the map, i.e. '5000000:Z50' means Easting=5000000, Zone=50.

Sites Shown on Maps

Site boundaries may not appear on maps at low zoom levels



List of 1 Registered Aboriginal Sites with Map

Site ID	Status	Access	Restriction	Site Name	Site Type	Additional Info	Informants	Coordinates	Site No.
20772	R	C	N	Jindalee	Mythological	Natural Feature, Water Source	*Registered Informant names available from DIA.	Not available for closed sites	



Aboriginal Heritage Inquiry System

Aboriginal Sites Database





List of 4 Other Heritage Places with Map

Site ID	Status	Access	Restriction	Site Name	Site Type	Additional Info	Informants	Coordinates	Site No.
20600	L	O	N	Butler - Fs04		[Other: Old Tuarts]	*Registered Informant names available from DIA.	377031mE 6499413mN Zone 50 [Unreliable]	
20766	S	O	N	Sbj05		Natural Feature, [Other: Limestone ridge]	*Registered Informant names available from DIA.	376202mE 6499320mN Zone 50 [Reliable]	
20769	S	O	N	Sbj09		Natural Feature, [Other: Tall Eucalyptus Trees]	*Registered Informant names available from DIA.	376693mE 6499728mN Zone 50 [Reliable]	
20770	S	O	N	Sbj10		Natural Feature, [Other: Old eucalyptus tree]	*Registered Informant names available from DIA.	376790mE 6499388mN Zone 50 [Reliable]	



Aboriginal Heritage Inquiry System

Aboriginal Sites Database





Map Showing Registered Aboriginal Sites and Other Heritage Places



Aboriginal Heritage Inquiry System

Aboriginal Sites Database





Search Criteria

15 survey reports with information on the sites in a search polygon. The polygon is formed by these points (in order):

MGA Zone 50	
Northing	Easting
6511270	371483
6508299	372276
6507876	373522
6506507	374154
6504681	374481
6503117	376142
6499333	376949
6499205	376289
6503025	375287
6504740	373641
6507313	373108
6508307	371334
6511221	370773

Disclaimer

Reports shown may not be held at DIA. Please consult report holder for more information. Refer to www.dia.wa.gov.au/heritage for information on requesting reports held by DIA.

Copyright

Copyright in the information contained herein is and shall remain the property of the State of Western Australia. All rights reserved. This includes, but is not limited to, information from the Register of Aboriginal Sites established and maintained under the Aboriginal Heritage Act 1972 (AHA).

Legend

Access

Some reports are restricted. The type of restriction is shown as a code in brackets following the catalogue number. No code indicates an unrestricted report.

[CLOSED]	Closed
[OWE]	Open with exception
[TBD]	To be determined
[RESTRICTED PENDING]	Restricted pending



Aboriginal Heritage Inquiry System

Survey Report Catalogue

Report ID	Catalogue Number	Title	Author	Old Ref No.
23254	HSR MW 2008 THO	A report on an archaeological inspection : Lot 3 Romeo Road, Alkimos, WA	Thomson, Jo	3253 08
28476	HSR MW 2010 AUS	Archaeological and Ethnographic Site Identification Survey Report of the Proposed Brighton Beachside Development at Jindalee, Western Australia	Australian Interaction Consultants	4214 10
20246	HSR MW 2003 PAR	Ethnographic and archaeological site avoidance survey under the Aboriginal Heritage Act (1972) proposed residential development of The Brighton Estate Lot 8 Marmion Avenue Butler Western Australia	Parker, Susan	1410 03
23086	HSR MW 2006 AUS	Report of a desktop study : preliminary investigation of Aboriginal Heritage for the Proposed Residential Development at Lot 3 Romeo Road Alkimos Western Australia	Australian Interaction Consultants	3205/08
23827	HSR MW 2008 MCD [CLOSED]	Report of an Ethnographic Survey of Aboriginal Heritage Values on Lot 10, Jindalee, Western Australia	McDonald Edward	3700 09
23256	HSR MW 2008 COL	Report of an ethnographic survey of Lot 3 Romeo Road, Alkimos, Western Australia	Coldrick, Bryn	3254 08
28411	HSR MW 2007 AUS	Report on Aboriginal Heritage Lots 8, 9, & 32 Butler, Western Australia	Australian Interaction Consultants	4155 10
22599	HSR MW 2007 AUS	Report on an Aboriginal Heritage Investigation under the Aboriginal Heritage Act 1972 to support a public submission on the draft East Wanneroo Land Use and Water Management Strategy	Australian Interaction Consultants	2815 07
28813	HSR MW 2011 THO	Report on an Indigenous Archaeological Survey : Lot 609 Yanchep Beach Road, Yanchep, Western Australia	Thomson, Jo-Anne	4559 11
104278	HSR MW 1990 OCO	Report on the survey for Aboriginal sites lot 10, Marmion Avenue, north west corridor	O'Connor, R	90 064
22942	HSR MW 2008 AUS	Section 18 report of a proposed residential development at Lot 8 Marmion Ave, Butler, Western Australian.	Australian Interaction Consultants	3095/08
106995	HSR MW 2003 PAR	Site avoidance survey under the Aboriginal Heritage Act (1972) of proposed land development on Lots 32, 33, & pt. 11 Connolly Drive at the Perth suburb of Butler, Western Australia	Parker, Susan	1313 03
21909	HSR MW 2005 EST	Study of groundwater - related Aboriginal Cultural Values on the Gnangara Mound, Western Australia	McDonald Edward	2356 05
21910	HSR MW 2005 EST	Study of groundwater - related Aboriginal Cultural Values on the Gnangara Mound, Western Australia : Volume 1 restricted report	McDonald Edward	2357 05
21911	HSR MW 2005 EST	Study of groundwater - related Aboriginal Cultural Values on the Gnangara Mound, Western Australia : Volume 2 inventory of registered sites restricted report for Department of Environment	McDonald Edward	2358 05