

Archaeological
Aboriginal Heritage
Survey of the
Bunbury Outer Ring
Road Southern
Section (Brad Goode
and Associates 2020)



**REPORT OF AN ARCHAEOLOGICAL
ABORIGINAL HERITAGE SURVEY OF
BUNBURY OUTER RING ROAD,
SOUTHERN SECTION:
GREATER BUNBURY REGION,
WESTERN AUSTRALIA**

*A report prepared for BORR Integrated Planning
Team on behalf of Main Roads Western Australia*

**By Mrs Jacqueline Harris
Consulting Archaeologist
Brad Goode & Associates Pty Ltd
C/O 79 Naturaliste Terrace
DUNSBOROUGH WA 6281
jacque234@bigpond.com**

Report submitted March 2020 to:

Dr Fionnuala Hannon
Environmental Approvals Manager
BORR IPT
PO Box 2776
CLOISTERS SQUARE WA 6850

The Registrar
Department of Planning,
Lands & Heritage
Bairds Building
Level 2, 491 Wellington Street
PERTH WA 6000



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79 Naturaliste Terrace, Dunsborough WA 6281
Phone: 0432 267 443
Email: bradnlee@westnet.com.au
www.bradgoode.com.au

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- Mrs Leah Mackie – Brad Goode & Associates Pty Ltd (Research & Mapping Assistant)

Gnaala Karla Booja WC1998/058 Native Title Claim group representatives

Archaeological Assistants:

- Mr James Khan
- Mr Joe Northover

COMPLIANCE STATEMENT

The survey and report has been undertaken under the requirements specified within the Infrastructure Sustainability Council of Australia (ISCA). The guidelines of *Australia ICOMOS Charter for Places of Cultural Significance, The Burra Charter, 2013* (Burra Charter) have also been incorporated within the document.

DISCLAIMER

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MAPPING

Datum Used: GDA 1994 MGA Zone 50. Handheld GPS Unit Garmin 60CSX (+/- 10m)

GLOSSARY OF TERMS

The Proponent – Main Roads Western Australia
The Consultant – Brad Goode & Associates Pty Ltd
ACMC – Aboriginal Cultural Material Committee
AHA – Western Australian *Aboriginal Heritage Act 1972*
BGA – Brad Goode & Associates Pty Ltd
BORR – Bunbury Outer Ring Road
BP – Before Present
CHMP – Cultural Heritage Management Plan
DPLH – Department of Planning, Lands and Heritage
GKB – Gnaala Karla Booja
IPT – Integrated Planning Team
MRWA – Main Roads Western Australia
NSHA – Noongar Standard Heritage Agreement
SLK – Straight Line Kilometre
SWALSC – South West Aboriginal Land and Sea Council
WAM – Western Australian Museum

EXECUTIVE SUMMARY

An archaeological investigation for Aboriginal heritage sites was commissioned by the Bunbury Outer Ring Road Integrated Planning Team (BORR IPT) on behalf of Main Roads Western Australia on the Bunbury Outer Ring Road South Section (BORR South),

The Southern section connects South Western Highway and Bussell Highway in Gelorup. The route extends some 14.5km generally north south extending in width from 20m to 900m and comprises 297 hectares. It commences at the junction of Centenary Road (closed) and Bussell Highway and runs in an arc, re-joining Bussell Highway between Woods Road and Calinup Road, thence extending to Capel Golf Club.

Brad Goode & Associates Pty Ltd was engaged to conduct a site identification archaeological Aboriginal heritage survey. The objectives of the investigation were to:

- establish if any archaeological sites as defined by section 5 of the *Aboriginal Heritage Act 1972* (AHA) were located in the proposed study area,
- determine the scientific significance and integrity of any such sites, and
- make recommendations for archaeological management or to provide data to support any necessary applications under section 18 of the AHA that may be required.

An online search of the site register at Aboriginal Heritage Division, Department of Planning, Lands and Heritage undertaken on 30th July 2019 determined there was one archaeological heritage place and two ethnographic heritage places that had DPLH extents that overlaid the study area (see McDonald & Turner 2020 for the details on the ethnographic places).

Place ID 18884 is an artefact scatter. The site was recorded by Meath Hammond and Stephen O'Reilly in 1995 as part of a Bunbury Bypass survey. The site was located within the slopes of a dam, some 30m SW of the junction of Hastie's and Allenville Roads. The site is described as a low density artefact scatter of one artefact/m² consisting of 14 quartz artefacts comprised of four flakes (28.6%), nine flake fragments (64.3%) and a core fragment (7.1%) on yellow sand. The artefacts were located within the walls of the pit at the southeast corner and northeast corner. The area is sparsely vegetated. These clusters were 80m apart with the extent of the site measuring 100m x 50m.

Thomas O'Reilly and Stuart Johnston (Goode & O'Reilly 2012) revisited the site some 17 years later. They located some 20 quartz artefacts within an area of scattered low bush and 80% visibility. They increased the site dimensions to 100mNS x 200mEW. One piece of quartz debris was located at the western end while a backed blade, flake and 15 pieces of quartz debris were located at the eastern end. They noted that the debris consisted of small flaked pieces and flake fragments. On the basis of the above estimates, average artefact density has been calculated at approximately 0.001 artefacts per m² across the entire site. No retouched or utilised artefacts, or grinding material have been located and the authors deemed the area to have little stratigraphic potential and consequently is of very low scientific significance.

As a result of this 2019 field survey one new archaeological site, BR1, as defined by Section 5a of the *Aboriginal Heritage Act 1972*, was located approximately 60m east of the proposed road alignment within the BORR survey area. No isolated artefacts were located. One previously recorded archaeological heritage place, DPLH ID 18884, was relocated within the survey area and would be affected by the BORR.

BR1, a modified tree, is located in a mostly cleared paddock adjacent to surrounding wetlands. The grid reference was Zone 50 375819mE 6303829mN. The scar was identified on an old dead jarrah tree, ~13m high and estimated age ~150 years old. The identified scar measurements were 54cm long x 26cm wide x 7cm deep and faced in a SSE direction. For the length of the scar there was a slight bulge in the tree. The scar commenced at 115cm above the ground. The

diameter of the tree at breast height is 95.5cm. The scarred tree fitted five DPLH criteria for a modified tree: indigenous species and mature; scar begins above ground level; parallel and symmetrical; bark regrowth regular; and scar terminations pointed. Its possible use was as a utensil or cultural marker. The archaeological significance of the tree is considered moderate as there are too few culturally modified trees remaining in the area from wholesale clearance and logging in the Bunbury region.

Place ID 18884 was re-examined in this 2019 archaeological survey. Six artefacts were observed in the eastern end only on the first visit and a week later, some 11 artefacts were observed and measured, all in the eastern sector on the yellow sandy mound adjacent to the fence line on the corner of Hastie and Allenville Roads. These artefacts included three flakes (27%), six flaked pieces (55%) and two chips (18%) all manufactured on quartz or crystal quartz. Each artefact's position was recorded within the mound that extended over an area 30mNS x 35mEW. The plans for BORR will partially impact the heritage place. The proposed road works intrude into the heritage place by up to 25m south of Hastie Road for 200m and up to 100m west of Allenville Road extension for 90m south of Hastie Road.

As a result of the archaeological survey the following recommendations are made:

BR1, a modified tree, is a culturally modified scar on an old dead jarrah tree. While the prospect of a long life is limited, there are few similar examples in the area. As it holds moderate significance and some research potential **it is recommended** that the location be avoided.

If MRWA wish to disturb **BR1** then a Section 18 application under the AHA should be submitted to DPLH seeking permission. If permission is granted, this should be conditional on further recording and/or removal of the said trunk to a nominated repository.

Place ID 18884 Bunbury Bypass Archaeological Site 1 is a highly disturbed small artefact scatter. If MRWA wish to disturb **Place ID 18884**, then a Section 18 application under the AHA should be submitted to DPLH seeking permission. Because of its present condition due to extensive disturbance, low number of artefacts observed and subsequent reduced scientific research potential, **it is recommended** that permission be granted conditional upon all ground works at this location being monitored by two Aboriginal traditional custodians and any artefacts, if present, collected, measured and reburied in a safe repository.

The removal or excavation of large quantities of sediment increases the risk of disturbing archaeological sites that may lie beneath the ground surface. As there are several high sand dunes, some wetlands and an ephemeral brook that have some potential to contain artefactual material, **it is recommended** that initial ground works at these topographic features be monitored by two Aboriginal traditional custodians and any artefacts, if present, collected, measured and reburied in a safe repository.

In other areas not subject to monitoring procedures, **it is recommended** that MRWA inform any project personnel of their obligation to report any archaeological material, should this be encountered during earthmoving, as outlined under Section 15 of the AHA.

If MRWA locate an archaeological site in the process of survey or ground excavation, **it is recommended** that work cease in the immediate area. Any skeletal material should be immediately reported to the Department of Planning, Lands and Heritage, and the Western Australian Police Service. Any artefactual material should be reported to Heritage and Culture Division, Department of Planning, Lands and Heritage.

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INTRODUCTION

PURPOSE

An archaeological investigation for Aboriginal heritage sites was commissioned by BORR IPT on behalf of Main Roads Western Australia (MRWA) on the Bunbury Outer Ring Road South (BORR South), a section of a regional road network for the Greater Bunbury area linking four major highways radiating around Bunbury.

The BORR is being developed in three sections (North, Central and South). The Central section, extending from Boyanup-Picton Road to South Western Highway in Davenport (PAR) was constructed in 2012/13. The alignment for the Northern section extends from Forrest Highway to Boyanup-Picton Road. The Southern section connects South Western Highway and Bussell Highway in Gelorup.

An Aboriginal heritage survey was conducted in 1995 by Hammond & S. O'Reilly from Eaton to Capel and included the BORR South corridor, the result of which an archaeological site, BBI ID 18884, was located. A further survey was conducted in 2012 by Goode & T. O'Reilly along BORR South alignment. Recently, in February 2019, an intensive survey was undertaken by T. O'Reilly & Johnston (O'Reilly 2019) on a section of the alignment between Jilley Road and Bussell Highway focusing on any tree with marking. This present survey focuses on additional planning alterations including entrance and exit roads, extended corridor widths in order to avoid environmental constraints that have arisen and an extended section in the northern sector to accommodate possible variations of the initial route but also including parts of the previously surveyed alignment.

The scope of work was provided in a site investigation management plan document to Brad Goode & Associates Pty Ltd by Ms Vicky Davies, Environmental Scientist, BORR IPT.

The objectives of the investigation were to:

- establish if any archaeological sites as defined by section 5 of the Aboriginal Heritage Act 1972 (AHA) were located in the proposed study area, and
- determine the scientific significance and integrity of any such sites and effects the proposal may have over these sites.

A report was required after completion of fieldwork making recommendations for archaeological management or to support any necessary applications under section 18 of the AHA that maybe required.

STUDY AREA

The study area is located in the greater city of Bunbury with Bunbury located 172km south of Perth (see Figure 1). The proposed route extends some 14.5km generally north south extending in width from 20m to 900m (see map) and comprises 296.8 hectares. BORR South commences at the junction of Centenary Road (closed) and Bussell Highway and runs in an arc, re-joining Bussell Highway between Woods Road and Calinup Road, thence extending to Capel Golf Club. The route crosses Five Mile Brook and a number of low-lying wetlands.

LOCATION

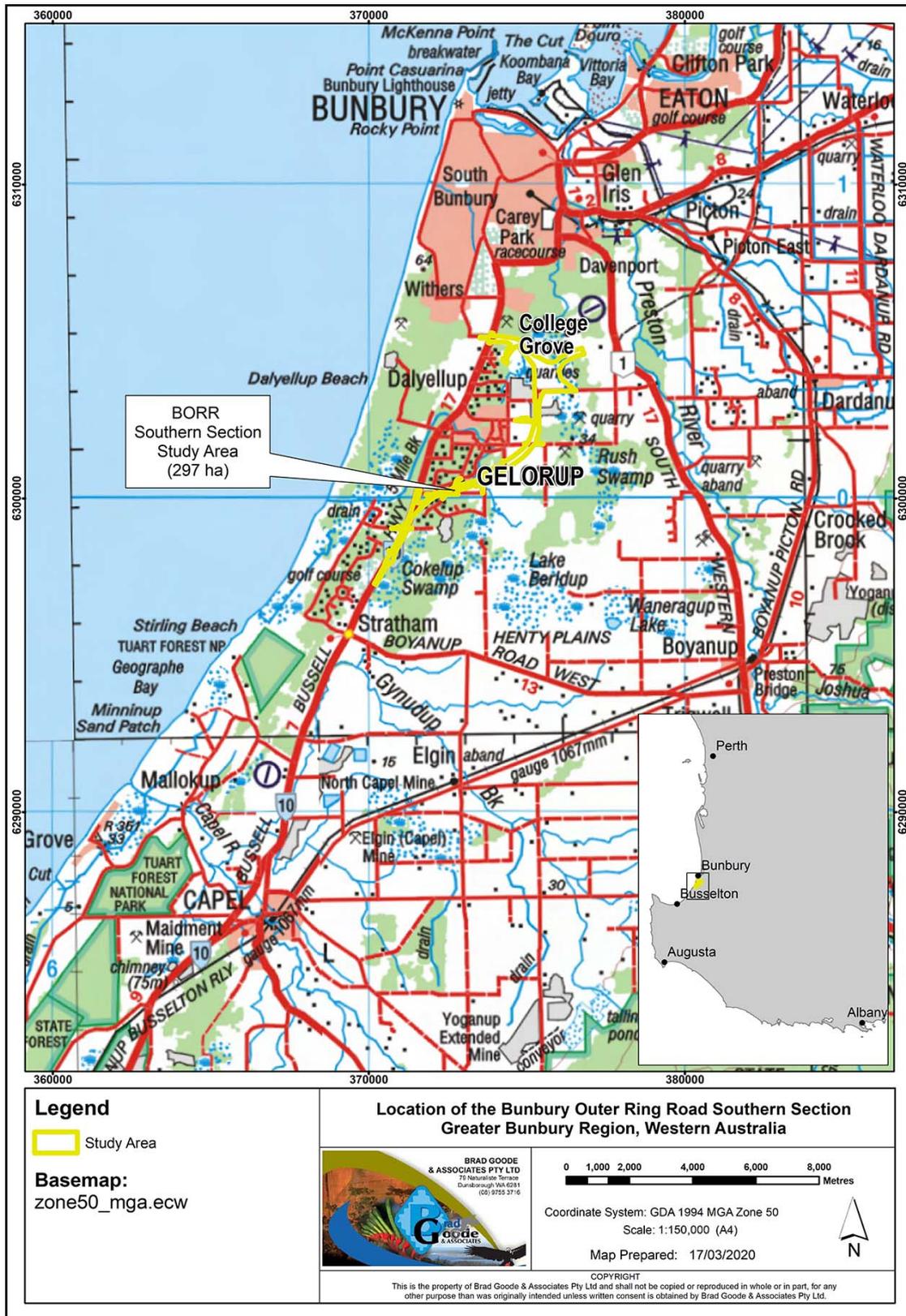


Figure 1: Location of the study area.

ENVIRONMENT

Climate

The study area lies within the south-west region of Western Australia which is characterised as a dry Mediterranean climate consisting of hot, dry summers and mild, wet winters. The mean maximum temperature in February is 30°C and mean minimum temperature in July is 7.1°C at Bunbury weather station. The region is a winter rainfall zone with annual rainfall ranges of 726 mm, most of which falls between May and September. Evaporation averages 1400mm per annum. During winter the prevailing winds are the north westerlies and westerlies associated with lows and cold front activity. In summer, the winds are from the south east and east in the morning with an afternoon sea breeze from the southwest (www.bom.gov.au, Beard 1981).

Geology and Landform

The study area lies within the Perth Basin, a deep trough filled with Phanerozoic sedimentary rocks with a surface mantle of Quaternary deposits. Geologically, all excepting the western end of the study area, is located on the Bassendean Dunes System of the Swan Coastal Plain. This system generally comprises low hills of siliceous sand interspersed with poorly drained areas (McArthur and Bettenay 1974). The surface geology can be characterised as grey alluvial sand.

The western end of the study area is located on the Spearwood Dunes System of the Swan Coastal Plain. This system, which occurs immediately to the west of the Bassendean Dunes System, generally comprises “a core of aeoloanite with a hard capping of secondary calcite overlain by variable depths of yellow or brown sand” (McArthur and Bettenay 1974:13). The surface geology within and around the western end of the study area can also be characterized as grey alluvial sand.

Vegetation

The sandy low dunes and plains were dominated by Eucalyptus / Banksia forests, in particular Eucalyptus / Agonis and Banksia woodlands / forests. The creeklines, swamps and low relief / seasonally inundated areas were dominated by *Eucalyptus rudis* / *Melaleuca preissiana* / *M. raphiophylla* woodlands. These dunes and plains were generally disturbed and the ground layer was dominated by introduced grasses and herbs. In the agricultural areas and some road reserves, native vegetation occurred as scattered remnant trees or stands over introduced grasses. The study area for the BORR Southern section includes approximately 148 ha (50%) of native vegetation (BORR IPT 2019).

BORR (2019) environmental report survey states:

The survey area contains a combination of native vegetation and highly disturbed areas, including roads, road reserve and paddocks. The condition of the survey area ranged from Excellent to Completely Degraded. Almost half of the survey areas was cleared/highly modified (49.96%). Historical clearing and aggressive weed species have influenced the remaining native vegetation. Approximately 14% of the survey area (41.98 ha) was mapped in Good or better condition and 85.91% (255.69 ha) in Degraded condition.

Integrity

The proposed corridor route intersects highways, roads, private farmland, sand mining and housing developments. There were several remnant groves of trees, one on a sandhill south of Ducane Road where Banksia spp. dominate and south of Centenary Road where mixed paperbark peppermint and eucalyptus spp. intermingle. A narrow corridor in Gelorup has been partially cleared but still retains native species such as tuart, peppermint, eucalyptus sp. on undulating low sand dunes with Five Mile Brook meandering throughout in the eastern sector. Large sections of the study area are low-lying which is seasonally waterlogged or has a high water table during winter.

ARCHAEOLOGICAL RESEARCH

DESKTOP STUDY

An online search of the site register at Aboriginal Heritage Division, Department of Planning, Lands and Heritage (DPLH), was undertaken on 30th July 2019 in order to determine if there were any archaeological Aboriginal heritage sites or heritage places that would affect the project. The search defined that there was one archaeological heritage place and two ethnographic heritage places that had extents that overlaid the study area (see Table 1).

Table 1: Summary of Archaeological and Ethnographic Aboriginal Registered Sites & Heritage Places within the study area

ID	Name	Status	Access	Restriction	Location (GDA94 Zone 50)*		Type
					mE	mN	
Other Heritage Places							
18884	Bunbury Bypass Archaeological Site 1	L	O	N	375149	6302418	Artefacts
37869	Paperbark Wetlands	L	C	Y	N/A	N/A	Modified Tree, Birth Place, Hunting Place, Water source
37870	The Gelorup Corridor	S	C	Y	N/A	N/A	Artefacts, Ceremonial Skeletal material, Burial

* Please note: Coordinates are indicative locations that represent the centre of sites as shown on maps produced by the DPLH – they may not necessarily represent the true centre of all sites.

LEGEND

R – Registered Site, I - Insufficient Information, S - Stored Data/Not a Site, L - Lodged awaiting assessment,
O – Access Open, C - Closed Access, N – File Not Restricted.

REVIEW OF HERITAGE PLACE FILES

Place ID 18884 Bunbury Bypass Archaeological Site 1

Place ID 18884 is an artefact scatter. It was recorded by Meath Hammond and Stephen O'Reilly in 1995 as part of a Bunbury Bypass survey. The site was located within the slopes of a dam, some 30m SW of the junction of Hastie's and Allenville Roads.

The site is described as a low density artefact scatter of one artefact/m² consisting of 14 quartz artefacts comprised of four flakes (28.6%), nine flake fragments (64.3%) and a core fragment (7.1%) on yellow sand. The artefacts were located within the walls of the pit at the southeast corner and northeast corner. The area is sparsely vegetated. These clusters were 80m apart with the extent of the site measuring 100m x 50m. The two groups are seen as a separation and clustering as a result of dam construction and not an internal feature of the site. The artefacts are in a disturbed state, have low research potential and low scientific significance. The ACMC has not determined the status of the artefact scatter and it is therefore defined as a lodged heritage place under the AHA.

Thomas O'Reilly and Stuart Johnston (Goode & O'Reilly 2012) revisited the site some 17 years later. They located some 20 quartz artefacts within an area of scattered low bush and 80% visibility. They increased the site dimensions to 100mNS x 200mEW. One piece of quartz debris was located at the western end while a backed blade, flake and 15 pieces of quartz debris were located at the eastern end. They noted that the debris consisted of small flaked pieces and

flake fragments. On the basis of the above estimates, average artefact density has been calculated at approximately 0.001 artefacts per m² across the entire site.

The site was interpreted as a camp site occupied on 1-2 occasions. No retouched or utilised artefacts, or grinding material have been located and the authors deemed the area to have little stratigraphic potential and consequently is of very low scientific significance.

Place ID 37869 Paperbark Wetlands

Place ID 37869 is an ethnographic female only closed site. The site informants are Annette Garlett and Tina Dann. No further information is available nor was made available to the archaeologist during the ethnographic survey with the traditional owners group. As there is no archaeological component there is no further discussion warranted.

Place ID 37870 The Gelorup Corridor

Place ID 37870 is an ethnographic male only closed site. The site informants are Terri Sharp, a European woman and Tina Dann an Aboriginal person of non Noongar descent. No further information about this site is available in this report but elaborated on in an Ethnographic Report prepared for this project. Limited information was disclosed to the archaeologist during the ethnographic survey with the traditional owners group. It is said that a wooden message stick was recovered by an undisclosed person at an unspecified time. One participant, Dennis Jetta, stated the message stick was stored in safe keeping and will be returned to the desert.

CULTURALLY MODIFIED TREES

Trees hold universality over time. They provide shade and shelter, timber for construction, fuel for cooking and heating, and fruit for food as well as having many other uses. They also provide canopy and habitat for wildlife (Wikipedia-Tree). Humans have adopted an economic dependence on trees: they provide fodder for stock; twigs for production of baskets or other tools; they are tapped for resin; stripped of bark, flowers, fruits, and nuts for fodder, food, or medicinal purposes; used for beekeeping; and shelter for domestic animals and humans (Blicharska & Mikusiński 2014). Whilst trees hold a mythological and romantic appeal, they have been cultivated, managed and ruthlessly exploited by humans since prehistory. Evidence from 7000BC shows tracts of cleared woodland to encourage a favoured species. Clay tablets from Mesopotamia around 4000BC record cultivation of orchards and grafting techniques. Throughout human history deforestation has been constant (Carey 2012).

As a result of natural, accidental or deliberate human impact, wounds that form scars develop on trees. These scars may cause damage to the living plant tissue on the trunk or limb. The damage halts any further growth in the affected section of tree forming exposed sapwood which will dry out and die after bark has been removed. The exposed sapwood will weather, crack and erode over time forming a visible scar common in forest and woodland environments. Over time these scars may be externally sealed with new growth closing over the exposed sapwood.

The Department of Indigenous Affairs (now Department of Planning, Lands and Heritage) developed criteria to assess modified trees by Aboriginal people. *'A tree, living or dead modified by the removal of bark or wood resulting in the formation of a scar for any purpose connected with the traditional cultural life of Aboriginal people past or present'* (DIA 2007). Aboriginal scarred trees are the result of deliberate removal of bark or wood from a tree. The purpose of removal could be mundane such as construction of a shelter, watercraft and container. Other reasons are deliberate markers, artefact manufacture such as shields and spear-throwers, hollowing a tree for collecting food or manufacture of footholds for tree climbing purposes.

At least three of the following points are required to establish that a scar is of Aboriginal origin:

- Scarred tree is an indigenous species and mature;
- Scar base normally begins above ground level;
- Scar is roughly parallel sided and fairly symmetrical in overall shape;
- Bark regrowth is generally regular;
- Scar terminations are squared off or pointed as a result of bark regrowth;
- Axe marks are present;
- Suspected toe holes are arranged in usable patterns.

These criteria are used to identify Aboriginal culturally modified trees throughout Australia.

To avoid a misinterpretation of the origins of scars on trees, a field manual was written by Andrew Long for Department of Environment and Conservation in N.S.W. A précis of the major points describing the factors that affect trees to form scars follows.

Features of European Scarred Trees

While Aboriginal scarred trees were a common feature of the landscape in C19th land clearance and natural tree healing processes have removed much of the evidence today. Early settlers adopted the Aboriginal use of bark, utilising it for construction and as a raw material for manufacturing e.g. tanning. These activities also removed a large number of trees from the landscape due to the destructive manner of removal as distinct from the Aboriginal method that preserved the tree. Another form of early European scarring was survey & blaze marks, small triangular or square cuts in the lower trunk, commonly found on riverbanks and road reserves.

- Historical European scars are generally limited to bark removal scars and resource extraction holes.
- European scars occur on a limited range of tree species.
- European bark removal scars are limited to rectangular panels 1-3m long.
- Large scars may be divided into two panels separated by a line of tool marks.
- European scars are usually located at the base of a tree or within 0.5m of the ground.
- Europeans used a woodsman axe or steel hatchets.
- Cross diagonal tool marks are a common feature at the top of the scar
- European scars will be less than 190 years old (one particular WA exception being Dutch explorer Dirk Hartog in 1616 who nailed a dish to a tree).

NATURAL SCARRING

The majority of tree scars display natural and incidental impacts on both old and young trees. Their characteristics may mimic the attributes of Aboriginal scarred trees in shape, size, position, age, and tool marks. These diagnostic features are:

Trauma Damage

These are common events resulting from bushfire, drought, loss of limb or crown, root exposure, specimen exposure or termite infestation. To identify natural causes where the scar is ambiguous, dead limbs or crown loss may indicate past stress. Other scars of a similar nature on trunks may indicate branch tear. Presence of branch stubs, burls or irregular growth calluses on scars would suggest the trunks unsuitable for Aboriginal use.

Storm, Lightning & Fire Damage

Lightning strikes sear the bark which either splits on impact or peels away. This process forms thin elongated scars extending down the length of the tree, often widening at the base and curving around the trunk. Dead branches and stubs protrude from the scar. Sometimes upper

limbs are affected by branch tears and splintering. The scar may develop into a large hollowed area, particularly after a fire.

Fire damage is the most common scar in woodlands and forests. Two distinct scars, a triangular scar with a wide base descending to ground level and a continuous elongated or discontinuous series of small curvilinear scars extending up the trunk, are formed by fire. These scars form on the downward side. While the dry face may be burnt, the weathering process will ensure the bark peels away after the fire revealing the unburnt surface. Dead branches or stubs may protrude from the scar. Large hollows may develop at the butt if repeatedly burnt.

To avoid mistaking a fire damaged tree for a cultural tree, an inspection is required to ensure the shape of the extant scar reflects the shape of the original scarred area of overgrowth patterns, variations in surface weathering and presence of axe marks. Another check is to see if adjacent trees have similar scarring with the same aspect. Historical records of bush fires should be checked and as well as the direction of prevailing winds.

High winds from storms may cause branch removal scars. The process leaves a keyhole or tear shaped socket at any height of tree with a prominent branch socket at the top of the scar. The internal structure of the timber is often exposed from limb loss. A fallen branch may be located on the ground. The trunk above the scar will often jut out. With small limbs the socket will be blocked but with larger cavities internal decay will result in irregular hollows.

Faunal Damage

While insect or fungal activity may be associated with natural and cultural scars, it is also a separate formation process. While these activities generally require an existing wound to gain access to underlying wood, their workings can often be submerged within the wood of the tree.

Exit holes from borers define natural scars and are rare on cultural scars. Insect activity appears as shallow tracks running across the scar. These scars are often triangular or irregular in shape but with time and overgrowth may form elongated scars. They often occur near the base and extend to ground level. Multiple scars can occur resulting in extra overgrowth lines. Grub activity may kill large parts of a tree, resulting in large amorphous scars. As grubs and borers do not infect dead wood, this is often a distinguishing sign of natural damage. Termites are less of a problem to scarring as they attack the heartwood. Some exterior effects will be hollow cavities and calluses around the margins of a scar.

Flocks of birds can cause scars. Galahs and cockatoos strip bark leaving distinctive and irregular scars but in time can resemble a cultural scar. These scars are often in the central and upper part of a tree and rarely at the base. The process is progressive with small ridges of regrowth and may be the result of smaller events. The scars are often less than 1.5m and wider than they are tall. They are irregular in shape and often curve around the trunk.

Continual use of paddocks for grazing, in particular horses and cattle, results in scarring near the base of trees. Bark can be stripped and chewed by the animals. The tree will exhibit some polishing around the circumference of the trunk. Dieback could extend the damage higher up the trunk. The scarring may ringbark the tree which will eventually kill the tree. These scars are distinguished from cultural scars by the polish and minimal weathering.

Impact and Abrasion Damage

A tree may scar from incidental or accidental impact from a moving object. For example, a tree or a branch may fall in a storm; a tree may be logged; a floating log may impact during flood conditions; earthmoving equipment may collide with a tree; and a vehicle may collide with a tree adjacent to a road.

These scars are identifiable if there is an impact mark such as crushing, splintering, tearing to the heartwood, and torn branch stubs. Many machine scars will be near tracks or roads and be at an appropriate height and orientation. In logging coupes, scars could be 3-4m above ground. It is common for limbs and trunks to fall into tree forks, leaving scars on either fork. The active impacting trunk or limb is often located adjacent to the scar. A tree stump may provide evidence of a past event. The resultant scars as they weather may resemble a cultural scar except for the non-cultural feature of a branch tear and stub.

Repeated rubbing will erode the bark and leave a scar. These can be caused by an adjacent limb, stock or cables, the latter frequently ringbarking a tree. An abraded scar may be obscured by an associated limb or trunk which has subsequently fallen since the scar's formation. The exposed surface may appear shiny. As the host trunk and adjacent limb grow the scar may exhibit surface irregularities such as subsidiary regrowth lines, smaller adjacent scars and the shape of scar may resemble the shape of an active limb.

Ring-Barking

The cutting of a circular groove or strip around the base of a trunk often kills the trunk and higher limbs. A tree can recover displaying horizontal lines of axe cuts. Three techniques used to ringbark trees are collar cut- removal of a broad strip of bark around the butt of a tree; v-cut- an unbroken round axe cut into the sapwood; and frilling- a series of downward overlapping axe cuts in the bark. To identify these trees, an examination of trees and environs is imperative as well as the length of exposure on the scar. Regenerated ring-bark scars are relatively unweathered and occur 1m above the base of a tree.

Farmland and woodland management activities may leave scars. These are generally small scars less than 0.5m long though with rope and cable, wide sections of a tree can be affected. Tool marks and cuts are often positioned on the scar face but may penetrate deeper into the sapwood. Abrasion and cut marks can be noted on cultural scars. Only a few axe cuts can damage the cambium leaving a scar.

The majority of scars in the landscape today are result of natural and incidental causes. The effects of natural tree growth and decay, land clearance and forest management have removed much of the mature trees which exhibited cultural scars in pre-contact and historical times. Younger trees now bear the impact of agricultural and forestry use, public firewood gathering and bushfires use which followed subsistence use by the Aboriginal people for a long time and European colonists for a brief period.

Identifying Aboriginal cultural scarred trees is complex and the resultant scars may be ambiguous as a result of different agents that affect a scar over time. Caution, common sense and scientific assessment should be applied when assessing tree specimens.

WOODEN ARTEFACTS

A wooden artefact was said to be located in the middle of the proposed BORR South corridor in the Gelorup section between a giant tree and some putative scar trees (Noonan 2019). The BORR IPT and proponent of the works, MRWA, were contacted in January 2019 in regard to the find but not informed as to the exact location of the specimen. BORR IPT and MRWA subsequently contacted the Aboriginal heritage consultancy firm, Brad Goode and Associates Pty Ltd, who had undertaken the recent surveys in the area. No information was provided to the Gnaala Karla Booja (GKB) Aboriginal working party group who are the nominated spokespersons appointed by South West Aboriginal Land and Sea Council (SWALSC) Aboriginal body for the area. Much of the information of the find has been obtained through public forums and newspaper articles.

It is an offence under the Western Australian AHA to remove an artefact from its location. In order to remove any artefact from an area, permission must be sought under Section 16 of the AHA. The Minister of Aboriginal Affairs, following a submission from interested parties, is obliged to rule on such an action. Because the normal legal protocols were not observed, the object is scientifically problematic to discuss as all information inherent in the artefact when removed from its context loses its significance. Any comments are reliant on hearsay several times removed and may be speculative. At the time of writing, the wooden artefact has not as yet been sighted by the author.

Renfrew & Bahn (1991, pp 43-44) state that in order to reconstruct past human activity at a site it is imperative to understand the context of an artefact. The context includes the sediment material surrounding the artefact, its provenance (horizontal & vertical) and its association with other objects. If an artefact is removed without a specialist recording the context, its value is demeaned if not lost. Removing an object destroys its primary context or in this case, its secondary context. Nature itself can also displace an object from its primary context. The formation process, how an object came to be buried and what happened after burial, serves to explain a reconstruction of past human activities. Sullivan (1983) in her treatise as to how to find and record a site reminds the reader to never interfere with a site by digging or collecting artefacts or leaving ones signature at the location as this is vandalism, illegal and destructive to the site.

Noonan (2019) has written an article that refers to the wooden artefact and describes the location as '*between a giant tree and scar trees*'. He speculated that '*the artefact had been securely hidden in the branches of or among the roots of another tree that fell over a year earlier*'. He states it was located the previous year and describes it as a ceremonial stick, carried by an Indigenous envoy from areas beyond the Goldfields to Wardandi people. He interprets the carved markings on the wooden stick as the route of the messenger's journey.

Following the finding of the wooden artefact, the specimen was said to be in the hands of an Aboriginal elder/s. Two photographs depicting one split end and the middle part of the specimen were sent to a curator at the Western Australian Museum, Ross Chadwick, who stated it was foreign to the southwest but the form, decorations and ochre traces are consistent with objects used in desert areas. Further, these are associated with ceremonial practises and non-public objects. The decoration, size and wood type conforms with an example held at the South Australian Museum from Mt Margaret Goldfields. These objects, being portable, could have been traded, gifted or sold to non-Aboriginal people. He adds that wooden artefacts exposed to the environment rarely survive.

This find is indeed remarkable as a number of heritage surveys have been undertaken previously in the area by the nominated members of the GKB in recent times and prior to this by the elders of the area accompanied by various archaeologists and anthropologists from several heritage companies (Hammond & O'Reilly 1995, Goode & O'Reilly 2012). Further, no wooden artefact has ever been located in the southwest of Western Australia. Indeed, wooden artefacts in Australia recovered from archaeological contexts are rare as a result of decomposition from high rainfall, high soil moisture content, fungi and termites (Langley 2016).

A study of Australian archaeological research journals has revealed that only some 100 wooden artefacts in total have been identified in Australia despite some 65,000 years of Aboriginal occupation (Kelly 2019). Twenty-five of these were within Wylie Swamp, South Australia, dated around 12,000 to 9,000BP, having been preserved in peat. The remaining pieces were from more recent times, 2,000 years BP to contact period. Of message sticks, Schrire (1982, p64) found one in an excavation in a dry Paribari rockshelter in Arnhem Land amid 10 other wooden objects from the top level of a midden sector. It was in association with European influences dated around mid C19th. The stick was composed of *Callitris intratropica* and was 15.7cm x 1.9cm with a flat rectangular cross section. It was pointed at one end and rounded at

the other with an incised linear design. The item was partially charred. Her informant did not translate the message but said it was used to catch lice and flies.

A digging stick dated some 200 years Before Present (BP) was found at the base of an overhang at the head of a steep gully at 970m altitude in Namadgi National Park, ACT while another in a similar location on the surface in Diamantina National Park, Queensland (Argue 2001). Some 54 wooden artefacts of slabs and pegs associated with possum and kangaroo skin processing were collected from rockshelters at Grampian Ranges, Victoria, while Kelly notes boomerangs, throwing sticks, hafted adzes, club, digging stick, and tjuringa on the surface in South West Queensland. Langley et al (2016) notes most of the artefacts are weapons and derived from hardwoods.

The only wooden specimen that has been recovered in Western Australia is a small worked fragment of a boomerang at Riwi Cave in Kimberley on the edge of Great Sandy Desert. It was within an excavation from the cave and dated around 600BP years (Langley et al. 2016).

REVIEW OF HERITAGE SURVEY REPORTS

Murphy, A, McDonald, E, & Locke, R.G. 1990, *Report of an Archaeological and Ethnographic Survey for Aboriginal Sites Bussell Highway, Bunbury*, A report prepared for Main Roads Bunbury WA

This survey concerned an area 100m wide of road construction along the easement of the proposed dual carriageway on part of the Bussell Highway on the western side of the road between Centenary Road and Capel Golf Club and thence on the eastern side to Boyanup Road West. No surface water crosses the area excepting the artificial drain of Five Mile Brook. Research on the archaeology of Bunbury revealed that 23 artefact scatters had been located within a 10km radius of Bunbury and only eight were located outside Bunbury but none in the 1990 study area.

The open scatters consisted of quartz/quartzite flakes, chips and cores in low densities of up to 20 artefacts occurring within discrete groups but when combined formed larger complexes suggesting intensive Aboriginal use. No site was more than 500m away from Preston or Ferguson Rivers including their tributaries and swamps or Leschenault Inlet and estuary.

Amalgamating the findings of the previous sites located confirmed that a number of burials have been recorded in the beach dunes around Bunbury and that all the artefact habitation type sites in the Bunbury area occur within 500 metres of either the Preston or Ferguson Rivers. The survey suggests that both of these landforms in the Bunbury area are likely to contain artefact material or burials.

The survey strategy comprised walking the entire easement at 20m intervals apart except where dense vegetation between Hastie Road and Lakes Road existed and subsidiary tracks were followed. Only two small quartz artefacts were found during the survey in a sand patch near a transmission pole.

Hammond, M. & O'Reilly, S. 1995, *Report on an Aboriginal Heritage survey Bunbury Bypass Road, Bunbury, Western Australia*, Prepared for Halpern Glick Maunsell

The study area comprised a proposed Bunbury Outer Ring Road survey extending from Eaton to north of Capel. The survey methodology consisted of systematic evenly spaced transects undertaken at 20m apart along the proposed road easement of native vegetation or pasture cover. The corridor crossed two major rivers, Preston and Ferguson.

Research indicated that 20 archaeological sites have been previously recorded within 10kms of the development area, most of which reflect a single or an ephemeral activity. These sites occur in intact or deflated Holocene dunes but natural deflation and disturbance from development have mostly affected the integrity of these sites. To utilise the wetland resources, the majority of sites are within 500m of major wetlands, lakes and estuaries of the coastal plain and rivers which drain into them. The discovery however of a site near water resources depends upon the amount of vegetation obscuring it.

Five archaeological sites were located on exposed yellow sand and each contained quartz artefacts. In addition four previously recorded sites were relocated and were also found on yellow sands in road cuttings. All were deemed to be of low significance. The authors predict that because of Aboriginal focus on resource procurement, areas most likely to provide favourable campsites locations are elevated, well drained areas close to water and fish and game resources. Access corridors would have been utilised between these major resources. Rather than beside the rivers providing more permanent resources, sites were generally at small, swampy or seasonally inundated areas. The context of many of these sites located in road cuttings, dams, or paddocks, has contributed to their destruction and lack of integrity.

Goode, B. & Harris, J. 2010, *An Aboriginal Heritage Survey of the proposed Bunbury Outer Ring Road (Stage 1) and the Port Access Road (Stage 2) at Picton, Western Australia*, Prepared for GHD on behalf of MRWA.

The study area includes some 11km of proposed roadway extending in width from 20m to 400m allowing for turning lanes. The area extends from 7kms southeast of Bunbury on South Western Highway at Centenary Road, crosses Preston River, to Moore Road and continues to Boyanup Picton Road. The Port Access Road spur extends from Boyanup Picton Road south crossing the Ferguson River while another isolated spur extends east west off Moore Road.

The survey of the proposed route comprised two persons walking abreast in transects, spaced 30m apart in the wider sections or a single person walking transects in the narrow sections. In addition, predictive intensive transects were conducted at firebreaks, devegetated patches, along the river bank where the route crosses on two occasions and any other area of site potential.

No new archaeological sites were located. Three isolated artefacts, however, were located. These were located on a yellow sandy embankment comprised of road building debris suggesting it was used as a dump and borrow pit. The proposed highway route will impact six previously registered archaeological sites. Each of these sites lies within unstable sands of embankments and has previously been disturbed by road and rail works. All of the sites are small in extent and density. Presently they are situated in vulnerable states where natural erosion and heavy vehicle traffic serves to further affect the adjacent dunes. As a result of their fragility, disturbance and limited integrity they are considered of limited significance. Despite the importance of water in the location of sites the flat low-lying terrain of the western section of the project area near Preston River appears to have been unsuitable for campsites while the eastern section near Ferguson River where sand dunes are present proffers desirable and dryer locations.

Goode, B. & O'Reilly, T. 2012, *An Aboriginal Heritage Survey of the proposed Bunbury Outer Ring Road (Stage 2) at Gelorup, Western Australia*, Prepared for GHD on behalf of MRWA.

The survey concerns plans to construct a dual carriageway and associated overpasses and service roads within the Bunbury Outer Ring Road (Southern Section) Area. It is centred 9km SSE of Bunbury traversing cleared paddocks and road reserve corridors with some patches of remnant bush. It extends for approximately 9km from South Western Highway near the

intersection of Centenary Road to Bussell Highway between Woods Road and Calinup Road and varies in width from 50m to 150m.

The project area was surveyed by walking a series of transects along the entire length of the survey area following the alignment and spaced at approximately 20m to 30m intervals. Part of the survey area between Cokelup Road and Jilley Road and which is traversed by a narrow ephemeral drainage line, was targeted and scrutinised for the presence of Aboriginal archaeological material by walking along the sides and margins of this drainage line and examining the exposed banks and adjacent cleared ground.

The low surface visibility encountered in some parts of the study area can cause sites and archaeological material to be overlooked. A moderate to dense cover of grass and leaf litter in some parts of the survey area made it very difficult to see or find any Aboriginal archaeological material that may have been on the obscured ground surface. However, it should be noted that searches of fence lines, fire breaks and cleared tracks and their margins as well as other opportunistic exposures with high surface visibility adjacent to these parts of the survey also yielded no Aboriginal archaeological sites or material.

O'Reilly, T. 2019, *Addendum to the report of an Archaeological Survey of the Bunbury Outer Ring Road (Southern GBRS Corridor) Gelorup, Western Australia*, Prepared for MRWA.

An additional survey was conducted on the Gelorup section of the proposed Bunbury Outer Ring Road for some 2.5 kilometres long and 70m-200m wide between Jilley Road and Bussell Highway. It had been reported to MRWA that culturally modified trees were present that may have been overlooked in previous surveys.

The survey strategy comprised walking a series of transects across the area at NS orientation spaced at 20m apart. The criteria accepted throughout Australia to identify Aboriginal scarred trees were used. A number of trees were recorded that had visible non-cultural scars. Some 12 trees that exhibited markings were measured, photographed and assessed in accordance with accepted protocol. Ten jarrah trees, a marri and a banksia tree were addressed and mapped. No culturally modified trees were identified. The non-culturally modified trees were recorded in a report to demonstrate various types of naturally occurring scarred trees that can exist in the area.

The author notes that culturally modified trees have scars located above ground level that are easy to reach and not at the base of a tree nor extending beyond a height that a person can reach. Culturally modified trees have a pointed or rounded beginning and end and are not irregular. Natural scars also occur on tree species known to be scarred by humans. Branches can tear away from the trunk leaving irregular scars with a pointed end. Bush fires char trees from the base upwards and lightning strikes produce a scar that continues to the ground. Some of these events of natural scars can be confused with cultural scars.

The author states there is evidence that large trees have been cut down in the past as well as more recently. This can result in incidental damage to other trees. Each tree was analysed on its own merits and a decision made pertaining to its origin.

SUMMARY OF REPORT RESEARCH

The reports establish that the majority of sites and heritage places were located in 1970s/80s when an expansion in industrial and residential development commenced within and outside the Bunbury town centre. One heritage place (Hammond & O'Reilly 1995) was the exception having been located in mid 1990s. All recorded sites were observed to be in vulnerable positions as the growth of the Greater Bunbury township had a substantial impact.

Many of the sites were located in disturbed ground in yellow sand that is elevated and well drained but close to a water source. Within the reports, the consultants concur that the majority of artefact scatters are generally located in the vicinity of rivers, creeks, lakes, swamps and estuaries, or specifically within 500m of Preston and Ferguson rivers on yellow or grey sands.

The reasons attributed to the lack of sites found subsequent to the 90s is poor visibility, disturbance from housing, industry and farming and the foraging strategies of Aboriginal people that left minimal evidence excepting the occasional isolated artefact. While poor visibility from dense ground cover is the major factor in the location of sites, the disturbance factor is a major handicap depending upon the degree of alteration to the area. There are a limited number of culturally modified trees located in the outer Bunbury region, the result of wholesale removal of trees for development, utilitarian and farming purposes.

ARCHAEOLOGICAL CONTEXT

A considerable amount of research has been conducted in the southwest corner of Western Australia (see Dortch 1977, Hallam 1986, Ferguson 1985, Pearce 1982) and as a consequence the archaeological patterning of the region is well developed. The study area is located within the coastal sand dunes and sand plains of greater Bunbury.

Ethnographic and archaeological surveys on the Swan Coastal Plain have confirmed the concentration of Aboriginal occupation around wetlands, swamps, rivers and estuaries (O'Connor et al 1995). This pattern was originally proposed by Hallam (1986) on the coastal plain around Perth and further enforced by subsequent research. An anomaly to this archaeological patterning, however, was suggested by Veth & Moore (1989), after an extensive survey of the Scott Coastal Plain which failed to locate any archaeological material, suggesting a very low occupation density for the low-lying swampy plain.

A variety of ethno-historical sources describe the activities of Aboriginal people on the coastal plain, their subsistence techniques and semi-permanent camps about wetlands during summer. Several sources have noted that people dispersed in winter to hunt in the forested uplands, yet there is scant information pertaining to this part of the subsistence cycle. On the basis of ethno-historical evidence, Hallam (1979) has proposed that the forest was little exploited and the less dense woodland further inland was targeted by Aboriginal groups.

An alternative model has been proposed by Anderson (1984) and Pearce (1982) based on studies carried out in jarrah forests where they propose that the resources of the forest were widely exploited by highly mobile hunting groups but these groups did not establish large camp sites. Both recorded numerous small artefact scatters, comprised predominantly of quartz tools and debitage. In the South Canning Forest Anderson estimated a density of 1.7 sites per square kilometre while Pearce found a density of 1 site per square kilometre in Collie. Anderson also noted the particular problems concerning low visibility and poor access inherent in the survey of forests.

Excavations were undertaken in jarrah forests by Pearce (1982) and Anderson (1984) where datable organic material was recovered. A sandy site on the edge of a swamp at Collie established occupation at 5810 ± 330 BP in the deepest part of the forest; a cave at Boddington yielded a date of 3230 ± 170 BP; while Anderson recovered a date of 1280 ± 80 BP at North Dandalup.

One of the earliest sites providing evidence for prehistoric occupation of the South-West of Australia is an alluvial terrace site at Upper Swan, located 25 km north-east of Perth and dated at 38,000 BP years (Pearce and Barbetti, 1981). Two other sites in the south-west have also yielded Pleistocene dates, Devil's Lair near Margaret River and Helena River. The length of occupation at the limestone cave at Devil's Lair ranges from 47,000 years BP to 6,500 years BP while Helena River yields an early date of 29,000 BP years from the basal level as well as a mid-Holocene date of 4,000 BP closer to the surface (Dortch 1977, 2002, Schwede 1990). In

addition, Dortch (1975) located a silcrete quarry and manufacturing site on the Darling Plateau at Northcliffe. His excavations revealed extensive use of geometric microliths from prior to 6,000 BP until 3,000 BP.

South of the study area, Lilley (1993) surveyed the coastal plain and forest uplands around Margaret River but failed to find any archaeological material in the forest and few sites on the coastal plain. He concludes that the faint archaeological signature of the region is the result of low population densities caused by a relatively impoverished resource base, particularly in jarrah forests. He considers that the technical problems inherent in the region of low site survival rates, poor access and low surface visibility, while contributing factors in site surveys, nevertheless do not affect the outcome of an actual scarcity of archaeological sites in the area.

Southeast of the study area Ferguson (1985) produced an occupation model for the far southwest predicting extensive use of uplands during earlier times of cooler, drier climate and less dense forest. With increased rainfall and subsequent increase in forest density during the early Holocene, Ferguson proposed sparser occupation in the forest uplands and increased occupation of the coastal plain and interior woodlands.

Research into occupation patterns on the coastal plain, woodland and jarrah forest of the Perth region can be transposed to the lower south-west because of the similar environmental and geomorphic features. A large data base on site locations and assemblages exists as a result of a systematic study of the Swan Coastal Plain undertaken by Hallam (1986) in the 1970s and early 1980s. Hallam's objective was to explain the changing occupation patterns of prehistoric Aboriginal populations. Using numbers and types of sites within ecological zones as a means of comparison, Hallam describes the patterning and nature of archaeological assemblages from the littoral zone, through the coastal sand plain to the foothills and Darling Scarp.

Hallam concludes that Aboriginal occupation was focused around lakes and swamps of the Bassendean Sands and Pinjarra Plains and these occupation sites double numerically in the last few hundred years before European contact. A broad chronology was developed based on the presence of certain indicators within the assemblage. The presence of fossiliferous chert indicates the Early Phase, backed pieces and flat adzes the Middle Phase, quartz chips the Late Phase and glass or ceramic, the Final Phase. Schwede (1990), in a more recent analysis of quartz debitage, finds these chronological markers problematic, in particular, the Late Phase and concludes that all phases were rich in quartz assemblages.

From such research, a predictive model of site type and location can be projected for the study area. There is a high probability that, if any sites are located, they will be scatters of less than 10 artefacts and manufactured from quartz. These sites will occur in proximity of a water source and be situated in disturbed areas and yellow/white sand dunes. It is necessary, however, to take into account the high level of disturbance caused by intensive farming by European colonists in the C19th and C20th and later industrial development that may have largely obliterated or camouflaged archaeological sites.

SITE SIGNIFICANCE

The significance of an archaeological site is determined by its ability to address regional and site-specific research questions and by its representativeness (Bowdler 1984). Significance is a mutable quality, changing as more sites are recorded, research questions are answered or new research directions arise. Research questions that sites in the south-west may address include:

- a) the antiquity of colonisation of the southwest zone;
- b) social and technological changes that may have occurred in the mid-Holocene;
- c) specific patterns of occupation in regional zones; and
- d) the dating of the industrial sequences in the region.

SURVEY METHODOLOGY

The survey was conducted using a Garmin GPSmap 60CS on datum GDA and several aerial maps at 1:10,000 demarcating the proposed project corridor. Three A2 cadastral maps at 1:1700 scale denoting plot divisions were used to define boundaries of lots along with a list of 90 landowners listing specific conditions of entry for each property. Each landowner was contacted by the BORR team with advance warning some time prior to the survey and again closer to the survey. Some landowners required the survey team to be escorted while others required biosecurity conditions concerning vehicle and surveyors' clothes prior to entry. Where requested appointed times of survey were adhered to by the survey team. The survey design was formulated using a combination of predictive, systematic and opportunistic transects throughout the study area with particular emphasis on devegetated areas and water resource locations.

The field survey was undertaken on 28th October to 1st November 2019 and conducted by Mrs Jacqueline Harris, senior archaeologist and Dr Vicky Winton, archaeologist. Mr James Khan and Mr Joe Northover, Gnaala Karla Booja native title claim group representatives, accompanied the survey. These representatives were selected from the list nominated at GKB working party at SWALSC prior to the survey.

The survey strategy varied for each specific lot within the corridor. Generally a sample survey of the study area to identify any archaeological sites incorporated one person meandering over a given area or two persons walking transects spaced at 25m apart over sections of the study area or in close proximity where applicable. At the same time, where 4WD vehicle driving was permitted, two other persons drove meandering transects inspecting features and individual trees. Predictive intensive transects were conducted at potential areas of interest such as devegetated patches, remnant woodland and in the vicinity of wetlands. It was estimated that the overall percentage coverage of the designated project area was around 50%. Ground visibility was limited throughout at around <5% within densely covered paddocks and road verges thick with shrubs and grasses throughout the route. Other paddocks were sandier and lightly wooded that allowed up to 80% improved visibility.

Where several farms and properties on the alignment had biosecurity concerns, the wheels of the 4WD tyres had to be cleaned and brushed and soles of shoes of the survey team washed with methylated spirits combined with water spray in order to be free of extraneous sediment or seeds. Each day the 4WD vehicle was washed at a car wash to remove any foreign material such as sediment, clay, seeds or manure. A number of tiger and dugite snakes had been recently sighted in the area and as the weather had just warmed up and the breeding season commenced, extreme caution was taken.

An ethnographic survey was undertaken on 8th November 2019. The archaeologist, Mrs Jacqueline Harris, accompanied the anthropologists, Dr Eddie McDonald and Ms Jan Turner, together with the GKB traditional owners selected by the working party at SWALSC prior to the survey. These included Mr Joe Northover, Mr Murray Collard, Mr James Khan, Ms Lera Bennell, Mr Les Wallam, Mr Dennis Jetta, Ms Annette Garlett, Ms Joyce Dimer and Mr Peter Michael. Mr Neil McCarthy, Senior Environmental Officer, MRWA and Dr Fionnuala Hannan, Environmental and Approvals Manager, BORR IPT.

During the ethnographic survey, the findings of the archaeological survey were discussed with all parties involved in the survey. Two archaeological heritage places, an artefact scatter and a putative scarred tree, were then surveyed by the team in order to establish the Aboriginal viewpoint upon these cultural material remains. A section of the Gelorup corridor was then inspected to ascertain where a wooden artefact associated with a recently lodged heritage place was located. Mr Dennis Jetta also pointed out a putative Aboriginal scarred tree just north of this location as well as several individual putative scarred specimens located along Woods Road.

SURVEY AREA

In the northern and larger section, the proposed corridor passes through flat low-lying paddocks that have been cleared of vegetation for farming activities. There are a number of wetlands amid the paddocks and several groves of remnant trees remain. One particular grove of remnant banksias dominates a sandy mound. Sand quarrying has affected the middle portion of the study area.

The central section of the proposed corridor is lightly and moderately wooded with remnant trees on undulating land and has not been subject to farming activities. The ephemeral creek, Five Mile Brook, crosses the Gelorup sector of the alignment.

The southern section is disturbed road reserve with remnant trees, regrowth and revegetation along with the highly disturbed front yards of rural properties. Where extensive disturbance has not taken place some remnant examples of old paperbarks and other species of old trees are present.

The corridor has been extensively disturbed by associated infrastructure such as roadworks, transmission lines, gas pipelines, electricity and telephone cabling. All trunks of trees were examined for possible human modifications. A number of high yellow sand dunes are present in the northern sector of the corridor. Native vegetation present includes paperbark, peppermints, river gum, acacia, jarrah, marri, banksia, Christmas trees, Sheoak and grass trees. Many road and highway verges have been revegetated or contain remnant specimens of native trees.

FIELD SURVEY RESULTS

One new archaeological site, BR1, as defined by Section 5a of the AHA was located approximately 60m from the BORR south corridor within the 2019 survey area (Figure 2). No isolated artefacts were located. One previously recorded archaeological heritage place, DPLH ID 18884, was relocated within the project area. The survey techniques employed during the field survey were sufficient to have located any major archaeological site present and visible on the surface.

BR1

BR1, a modified tree, was located in a mostly cleared paddock adjacent to surrounding wetlands (see Figures 3 and 4). The grid reference was Zone 50 375819mE 6303829mN. The scar was identified on an old tall jarrah tree, ~13m high and estimated age ~150 years old. The tree is now dead as evidenced from dead limbs on the crown and fallen branches on the ground and it had a pronounced lean to the west. There were no bough scars on the length of the trunk until 6m from the base. There were two other natural scars that commenced at the base of the trunk but these were ill-defined and the result of a physical trauma at a later event. The identified scar measurements were 54cm long x 26cm wide x 7cm deep and faced in a SSE direction. For the length of the scar there was a slight bulge in the tree. The scar commenced at 115cm above the ground. The diameter of the tree at breast height is 95.5cm.

The scarred tree fitted five DPLH criteria for a modified tree: indigenous species and mature; scar begins above ground level; parallel and symmetrical; bark regrowth regular; and scar terminations pointed. Its possible use was as a utensil or cultural marker. The jarrah tree is vulnerable to the elements sitting on an open plain and to insect attack and as it is already dead, its life span of remaining erect, albeit at a pronounced lean, is limited.

The archaeological significance of the tree is considered moderate. As few culturally modified trees remain in the area from wholesale clearance and logging in the Bunbury region, the scar offers some research potential but the tree, itself, has a limited future due to its poor condition.

As the jarrah tree is located some 63m outside the area of disturbance by the proposed BORR. It is unlikely to be either directly or indirectly impacted as a result of the construction and operation of the BORR Southern section.

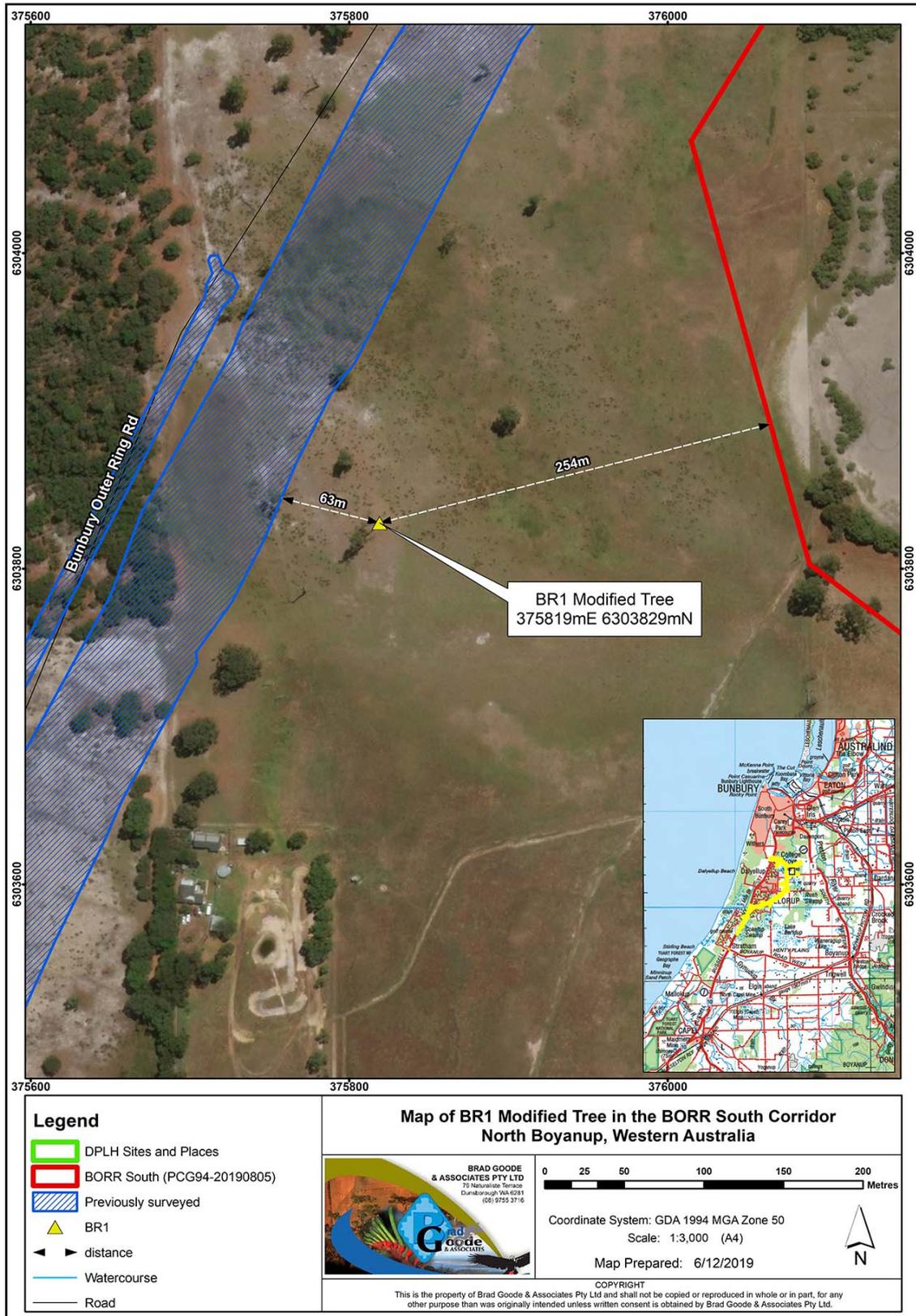


Figure 2: Map of BR1 Modified Tree in the BORR South Corridor.



Figure 3: BR1 culturally modified jarrah tree at 375819mE 6303829mN.



Figure 4: Looking at old dead jarrah tree bearing scar BR1.

Place ID 18884 Bunbury Bypass Archaeological Site 1

Place ID 18884 is a highly disturbed small artefact scatter (Figure 5). It was recorded by Hammond and O'Reilly (1995) where 14 artefacts were located and reappraised in 2012 (Goode & O'Reilly) where 20 artefacts were located. The site was re-examined in the present archaeological survey in 2019 where only six artefacts were observed in the eastern end only. Road material debris was numerous and extended some 30m into the site at the central northern section alongside Hastie Road. A week later, another inspection occurred as part of this archaeological survey where some 11 artefacts were observed and measured, all in the eastern sector on the yellow sandy mound adjacent to the fence line on the corner of Hastie and Allenville Roads. These artefacts included three flakes (27%), six flaked pieces (55%) and two chips (18%) all manufactured on quartz or crystal quartz (Table 2). Each artefact's position was recorded within the mound that extended over an area 30mNS x 35mEW. The location of the site is shown in Figure 7.

A pile of animal bones and stones have been collected for unknown purposes at grid reference 375254mE 6302418mN (see Figure 6) within this site. The wetland map produced by BORR IPT shows the heritage place is totally surrounded by wetland so this yellow sandy once high dune would have been a convenient temporary campsite and perhaps the only refuge of high ground in the immediate area. While low numbers of artefacts have been observed, the fact that three inspections over 24 years have continually revealed artefacts despite the site having been extensively modified by construction of a dam and adjacent road works suggests more artefacts may be recovered. There is no stratigraphic integrity remaining in the unstable highly disturbed sandy mound and therefore no research potential present. However the measurement and analysis of any artefacts recovered would assist in adding to the database of the region.

The plans for BORR South will partially impact the heritage place. The proposed road works intrude into the heritage place by up to 25m south of Hastie Road for 200m and up to 100m west of Allenville Road extension for 90m south of Hastie Road. While the northern intrusion impacts on a section that is covered in road work debris, the eastern section is where many of the artefacts have been exposed overtime and are presently visible.

Table 2: DPLH ID 18884 Artefact measurements.

Type	Lithology	Length (mm)	Width (mm)	Thickness (mm)	Platform Type	Platform Surface	Platform Width (mm)	Platform Thickness (mm)	Termination	M or D Scars (No.)	Cortex (%)
F	Q	22.5	18.7	5.2	Removed				St	2	0
F	Q	33.4	30.5	8.5	W	Fl	14.9	7.6	St	2	10
FP	CQ	20.5	22	8.5							0
FP	Q	14.9	11.6	6.1							5
FP	Q	14.7	10.5	5.3							0
FP	Q	16.5	7.5	3.9							0
FP	Q	13.5	11	4.9							0
FP	Q	17.2	8.9	5							0
F	CQ	13.2	9.7	1.9	Fo	Fl	3.7	1.2	F	1	0
Chip	CQ										
Chip	CQ										

Legend: Artefact Types: F - Flake, FP – Flaked Piece, Chip; Lithology: Q - Quartz, CQ – Crystal Quartz; Platform: Fl – Flat, Fo - Focused, W – Winged; Termination: St - Stepped, F - Feathered.



Figure 5: Looking E at heritage Place ID 18884 with yellow sand dune at rear where the artefacts are located.



Figure 6: Looking at a cache of bones and stones on the inner side of dam at heritage Place ID 18884.

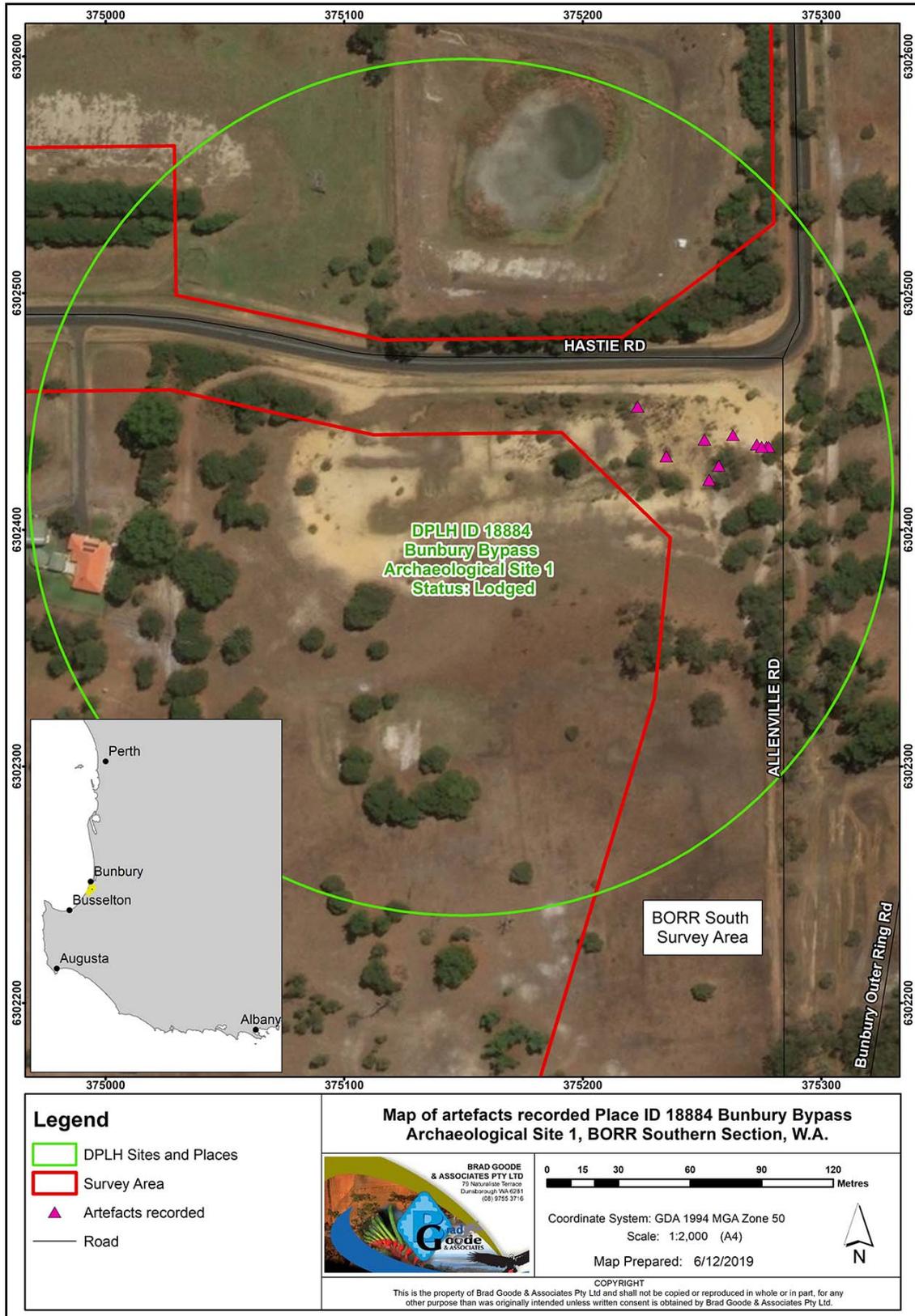


Figure 7: Map of artefacts recorded Place ID 18884 Bunbury Bypass Archaeological Site 1.

Place ID 37870 The Gelorup Corridor

The site file is closed and a men's only heritage place so details are unknown and thus cannot be described. The extent of the heritage place is 2 sq. km. A photograph of a putative message stick that was located within this area was sent to MRWA in January 2019. Two informants on separate occasions, a local homeowner, Glenys Malatesta, and Aboriginal elder, Dennis Jetta, pointed out the original location of the wooden piece on the archaeological and ethnographic surveys respectively. The grid reference was noted as Zone 50 373147mE 6300394mN. It was within the hollow of the root system and trunk of an old tree that had been uprooted some time ago. The hollow appeared to have been caused by the felling of the tree.

The actual message stick location is no longer subject to impact from the proposed bypass as it adjoins the site of an old tall Tuart tree. As a result of members of the public's interest in conserving the tree, BORR's plans have altered, moving the proposed alignment further north to avoid the aged tree and subsequently the original putative location of the wooden artefact.

CONCLUSIONS

DISCUSSION

The Bunbury Outer Ring Road South proposed corridor has been subject to four archaeological and three ethnographic surveys over 24 years. Some six independent archaeologists and four anthropologists have undertaken these studies. As a result of their investigation, one archaeological heritage place, **Place ID 18884 Bunbury Bypass Archaeological Site 1**, has been located. One other heritage place, **BR1**, a scarred tree, has been reported in this survey. This tree is located on private farmland that had not been surveyed before but the land is now within a northern connecting section of the proposed route. This large amount of survey and research draws three possible conclusions:

1. there are no heritage sites or places visible on the surface within the proposed corridor;
or
2. there were no heritage sites or places within the proposed corridor; or
3. that the area has been extensively disturbed by housing development, farming and industry.

In addition to the surveys by heritage specialists, several traditional owners accompanied each of the archaeological teams during the surveys to advise and impart their knowledge of country. After each archaeological survey the anthropologist followed accompanied by up to 8-10 Aboriginal traditional custodians mostly from Gnaala Karla Booja native title claim group that are the legitimate Aboriginal body designated by SWALSC that speak for the area. The fact that no heritage sites were registered in any of these surveys indicates that no sites of significance to Aboriginal people that fit the criteria of AHA are present within the area.

Since 2018 many putative sites have been reported and submitted to the holder of Aboriginal heritage details in Western Australia, DPLH, by non-specialists. These putative sites include numerous scarred trees, a men's ceremonial site and a women birthing place. In recording these places, no one has sought the opinion of the GKB and heritage specialists. To override the main Aboriginal body entrusted with looking after the land reveals a great misunderstanding of the culture of the GKB and the Aboriginal heritage recording system by the people who made these reports. The submission of these putative places without consulting the GKB has caused great sorrow, mistrust, shame and disharmony within and between Aboriginal family groups.

The AHA is the first comprehensive heritage act promulgated in Australia and DPLH is the one official agent in Western Australia that seeks to conserve heritage sites for Aboriginal people and the community. The AHA should not be misused in this manner and the system

overwhelmed by continuous unsubstantiated ambient claims in order to prevent infrastructure activities, noble or otherwise.

In regard to the wooden artefact that is said to have been located on the edge of the proposed BORR corridor within the Gelorup section, the fact that the finder's name has not been declared to the writer, the artefact has not been sighted by a heritage expert and that it has been removed from its location excludes it from any archaeological significance assessment. Archaeological research has demonstrated that a complete wooden artefact is highly unlikely to remain intact cached within or on top of the ground in the hollow of a tree root stump. No other wooden artefact has survived in the southwest with its high rainfall and termite activity. Hearsay suggests it was cleaned after being discovered which destroys all scientific evidence including inherent sediment deposits that could determine where the wooden piece originated or was stored overtime. Needless to say it is an offence under the AHA to remove an artefact from its original location. Heritage experts, Aboriginal people and industry observe these regulations alike and a Section 16 of the AHA must be applied for in order to remove similar articles from their finding place.

Many naturally scarred trees in the BORR corridor have been interpreted by interested parties as being culturally modified by Aboriginal people in the past. There are few remaining examples of Aboriginal culturally modified trees in the Bunbury region as a result of intensive development and land clearing. To identify a specimen the natural agencies must firstly be discounted before a humanly modified agent can be considered. Generally trees altered by Europeans leave a more haphazard scar. Aboriginal people were highly selective of the tree species, particular trees chosen and the specific area for scarring and were economical and methodical in their cutting actions.

Archival research indicates that a number of archaeological sites have been recorded in the Bunbury region with the majority of these being artefact scatters. These consist generally of small quartz artefact scatters with additional pieces manufactured from silcrete, chert or fossiliferous chert. Artefacts comprise mostly flakes and chips but included in the assemblages are the occasional backed blade or hammer stone. The contents indicate camping and hunting and gathering forays were undertaken at these locations. All the sites are found within yellow sand dunes or sand quarries across the landscape. Each site is located in the vicinity of a river or near a swamp on high sand dunes. The cluster of sites in the Bunbury region indicates land in the vicinity of a water source is a particularly resource rich area to Aboriginal people.

Prior to European colonisation, the Aboriginal GKB people utilised these lands favouring the higher lands of the coastal sand dunes of Bunbury and fertile lowlands for occupation and burials as evidenced by a number of artefact and skeletal material sites located in the region. Archaeological evidence can also be found in association with the highly desired locations of the original homesteads of the first European settlers. Occupation by the settlers forced immediate dislocation and restrictions on the occupation and cultural cycle of the GKB people. Original settlement followed by the township of Bunbury that later expanded into greater Bunbury, impacted further on the Aboriginal community whose lands, rivers and wetlands and their cultural lifestyles were effectively subsumed within the new housing developments.

RECOMMENDATIONS

BR1, a modified tree, is a culturally modified scar on an old dead jarrah tree. While the prospect of a long life is limited, there are few similar examples in the area. As it holds moderate significance and some research potential **it is recommended** that the location be avoided.

If MRWA wish to disturb **BR1** then a Section 18 application under the AHA should be submitted to DPLH seeking permission. If permission is granted, this should be conditional on further recording and/or removal of the said trunk to a nominated repository.

Place ID 18884 Bunbury Bypass Archaeological Site 1 is a highly disturbed small artefact scatter. If MRWA wish to disturb **Place ID 18884**, then a Section 18 application under the AHA should be submitted to DPLH seeking permission. Because of its present condition due to extensive disturbance, low number of artefacts observed and subsequent reduced scientific research potential, **it is recommended** that permission be granted conditional upon all ground works at this location being monitored by two Aboriginal traditional custodians and any artefacts, if present, collected, measured and reburied in a safe repository.

The removal or excavation of large quantities of sediment increases the risk of disturbing archaeological sites that may lie beneath the ground surface. As there are several high sand dunes, some wetlands and an ephemeral brook that have some potential to contain artefactual material, **it is recommended** that initial ground works at these topographic features be monitored by two Aboriginal traditional custodians and any artefacts, if present, collected, measured and reburied in a safe repository.

In other areas not subject to monitoring procedures, **it is recommended** that MRWA inform any project personnel of their obligation to report any archaeological material, should this be encountered during earthmoving, as outlined under Section 15 of the AHA.

If MRWA locate an archaeological site in the process of survey or ground excavation, **it is recommended** that work cease in the immediate area. Any skeletal material should be immediately reported to the Department of Planning, Lands and Heritage, and the Western Australian Police Service. Any artefactual material should be reported to Heritage and Culture Division, Department of Planning, Lands and Heritage.

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APPENDIX 1: DPLH SITES AND PLACES REGISTER SEARCH

List of Registered Aboriginal Sites

Search Criteria

No Registered Aboriginal Sites in Shapefile - BORRSouthReferralBoundary_BORR_PCG94_20190805

Disclaimer

The *Aboriginal Heritage Act 1972* preserves all Aboriginal sites in Western Australia whether or not they are registered. Aboriginal sites exist that are not recorded on the Register of Aboriginal Sites, and some registered sites may no longer exist.

The information provided is made available in good faith and is predominately based on the information provided to the Department of Planning, Lands and Heritage by third parties. The information is provided solely on the basis that readers will be responsible for making their own assessment as to the accuracy of the information. If you find any errors or omissions in our records, including our maps, it would be appreciated if you email the details to the Department at heritageenquiries@dplh.wa.gov.au and we will make every effort to rectify it as soon as possible.

South West Settlement ILUA Disclaimer

Your heritage enquiry is on land **within or adjacent to** the following Indigenous Land Use Agreement(s): Gnaala Karla Booja People ILUA.

On 8 June 2015, six identical Indigenous Land Use Agreements (ILUAs) were executed across the South West by the Western Australian Government and, respectively, the Yued, Whadjuk People, Gnaala Karla Booja, Ballardong People, South West Boojarah #2 and Wagyl Kaip & Southern Noongar groups, and the South West Aboriginal Land and Sea Council (SWALSC).

The ILUAs bind the parties (including 'the State', which encompasses all State Government Departments and certain State Government agencies) to enter into a Noongar Standard Heritage Agreement (NSHA) when conducting Aboriginal Heritage Surveys in the ILUA areas, unless they have an existing heritage agreement. It is also intended that other State agencies and instrumentalities enter into the NSHA when conducting Aboriginal Heritage Surveys in the ILUA areas. It is recommended a NSHA is entered into, and an 'Activity Notice' issued under the NSHA, if there is a risk that an activity will 'impact' (i.e. by excavating, damaging, destroying or altering in any way) an Aboriginal heritage site. The Aboriginal Heritage Due Diligence Guidelines, which are referenced by the NSHA, provide guidance on how to assess the potential risk to Aboriginal heritage.

Likewise, from 8 June 2015 the Department of Mines, Industry Regulation and Safety (DMIRS) in granting Mineral, Petroleum and related Access Authority tenures within the South West Settlement ILUA areas, will place a condition on these tenures requiring a heritage agreement or a NSHA before any rights can be exercised.

If you are a State Government Department, Agency or Instrumentality, or have a heritage condition placed on your mineral or petroleum title by DMIRS, you should seek advice as to the requirement to use the NSHA for your proposed activity. The full ILUA documents, maps of the ILUA areas and the NSHA template can be found at <https://www.dpc.wa.gov.au/swnts/South-West-Native-Title-Settlement/Pages/default.aspx>.

Further advice can also be sought from the Department of Planning, Lands and Heritage at heritageenquiries@dplh.wa.gov.au.

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Aboriginal Heritage Inquiry System

List of Registered Aboriginal Sites

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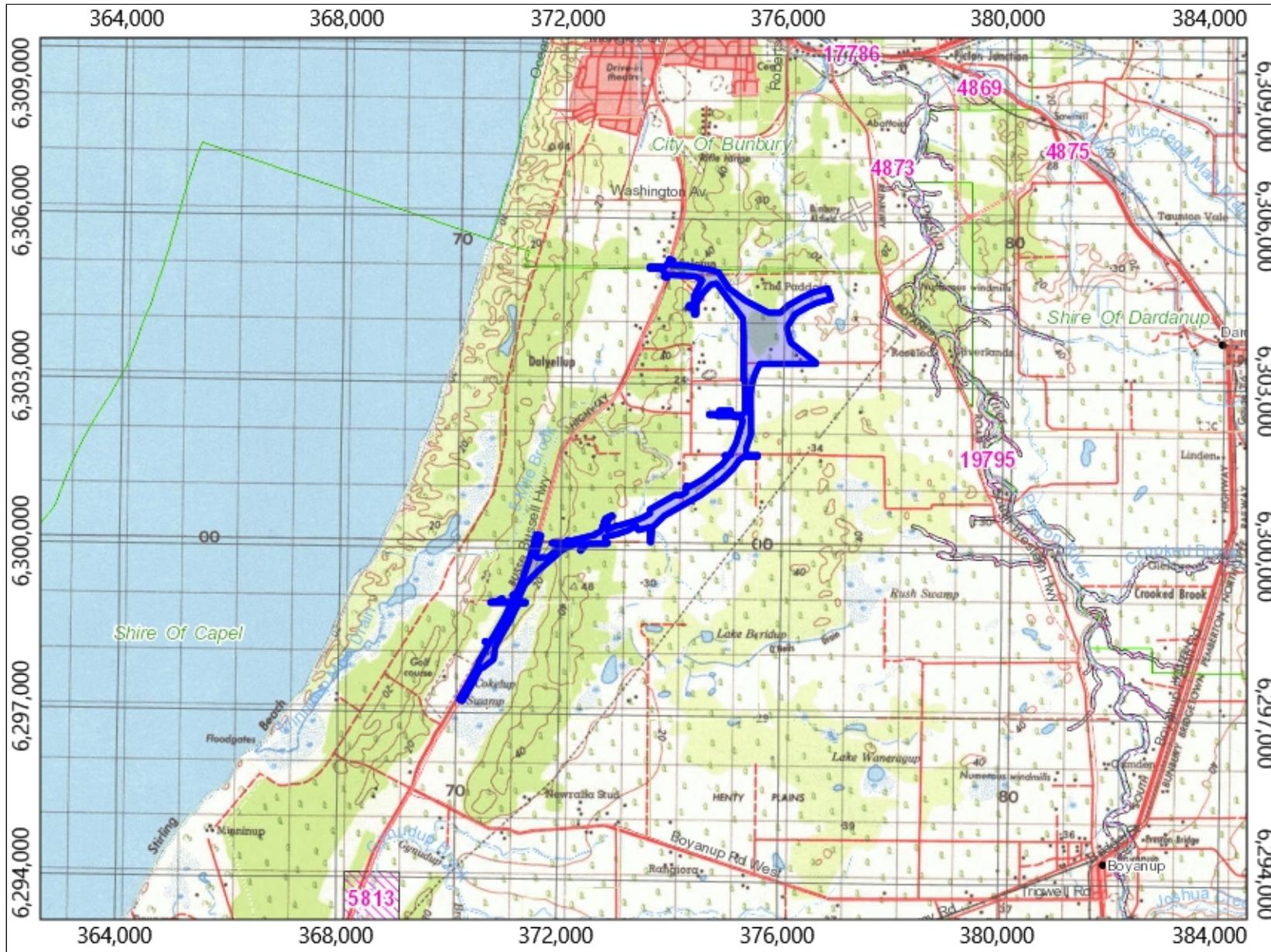
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Aboriginal Heritage Inquiry System

Map of Registered Aboriginal Sites

For further important information on using this information please see the
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<https://www.dph.wa.gov.au/about-this-website>



Legend

- Registered Aboriginal Site
- Search Area
- Town
- Road
- River
- Local Government Authority

4.18 kilometres
 Map Scale 1 : 127,000
 MGA Zone 50 (GDA94)

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List of Other Heritage Places

Search Criteria

3 Other Heritage Places in Shapefile - BORRSouthReferralBoundary_BORR_PCG94_20190805

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List of Other Heritage Places

Terminology (NB that some terminology has varied over the life of the legislation)

Place ID/Site ID: This a unique ID assigned by the Department of Planning, Lands and Heritage to the place.

Status:

- Registered Site: The place has been assessed as meeting Section 5 of the Aboriginal Heritage Act 1972.
- Other Heritage Place which includes:
 - Stored Data / Not a Site: The place has been assessed as not meeting Section 5 of the Aboriginal Heritage Act 1972.
 - Lodged: Information has been received in relation to the place, but an assessment has not been completed at this stage to determine if it meets Section 5 of the Aboriginal Heritage Act 1972.

Access and Restrictions:

- File Restricted = No: Availability of information that the Department of Planning, Lands and Heritage holds in relation to the place is not restricted in any way.
- File Restricted = Yes: Some of the information that the Department of Planning, Lands and Heritage holds in relation to the place is restricted if it is considered culturally sensitive. This information will only be made available if the Department of Planning, Lands and Heritage receives written approval from the informants who provided the information. To request access please contact heritageenquiries@dplh.wa.gov.au.
- Boundary Restricted = No: Place location is shown as accurately as the information lodged with the Registrar allows.
- Boundary Restricted = Yes: To preserve confidentiality the exact location and extent of the place is not displayed on the map. However, the shaded region (generally with an area of at least 4km²) provides a general indication of where the place is located. If you are a landowner and wish to find out more about the exact location of the place, please contact the Department of Planning, Lands and Heritage.
- Restrictions:
 - No Restrictions: Anyone can view the information.
 - Male Access Only: Only males can view restricted information.
 - Female Access Only: Only females can view restricted information.

Legacy ID: This is the former unique number that the former Department of Aboriginal Sites assigned to the place. This has been replaced by the Place ID / Site ID.

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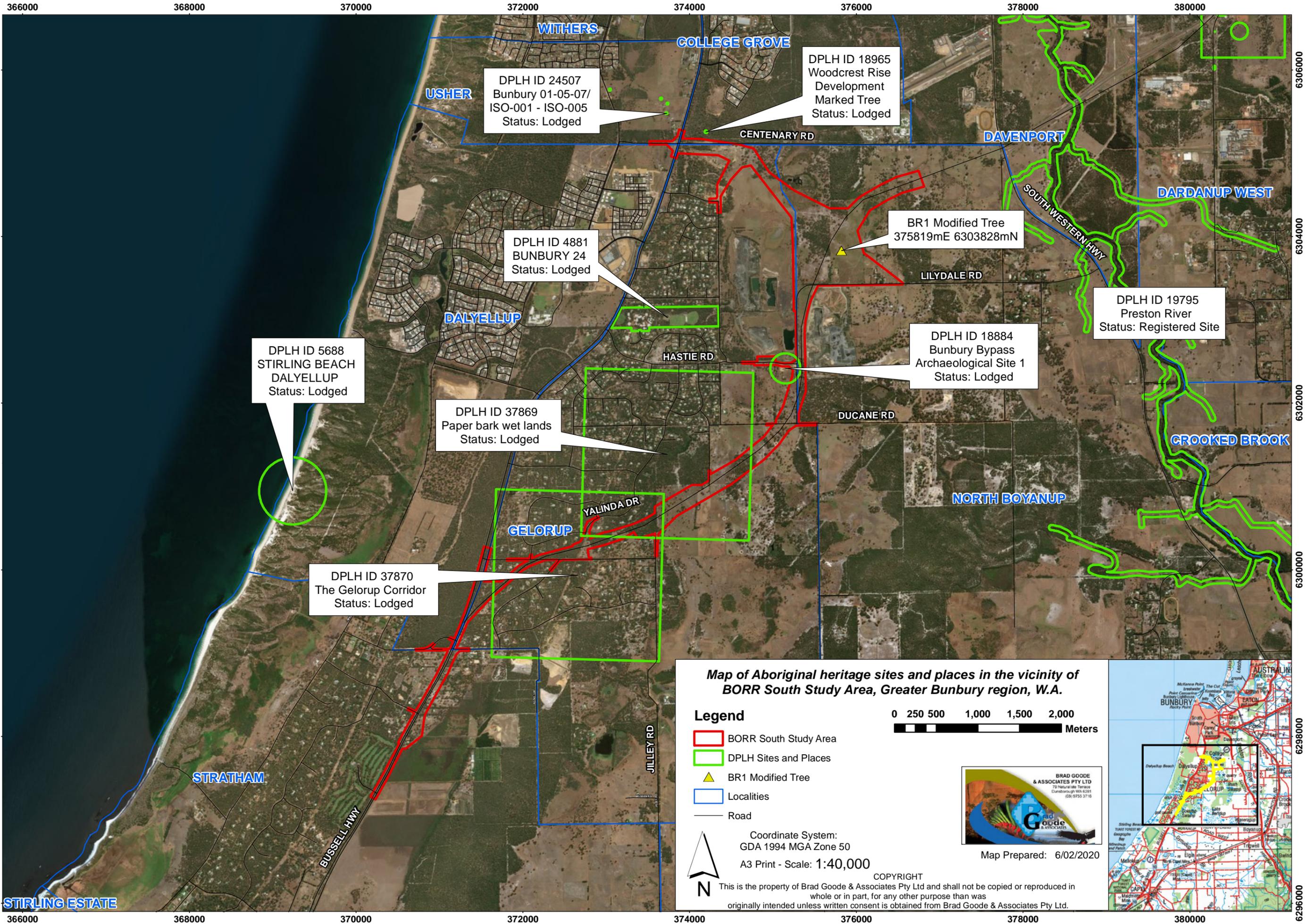


Aboriginal Heritage Inquiry System

List of Other Heritage Places

ID	Name	File Restricted	Boundary Restricted	Restrictions	Status	Type	Knowledge Holders	Coordinate	Legacy ID
18884	Bunbury Bypass Archaeological Site 1	No	No	No Gender Restrictions	Lodged	Artefacts / Scatter	*Registered Knowledge Holder names available from DAA	375149mE 6302418mN Zone 50 [Reliable]	
37869	Paper bark wet lands	Yes	Yes	Female Access Only	Lodged	Modified Tree, Birth Place, Hunting Place, Water Source	*Registered Knowledge Holder names available from DAA	Not available when location is restricted	
37870	The Gelorup Corridor	Yes	Yes	Male Access Only	Lodged	Artefacts / Scatter, Ceremonial, Skeletal Material / Burial	*Registered Knowledge Holder names available from DAA	Not available when location is restricted	

**APPENDIX 2: MAP OF THE PROJECT AREA IN RELATION TO
ABORIGINAL HERITAGE SITES**



366000 368000 370000 372000 374000 376000 378000 380000

6306000

6304000

6302000

6300000

6298000

366000

368000

370000

372000

374000

376000

378000

380000

6306000

6304000

6302000

6300000

6298000

6296000

Map of Aboriginal heritage sites and places in the vicinity of BORR South Study Area, Greater Bunbury region, W.A.

Legend

- ▭ BORR South Study Area
- ▭ DPLH Sites and Places
- ▲ BR1 Modified Tree
- ▭ Localities
- Road

0 250 500 1,000 1,500 2,000 Meters



Coordinate System:
GDA 1994 MGA Zone 50
A3 Print - Scale: 1:40,000



Map Prepared: 6/02/2020

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