



CULTURAL  
HERITAGE  
MANAGEMENT  
AUSTRALIA

Quoin Eco-Tourism Development Proposal  
Flinders Island, Tasmania

Aboriginal Heritage Assessment

Final Report

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**CLIENT NAME : Quoin**      **12.6.2015**

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## **Executive Summary**

### **Project Background**

Quoin are proposing to develop an eco-tourism development on the Quoin property located at Killiecrankie Bay on the north-west coast of Flinders Island. (see Figures 1 and 2). The development will include the construction of tourist accommodation. The designs for the proposed eco-tourism development is still in the early planning phase. A general schematic plan for the proposed eco-tourism development is presented in Figure 3.

CHMA Pty and Ltd and Vernon Graham (AHO) have been engaged by Quoin to undertake the Aboriginal heritage assessment for the proposed Quoin Eco-tourism development. The findings of the Aboriginal heritage assessment will help inform the final design plans for the eco-tourism development. Given that the eco-tourism design is still in the early planning phase, the assessment was focused across the broader Quoin study area, as shown in Figures 1 and 2. This report presents the findings of the assessment.

### **Registered Aboriginal Sites in the Vicinity of the Study Area**

As part of Stage 1 of the present assessment a search was carried out of Aboriginal Heritage Register (AHR) to determine the extent of registered Aboriginal heritage sites within and in the general vicinity of the Quoin study area.

The search shows that there are sixteen registered Aboriginal heritage sites that are situated within the general surrounds study area.

Two of these registered sites (AH 4148 and AH 4122) appear to be situated along the western edge of the boundaries of the Quoin study area, where it adjoins with the coastal reserve. AH 4148 is classified as a shell midden site which is located at the northern end of Killiecrankie Bay, just to the north of the point where Quoin Road enters the Bay. AH 4122 is also classified as a shell midden site. The site is located on the central portion of Killiecrankie Bay, and is associated with a limestone outcropping. The site cards for these two sites are presented in Appendix 3 of this report. An additional four registered sites are situated within a 1km radius of the Quoin study area.

The more detailed results of the AHR search are presented in section 4.4 of this report.

### **Summary Results of the Field Survey**

The field survey was undertaken over a period of three days (8-4-2015 to 10-4-2015) by Stuart Huys (CHMA archaeologist) and Vernon Graham (Aboriginal Heritage Officer). In total, 21.4km of transects were walked within and in the immediate surrounds of the Quoin study area, with each transect averaging 10m in width.

In the course of the survey investigations, the field team identified a total of four Aboriginal heritage sites. All four recorded sites are located in a very similar landscape setting, being situated along the fore dunes that fringe Killiecrankie Bay, within 50m of the high tide mark.

One of the recorded sites corresponds with a previously registered Aboriginal site that was identified in the immediate vicinity of the study area (site AH 4148). This site was originally recorded by Robin Sim in 1989, and was classified as a shell midden. The site is located along the coastal reserve, on the northern end of Killiecrankie Bay. During the present survey, a sparse scatter of shell material and three stone artefacts was identified in the general vicinity of the reported location of site AH 4148.

The other three Aboriginal sites are new recordings (sites AH13053, AH13054 and AH13055). Site AH13053 is classified as a shell midden with an associated scatter of stone artefacts. The site is located on the edge of the coastal reserve, around the central portion of Killiecrankie Bay. Site AH13054 is situated around the northern end of Killiecrankie Bay and is classified as a shell midden deposit. Site AH13055 is classified as an isolated artefact, and is located on a graded vehicle track, approximately 100m north of site AH13054. Both of these sites are situated on the edge of the coastal reserve that fringes Killiecrankie Bay.

Table i provides the summary details for the four recorded sites, with Figure i showing the site locations. The detailed site descriptions are presented in Appendix 2 of this report.

Site AH 4122 is a registered Aboriginal site that was reported to occur within, or in the immediate vicinity of the study area. The site was recorded by Robin Sim in 1989, and is classified as a shell midden site. It is reported as being located on the fore dunes along the central portion of Killiecrankie Bay, at grid reference E572813 N5591484. Despite undertaking an extensive search in the general vicinity of the reported site location, the field team could not find any evidence for this site.

No Aboriginal sites were recorded throughout the remainder of the Quoin study area. The negative findings for the remainder of the Quoin study area is assessed as being an accurate reflection of the fact that Aboriginal site and artefact densities throughout the inland portions of the Quoin study area, away from the coastal margins are low to very low.

**Table i: Summary details for Aboriginal heritage sites identified as part of the Aboriginal heritage assessment**

Site Name	Easting	Northing	Site Type	Description
AH13053	572633	5591104	Shell midden/Artefact Scatter	Site is located within a small swale on a fore dune that sits immediately above the shoreline of Killiecrankie Bay. The fore dune has formed over the top of an extensive outcropping of calcarenite limestone that extends along this section of the beach. A sparse scatter of shell material and three stone artefacts was identified across the 15m x 15m swale.
	572629	5591096		
	572613	5591099		
	572623	5591112		
AH13054	572716	5592068	Shell Midden	<p>Site is located at the northern end of Killiecrankie Bay, at the point where the sandy beach line interfaces with an extensive series of inter-tidal granite rock platforms.</p> <p>The site is situated on a the low lying fore dunes that fringe this section of the bay, and is around 30m inland (east) of the high tide mark. A very sparse and fragmented scatter of shell material was identified across an area measuring approximately 40m (north-south) x 25m (east-west).</p>
	572726	5592065		
	572742	5592096		
	572711	5592101		
AH13055	572713	5592192	Isolated artefact	<p>The site is located at the northern end of Killiecrankie Bay, at the point where the sandy beach line interfaces with an extensive series of inter-tidal granite rock platforms.</p> <p>The artefact was identified on a graded vehicle track that runs in a north-south direction, parallel to the coastline of Killiecrankie Bay. The section of track where the artefact was identified was located around 30m inland from the high tide mark, at a point where the track traverses a broad east-west trending gully.</p>
AH4148	572590	5592280	Shell midden/Artefact Scatter	<p>The site is located at the northern end of Killiecrankie bay, approximately 40m inland (east) of the high tide mark, on a low relief fore- dune that is interspersed with granite outcroppings. The coastline in this area is comprised of a series of granite rock outcroppings that extends into the inter-tidal zone, forming a series of small protected gulches.</p> <p>A sparse scatter of shell material and three stone artefacts were identified across an area measuring approximately 10m x 10m.</p>
	572590	5592280		
	572590	5592280		
	572590	5592280		

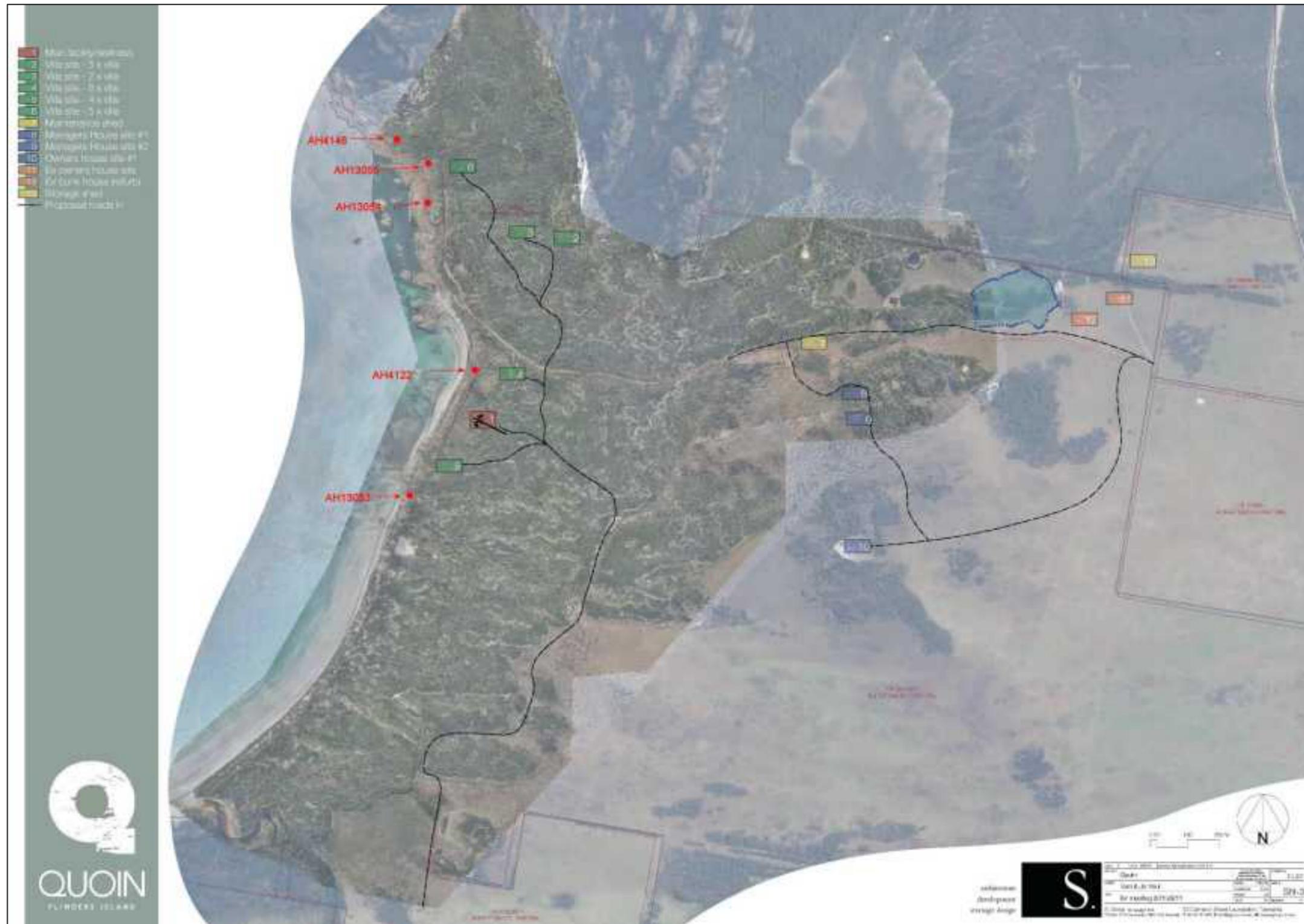


Figure i: The location of the Aboriginal sites located within the Quoin study area

### Significance Assessments

The four sites that were recorded during the field survey have each been assessed and allocated a rating of significance. A five tiered rating system has been adopted for the significance assessment; low, low-medium, medium, medium-high and high. Table ii provides the summary details for significance ratings for the two sites. A more detailed explanation for the assessment ratings are presented in section 8 of this report.

**Table ii: Summary significance ratings for Aboriginal sites identified during the survey**

Site Number	Site Type	Scientific Significance	Aesthetic Significance	Historic Significance	Social Significance
AH4148	Shell Midden/Artefact Scatter	Low-medium	Medium	N/A	Medium-high
AH13053	Shell Midden/Artefact scatter	Low-medium	Medium	N/A	Medium-high
AH13054	Shell Midden	Low-medium	Medium	N/A	Medium-high
AH13055	Isolated artefact	Low	Medium	N/A	Medium-high

### Management Recommendations

Heritage management options and recommendations provided in this report are made on the basis of the following criteria:

- Consultation and input from Vernon Graham (Aboriginal Heritage Officer);
- The legal and procedural requirements as specified in the *Aboriginal Relics Act 1975* (The ACT);
- The results of the investigation as documented in this report; and
- Background research into the extant archaeological and historic record for the study area and its surrounding regions.

Table iii provides the summary details for the site specific management recommendations developed for this project. The more detailed recommendations are presented in section 11 of this report.

### General Recommendations

- Apart from the four Aboriginal sites dealt with in the above management recommendations, no other Aboriginal features or areas of specific archaeological sensitivity were identified within the Quoin study area. There are therefore no further site or area specific management recommendations that apply to this project.
- If, during the course of the proposed eco-tourism development works, previously undetected Aboriginal heritage sites or objects are located, the processes outlined in the Unanticipated Discovery Plan should be followed (see section 12).
- Copies of this report should be submitted to Aboriginal Heritage Tasmania (AHT) and the Interim Aboriginal Heritage Council (IAHC) for review and comment.

**Table iii: Summary management recommendations for Aboriginal heritage sites located within the Quoin study area**

Site Name	Easting	Northing	Site Type	Management Recommendations
AH13053	572633	5591104	Shell midden/Artefact Scatter	Conserve site in-situ and implement management strategies to ensure that the site is not impacted by the proposed eco-tourism development. If site may be impacted by development then seek Permit.
	572629	5591096		
	572613	5591099		
	572623	5591112		
AH13054	572716	5592068	Shell Midden	Conserve site in-situ and implement management strategies to ensure that the site is not impacted by the proposed eco-tourism development. If site may be impacted by development then seek Permit.
	572726	5592065		
	572742	5592096		
	572711	5592101		
AH13055	572713	5592192	Isolated artefact	Conserve site in-situ and implement management strategies to ensure that the site is not impacted by the proposed eco-tourism development. If site may be impacted by development then seek Permit.
AH4122	572813	5591484	Shell Midden	Conserve site in-situ and implement management strategies to ensure that the site is not impacted by the proposed eco-tourism development. If site may be impacted by development then seek Permit.
AH4148	572590	5592280	Shell midden/Artefact Scatter	Conserve site in-situ and implement management strategies to ensure that the site is not impacted by the proposed eco-tourism development. If site may be impacted by development then seek Permit.
	572590	5592280		
	572590	5592280		
	572590	5592280		

## **1.0 Project Outline**

### **1.1 Project Details**

Quoin are proposing to develop an eco-tourism development on the Quoin property located at Killiecrankie Bay on the north-west coast of Flinders Island. (see Figures 1 and 2). The development will include the construction of tourist accommodation. The designs for the proposed eco-tourism development is still in the early planning phase. A general schematic plan for the proposed eco-tourism development is presented in Figure 3.

Aboriginal Heritage Tasmania (AHT) has completed a search of the Aboriginal Heritage Register (AHR) regarding the proposed Quoin Eco Tourism Development at Flinders Island and has advised that an Aboriginal heritage investigation is required to identify whether the proposed project or related infrastructure will impact on any Aboriginal heritage and to offer mitigation advice. This investigation must be undertaken jointly by a Consulting Archaeologist and Aboriginal Heritage Officer.

CHMA Pty and Ltd and Vernon Graham (AHO) have been engaged by Quoin to undertake the Aboriginal heritage assessment for the proposed Quoin Eco-tourism development. The findings of the Aboriginal heritage assessment will help inform the final design plans for the eco-tourism development. Given that the eco-tourism design is still in the early planning phase, the assessment was focused across the broader Quoin study area, as shown in Figures 1 and 2. This report presents the findings of the assessment.

### **1.2 Aims of the Investigation**

The principal aims of the present Aboriginal heritage assessment are as follow.

- To determine the extent of previously identified Aboriginal heritage sites within the study area.
- To locate and document Aboriginal heritage sites or features that may be present within the identified bounds of the study area.
- To assess the archaeological sensitivity values of the study area.
- To assess the scientific and Aboriginal cultural values of identified Aboriginal heritage sites.
- To develop a detailed set of management strategies which are aimed at minimising the impacts of the proposed eco-tourism development on the Aboriginal heritage resources in the study area.

### **1.3 Limitations of the Investigation**

All archaeological investigations are subject to limitations that may affect the reliability of the results. The main constraint to the present investigation was restricted surface visibility due primarily to vegetation cover, and imported gravels in some discrete locations. Surface visibility across the study area was estimated to average around 30%, with the occasional graded vehicle track, walking tracks and erosion scalds providing discreet locales of improved visibility. The constraints in surface visibility has limited the effectiveness of the field survey. The issue of surface visibility is further discussed in Section 6 of this report.

#### **1.4 Project Methodology**

The Aboriginal heritage assessment for the Quoin Eco-Tourism Development proposal has been undertaken in three stages:

##### ***Stage 1 (Pre-Fieldwork Background Work)***

Prior to field work being undertaken, the following tasks were completed by Stuart Huys (CHMA archaeologist).

##### *Consultation with Aboriginal Heritage Tasmania (AHT)*

Aboriginal Heritage Tasmania (AHT) was contacted and informed that a field survey was to be undertaken for the Quoin study area. As part of this initial contact, a search request of the Aboriginal Heritage Register (AHR) was also submitted to AHT in order to ascertain the presence of any previously registered sites in the vicinity of the study area.

##### *Consultation with Vernon Graham (Aboriginal Heritage Officer)*

Vernon Graham is the designated Aboriginal Heritage Officer for the present investigations. As part of Stage 1 works Stuart Huys (CHMA archaeologist) and Vernon Graham were in regular contact. The main purpose of this contact was to discuss the scope of the present investigations, to ratify the proposed methodology for the investigations and to co-ordinate the timeframes for implementing field work.

##### *The collation of relevant documentation for the Project*

The following documentation was collated for this project.

- A review of the relevant heritage registers (AHR) and the collation of information pertaining to any registered heritage sites located within the general vicinity of the study area.
- Maps of the study areas;
- Relevant reports documenting the outcomes of previous Aboriginal heritage studies in the vicinity of the study area;
- Ethno-historic literature for the region;
- References to the land use history of the study area;
- GIS Information relating to landscape units present in the study area;
- Geotechnical information for the study area, including soil and geology data.

##### ***Stage 2 (Field Survey)***

Stage 2 entailed the fieldwork component of the assessment. The field survey was undertaken over a period of three days (8-4-2015 to 10-4-2015) by Stuart Huys (CHMA archaeologist) and Vernon Graham (Aboriginal Heritage Officer). In total, 21.4km of transects were walked within and in the immediate surrounds of the Quoin study area, with each transect averaging 10m in width. In the course of the field assessment, any areas of improved surface visibility (such as vehicle tracks, walking tracks and erosion areas) were subject to a detailed inspection.

Whilst the field survey was focused across a broad area of the Quoin property, specific attention was paid to the proposed location of the eco-tourism facilities, with additional

transects walked in these areas. Section 6 provides further details as to the survey coverage achieved within the study area.

The results of the field investigation were discussed by Vernon Graham and Stuart Huys. This included the potential cultural and archaeological sensitivity of the study area, and possible management options.

***Stage 3 (Report Preparation)***

Stage three of the project involved the production of a Draft and Final Report which includes an analysis of the data obtained from the Stage 2 field work program and the development of heritage management recommendations. The report was prepared by Stuart Huys (CHMA) in liaison with Vernon Graham (Aboriginal Heritage Officer).



Plate 1: Vernon Graham, the Aboriginal Heritage Officer for this project

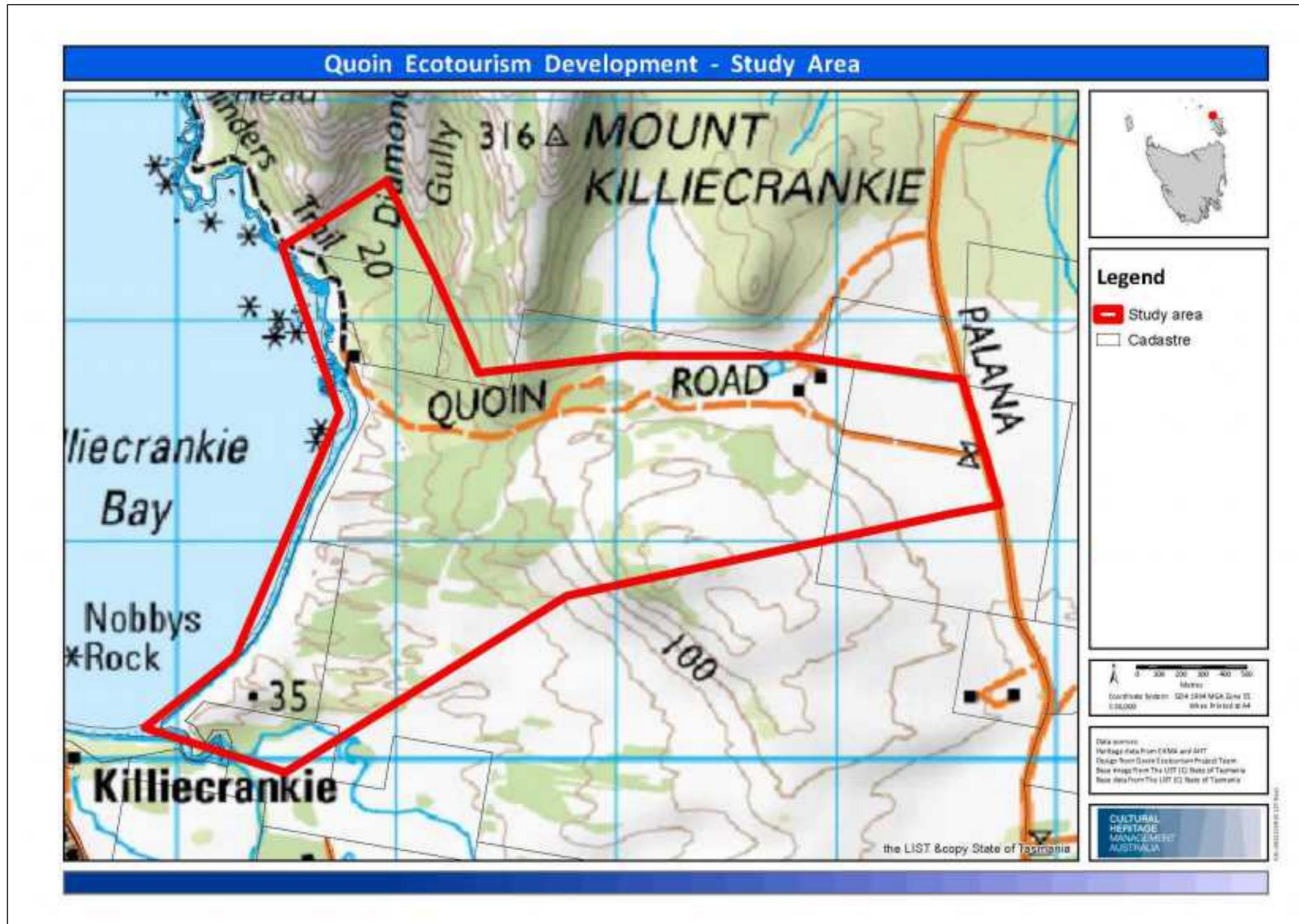


Figure 1: The boundaries of the Quoin study area

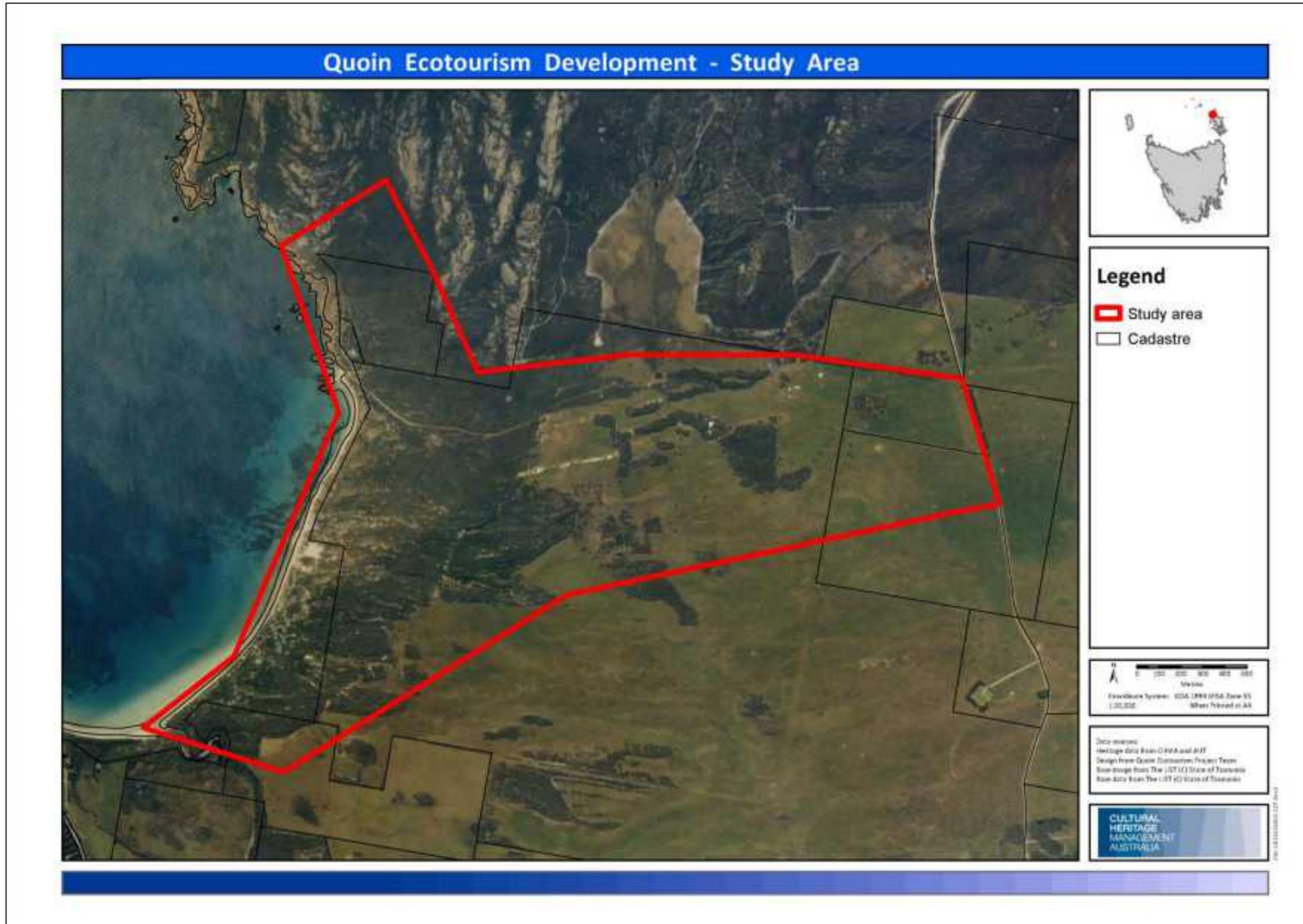


Figure 2: Aerial image showing the boundaries of the Quoin study area



Figure 3: Preliminary concept designs for the proposed eco-tourism development

## 2.0 Environmental Setting

The islands of the Bass Strait are confined to two rises on the east and west, with the deepest waters of the strait lying in the centre. The eastern margin of the Bass Strait contains a chain of mountainous granitic islands which stretch from Wilsons Promontory in Victoria to north eastern Tasmania. The current study area is situated on Flinders Island; one of three major islands which make up the Furneaux Group of islands, which also includes a great number of lesser islands. The Furneaux Group is situated at the eastern entrance of the Bass Strait to the north east of Tasmania. Flinders Island is the largest island in the group, measuring about 62 km from north to south, and 37km from east to west, with a total land area of 1,333 km<sup>2</sup>. The island is mountainous and rugged with ridges of granite running the length of the island, separating a narrow western and broad eastern coastal plain (Hope 1973).

### 2.1 Climate

Flinders Island has a mild oceanic climate. Rainfall is described as moderate, with the summers being drier than the winters with the total annual average of the rainy days not reaching 800 mm. Generally the climate is mild and equable with the only distinguishing feature being strong westerly winds at certain times of the year. Snow falls at higher altitudes without accumulating and is unknown along the lower lying coastal plains (Blake 1947; Hope 1973; Bureau of Meteorology 2015).

### 2.2 Physiography

Flinders Island is relatively long and narrow, having a general direction from north, north-west to south, south east. Physiographically the island consists of granitic peaks and ridges above low angle slopes of colluvium and windblown material. Flat sand plains, bound by beach ridges and swales are situated below these slopes and hills (Ladd *et al.* 1992).

Topographically the land varies from that of very high relief to low relief. The areas of high relief are situated within the central, south western and north western areas of the island. The study area is situated within the high country of the north western portion of the island which is defined by the Killiecrankie Range, from Cape Frankland to North Point. It includes Mount Tanner, The Paps, Mount Blyth, Quoin and Mount Killiecrankie, which is situated to the immediate north of the study area (Blake 1947.) The areas of low relief are restricted to the western and eastern coastal belts. These two main plains systems appear to have formed under marine conditions. Both are comprised of unconsolidated sands, loosely compacted sandstone and arenaceous limestone containing marine shell. The western coastal plain extends into the current study area at Killiecrankie Bay. The plain represents a generally flat surface with a slight fall from the edge of the coastal hills to sea level (Blake 1947).

The Quoin study area borders onto Killiecrankie Bay. The majority of the shoreline along Killiecrankie Bay is a sandy beach shoreline. On the southern and northern ends of the Bay, the sandy shoreline interfaces with granite bedrock (see Plate 2). This bedrock forms a series of rock platform and sheltered gulches. The rock platforms host a wide range of shell fish species, as well as crayfish and other marine resources.

The topography of the study area, where it borders Killiecrankie Bay, comprises a series of sand dune deposits that are interspersed by deep swales. These dunes rise to a height of around 30m asl, and extend up to 1km inland from the beach (see Plate 3). These dunes are largely stabilised by coastal vegetation, however, there is still some degree of dune mobility, with the less vegetated dune deposits being shifted by wind erosion. To the east of the dune systems, the terrain is characteristically gently undulating, comprising a series of low relief hills and small valley systems (see Plate 4). The north of the study area is flanked by the steep granitic western slopes of Mount Killiecrankie. The granite outcrops on these western slopes form a number of distinctive overhang features (see Plate 5).

Flinders Island does not contain a large drainage system; instead the general drainage pattern is of short shallow streams which drain from the mountains and hills directly to the coastline. In the north western region of the island where the study area is situated, Pratts Rivulet originates in the form of several heads at Mount Killiecrankie and Mount Blythe, where after combining, it flows north westerly to the coastline at Palana. Killiecrankie Creek originates at Mounts Tanner and Blythe and flows north westerly, where it empties into the southern end of Killiecrankie Bay (see Plate 6), while another creek originates at Mount Boyes and flows south into Tanner Bay (Blake 1947:57-58).



Plate 2: View north along the northern section of Killiecrankie Bay where the sandy shoreline interfaces with granite rock platforms



Plate 3: View north along the dune systems bordering Killiecrankie Bay. Mount Killiecrankie is in the background



Plate 4: View west across the gently undulating hills within the eastern portion of the study area



Plate 5: Granite overhang located on the steep west hill slopes of Mt Killiecrankie



Plate 6: View east at the mouth of Killiecrankie Creek where it enters into the southern end of Killiecrankie Bay

### **2.3 Geology and Geomorphology**

Flinders Island consists of a mountainous Palaeozoic basement ridge, flanked by coastal plains built mostly of Cainozoic sediments and minor lavas. Sea level fluctuations have played an important role in coastal dune formation and in developing coastal marine erosional and depositional features (Kershaw and Sutherland 1972:1).

The oldest rocks in the Furneaux Group are the closely folded Silurian slates and quartzites of the Mathina Series. These rocks were originally geosynclinal deposits of sand and mud, accumulating in fairly deep water on a continental shelf. These beds were then elevated and folded by orogeny during Devonian times. At the same time these rocks were injected and re-injected with granitic magma. These intrusive Devonian granites form an extension of the north eastern Tasmanian batholith. During this time basaltic dyke formation also occurred. Following elevation and granitic and basalt intrusions was a long period of erosion (Blake 1947; Sutherland 1973).

The basement rocks of the Silurian and Devonian describe the geology of pre Bassian Plain formation. During the Upper Jurassic period rifting along the Ottway Rift Valley initiated the tectonic activity from which the Bass Basin originated. Strong north-west rifting started the formation of the Bass Basin, and by the mid-Cretaceous widespread faulting and subsidence had formed the Bass Basin. Closed off from the ocean by ridges linking King Island and Flinders Island to mainland Australia, the Bass Basin became gradually filled with sedimentary deposits of millions of years of erosion, with grits, sands, sandstone, and shales brought down by the rivers.

Tectonic earth movements during the Mesozoic/Cainozoic created the north-west orientation and alignment of the islands major geological and topographic features. Highland and Island group trends of the Bassian Rise suggest elevated fault blocks formed as a result of the north-west fault movements. Flinders topography suggests fault blocks mostly with south westerly facing scarps and downwards tilts to the north east (Everard 1950; Kershaw and Sutherland 1972:5).

On Flinders Island, Tertiary age gravel, sand and limestone lie directly on top of the Silurian and Devonian age rocks. The former deposits cover the greater area of Flinders Island; that which is not taken up by outcrops of granite and Silurian rocks. Marine transgression during the Miocene along the southern margin of Australia flooded the Bass Basin and initiated the deposition of gravel, sand and limestone deposits. Submergence was gradual however, with many periods of regression. The sedimentary beds of sand and gravel indicate shallow water deposition, while in other areas deposits of limestone indicate deep water deposition. Interbedded with the sands, gravels and limestones are basaltic dykes; also of Tertiary age (Everard 1950).

The Tasmanian side of the Bass Strait subsequently remained quite passive, without any significant tectonism and faulting occurring since late Tertiary times. The geological history of the coastline from this point in time is characterised by glacio-eustatic sea level fluctuations combined with periods of extensive sand dune building. Dune building dates back to the early Pleistocene during periods of glaciation and lower sea levels. Regionally,

dune series tend to be calcareous on westerly and northerly facing shores and siliceous on southerly and easterly facing shores. This is particularly evident on the larger of the Bass islands such as Flinders Island. The parabolic orientation of the dune systems, are consistent with the wind directions of the present regimes (Everard 1950; Sutherland 1973).

Marine regressions associated with periods of glaciation extended dune building and drainage outlets well beyond and below current sea levels. At Killiecrankie Bay drowned calcareous dune systems are today evident as sea stacks (Kershaw and Sutherland 1972). The lowering of the sea level was sufficient to link Victoria with Flinders Island and Tasmania. This allowed faunal migrations during periods of lower sea level and subsequent periods of faunal isolation during periods of sea level rise. The last post-glacial sea level rise (18,000 to 6000 years ago) isolated Tasmania and the Bass islands, 15,000 to 11,000 years ago, finally drowning the coast to its present level. The most recent geological deposition on Flinders Island is that of alluvium deposited by stream action and windblown sand deposition along the coast lines (Everard 1950; Sutherland 1973).

The geology of the study area is primarily that of the western coastal plains system, with Quaternary coastal sand, gravel, and limestone deposits. Killiecrankie Bay is typified by coastal beach deposits and calcareous dune systems, ridges and flats. Devonian granitic hills, ridges and mountains are situated in the north and to the south of the study area, as typified by Mount Killiecrankie (see Figure 4 and Plate 7).

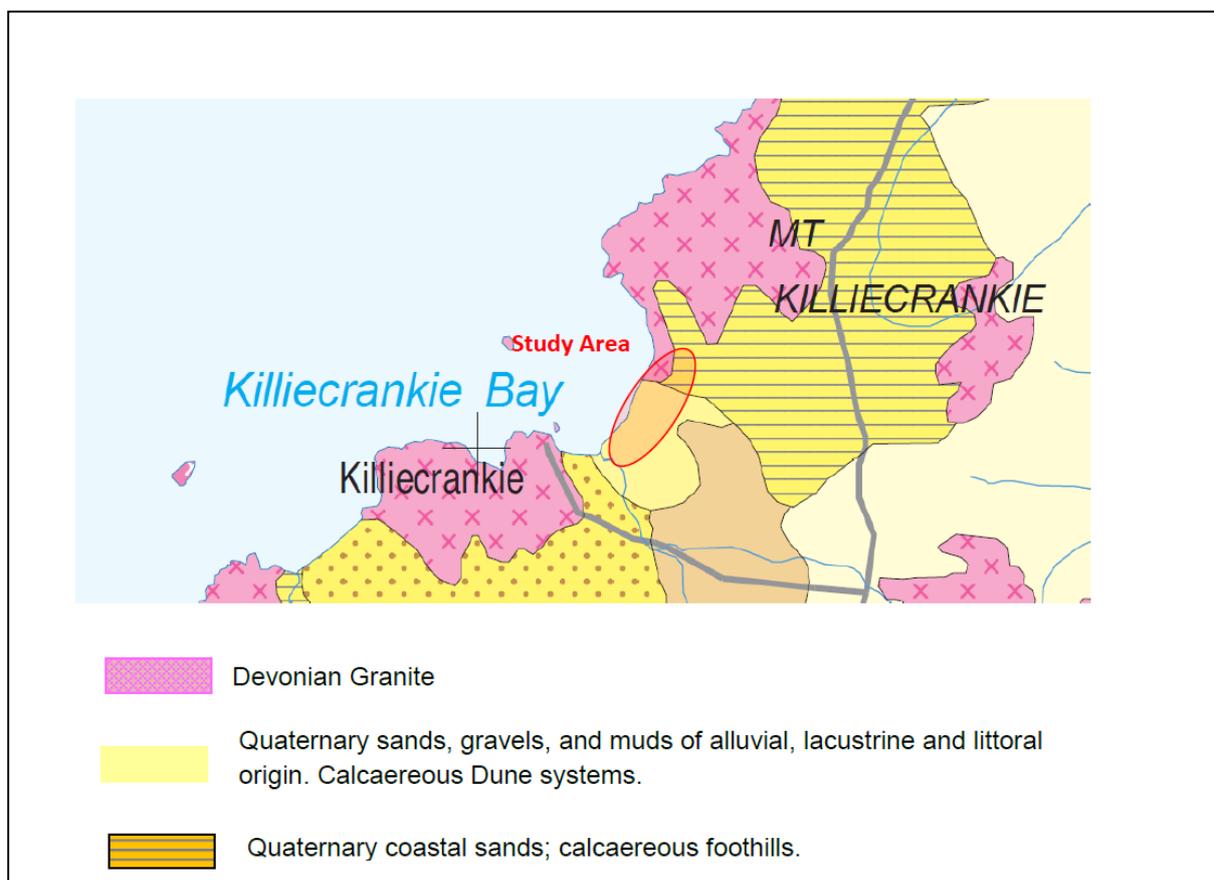
Kershaw and Sutherland (1972) summarise the Quaternary geomorphology of Flinders Island, specifically the geomorphology of the coastal plains and the history of dune building on the island. From oldest to youngest the dune series described are, aeolian calcarenite, aeolianites, unconsolidated parabolic dunes, and modern beach ridge and frontal dunes. Situated within the region of the wider study area, are aeolian calcarenite dunes, identified as the Palana limestone dunes. At the time of initial glacial sea retreat, extensive areas of Tertiary limestone, specifically calcarenite, were exposed, providing an abundant calcareous source. In this instance, dune building follows a repeating pattern of episodes of construction during still stands of sea level fluctuations, parabolic reorientation during periods of storminess and erosion and drowning during marine transgressions (Sutherland 1973; Kershaw and Sutherland 1972).

Initially the sediment of the calcareous dunes was sandy with an increase in carbonate with depth. Over time the sand dunes became consolidated with the development of deep soil profiles. A part of this process is induration and cementation of the calcareous soil B horizons, which resulted in the formation of limestone. Considerable depths of this limestone, or aeolian calcarenite, occur in some areas, such as at Killiecrankie Bay, with a 20 foot thick arch of limestone showing aeolian bedding (Kershaw and Sutherland 1972:6). Plate 8 shows an example of the aeolian calcarenite outcropping along the shoreline of Killiecrankie Bay.

Subsequent erosion exposed the limestone, on which then formed red-brown soils. These red brown soils are widespread on the western coastal plain and often contain limestone boulders. The red brown soil association with the Palana limestone has been described by

Dimmock (1957), cited in Kershaw and Sutherland (1972), as the Ranga association. Kershaw and Sutherland (1972), place the Palana limestone dune formation as Pleistocene in age or older. Caverns, caves and sink holes have also developed in the limestone in the vicinity of the study area owing to water erosion.

Unconsolidated parabolic dunes are also found in the vicinity of the study area. These dune systems are argued to have their origin in the Late Glacial to early Holocene period. Within the study area the parabolic dunes are identified as the Lughrata sand dunes and are comprised of loose to semi-consolidated grey sand. These dunes are at least in part older than the fore dunes of the Lackrana Sand, also situated within the region of the study area. The later system, comprising of modern beach ridge and frontal dunes, date to the Holocene period. The Lackrana sand dunes display little to no soil horizon development.



**Figure 4: Geology of the study area (Map adapted from Geology of North East Tasmania Scale 1:250,000)**



Plate 7: The granite outcrops on Mount Killiecrankie



Plate 8: An example of the calcarenite limestone outcropping along the shoreline of Killiecrankie Bay

## 2.4 Soil Landscapes

Soils of the study area and the wider Flinders Island district have been mapped by Dimmock (1957). Three soil landscape associations may be identified within the coastal plains unit in the vicinity of the study area. Namely, the red brown and brown soils of the Ranga and Lughrata associations, both of which derive respectively from the calcareous Palana limestone and parabolic dune systems described above. The more recent Lackrana association is derived from the recent beach ridge and frontal dunes in the study area. Soil landscape mapping undertaken by Pinkard and Richley (1982), groups these three soil associations into a single soil landscape identified as the Marshal Bay soil landscape (see Figure 5).

Undifferentiated yellow calcareous sandy soils are identified on the more recent beach deposits (Lackrana), with brownish yellow sandy soils of a uniform soil texture class typifying the parabolic coastal dune systems (Lughrata). Beach ridge deposits and swales of the older limestone sand dunes display reddish brown clay loam duplex soils, and red gradational clay loams, respectively (Pinkard and Richley 1982:54-55).

Some areas of the northern extent of the study area may extend into the Devonian granitic terrain of Mount Killiecrankie. Dimmock (1957, cited in Pryor 1967), describes four soil associations for the granitic mountains and foothills of Flinders Island. The Carena association describes the mainly bare and skeletal soils of the steep granitic mountains, while the Emita and Quoin associations describe the soils of the granitic foothills in the north west of Flinders Island. The Metta association consists of soils formed on the valley floors, predominantly derived from granitic colluvium. The four soil associations described above, have been mapped in the vicinity of the current study area by Pinkard and Richley (1982), and are collectively identified by them as the Darling-Tanner soil landscape (see Figure 5).

In this instance, gravelly sandy loam duplex soils with cemented A2 horizons are encountered along the crests and steep upper slopes of Mount Killiecrankie. These soils may be mottled light grey to yellowish brown in colour. Mottled strong brown to grey gradational soils with gravelly clay loam top soils are found along the mid slope areas, while mottled pale brown to yellowish brown duplex soils with gravelly sandy loam top soils are situated along the lower granitic slopes. Mottled light grey to reddish yellow duplex soils with sandy loam top soils are situated along the gentle lower slopes formed from granitic colluvial deposits (Pinkard and Richley 1982:30-31).



**Figure 5: Soil landscapes of the study area.**

**Map adapted from Pinckard and Richley (1982), Scale 1:200,000**

## 2.5 Vegetation and Landscape Use

Vegetation on Flinders Island varies from rainforest scrubland found in the valley gorges of the steep granite hills, through to scrub and heath land and slatmarshes along the lower lying coastal plains. *Eucalyptus globulus* is widespread on the island and is the dominant of the tallest forests found along steep mountain terrain. *E. globulus* is commonly associated with *E. viminalis* in more sheltered mountain valleys. Dry eucalypt forest and woodland communities dominated by *E. nitida* integrate with heath and scrub communities which lack trees. This complex of low forest and scrubland is the most widespread vegetation community across the island. Along the coastal dune sands of the island, coastal scrub land is dominated by *Leptospermum*, *Acacia* and *Leucopogon*, while exposed headlands support

communities of grasslands and *Casuarina* and *Allocasuarina* forest communities. Heathlands are also common and range from wet heathlands dominated by *Melaluca* to dry heathland which supports understoreys of grass trees. Shallow swamps populated with monocotyledons and aquatics are frequent on the island, where depressions in jumbled dunes accumulate with ground water (Ladd *et al.* 1992:759-760).

Several vegetation communities are present across the wider study area (see Figure 6). Coastal scrub and heathlands are found across the Killiecrankie Bay area, along the coastal dunes and calcareous foothills. Tall *E. Globulus* and *E. Viminalis* forest is found in the gullies of Mount Killiecrankie, with *E.nitada* coast and scrub communities situated further up slope. Wet *Melaluca* scrubland is found in the more protected areas of Mount Killiecrankie, while *Allocasuarina* forest and *Leptospermum* scrub land are found along the more exposed areas and headlands (LIST Database accessed 16.04.2015). Swamp lands are present in the wider area, with Killiecrankie swamp situated to the south of Killiecrankie Bay.

The Quoin study area is an operating cattle farm. As part of farming operations, much of the inland parts of the study area, to the east of the coastal dunes has been selectively cleared of native vegetation and re-planted with introduced grasses. The cleared areas have been fenced into a series of farm paddocks. A homestead and series of outbuildings has been constructed on the property, as well as a set of cattle yards (see Plate 9). These are allocated in the eastern portion of the study area, close to Palana Road. A network of graded vehicle tracks have been constructed through the property. The main access road extends from Palana Road, west through to Killiecrankie Bay (see Plate 10).

Besides the selective land clearing and the establishment of farm dwellings and infrastructure, the Quoin study area has undergone little land disturbance. The vegetation structures along the coastal dune systems, and the flanks of Mount Killiecrankie are still largely intact (see Plate 11).



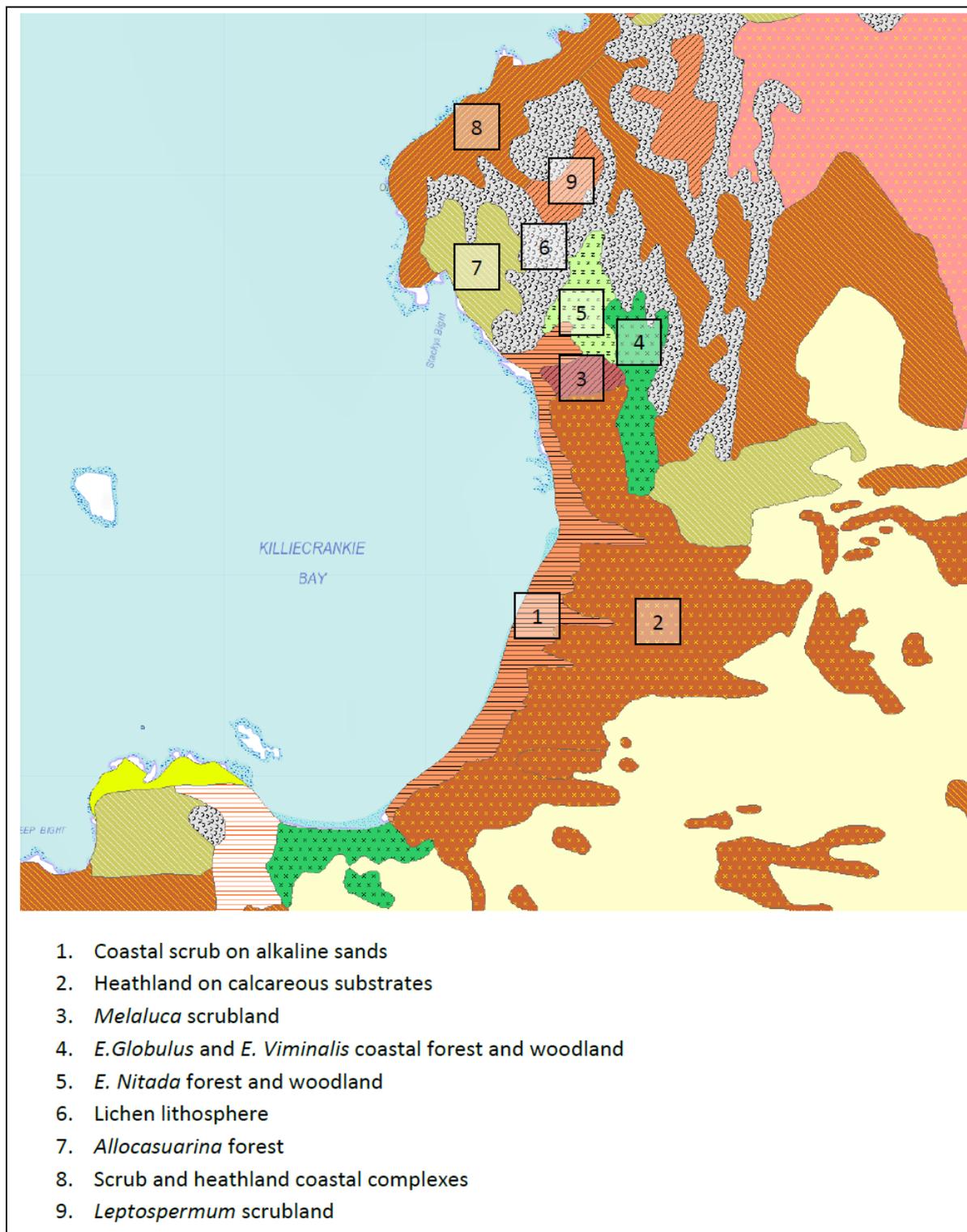
Plate 9: View north-east across cleared areas on the Quoin property, looking towards the main homestead complex



Plate 10: View west along the main graded vehicle track that runs through the Quoin property



Plate 11: View south across the dune systems in the Quoin study area, with the largely intact coastal vegetation structure



**Figure 6: Vegetation of the study area. Map adapted from LIST (accessed 16.04.2015)**

## 3.0 Ethno-historic Background

### 3.1 Overview of Aboriginal Social Structures

The following provides a brief overview of the nature of pre-contact Aboriginal groupings, Aboriginal concepts of land ownership, and the relationship of both these to Aboriginal land use in Australia. The purpose is to establish a basic framework of understanding regarding Aboriginal social organisation, within which the archaeology of the study area may be viewed. The overview presented here reveals the complexities of Aboriginal societies across Australia. It indicates the interrelated nature of the environment, religion and social structure in pre-contact Aboriginal societies and has implications for discussions of the archaeological record.

The model of Aboriginal society divided into a series of tribes, based on Tindale's 1974 is considered by contemporary anthropologists as largely defunct. However, this model permeates concepts of Australian Aboriginal social organisation and warrants a brief discussion.

The tribe is described by early anthropologists as having rights over a defined tract of land, that included control over entry to people from outside and the right to hunt and extract resources from within the bounds of that area (Keen 2010:46). Several researchers have argued that this concept does not account for the complexities of social interaction and organisation found in Aboriginal society (eg. Keen 2004). There has recently been a shift to attempts to describe Aboriginal society as multi layered and to explore the interconnected relationships that operated within broad social groups.

It is the band that is generally considered by anthropologists as the basic social and economic unit in Australian Aboriginal society (Peterson 1976). The band is defined as a small scale population, comprised of between two to six extended family units, or about 14 – 33 people who cooperate in the food quest (Keen 2004:106). The composition of this group (in terms of numbers) was not rigid; group size fluctuated in response to factors such as the availability of resources and visiting kin (Peterson 1975).

Individual bands are seen to occupy and exploit a specific range (Keen 2004:106). The concept of a band's 'range' is not easily defined, and is therefore somewhat problematical to delineate. The ideal method of defining range would be to identify the outermost points of an area used by a group in order to demonstrate the total area, or range, in which that band operated. Yet, as Peterson (1986) points out, the kind of evidence needed to achieve this, (details of daily movements over several years) is not available for any group within Australia. Nor is such evidence likely to be discernible in the archaeological record. The practical alternative, both from an archaeological and an anthropological perspective, is to identify the base camps used over a period of time by a group. This provides a rough equivalent of a band's range.

Bands were not socially or culturally isolate, but rather interacted with each other in a variety of ways. Typically, these interactions involved visitations, marriage, ceremonies and trade. Through these interactions, links were established or re-affirmed between neighbouring

bands. The result was the formation of a cluster of bands, wherein there was some sense of collective identity, often expressed in terms of possessing a common and distinctive language (White & Cane 1986). It is these groups of interrelated bands that form the basic understanding of the 'tribe', but which are perhaps more usefully considered as broad social groups with loose geographical and cultural affiliations.

Keen (2004:135) argues that a shared language did not necessarily indicate shared cosmic beliefs or social customs, nor did language or dialect clearly define social groups. Linguistic inheritance could be multi-layered. Trigger (1992:104) records how in some northern Australian societies most people were (a) multi-lingual and (b) adopted a primary linguistic label based on whether their present circumstances were aligned. This implies that linguistic affiliation was perhaps a less formal and more adaptive social mechanism. Trigger (1992:105) suggests that this undermines the concept of linguistic groups, which was a characteristic often used in the past to define 'tribes'.

Interestingly, Keen (2004:170) suggests that group identity was 'most clearly defined' in areas rich in resources, such as coastal zones, while people in more arid environments had less strongly applied rules governing identify. This reflects the imperative for desert people to be on solid relationships with their neighbours, to ensure economic support when resources were low. The following section discusses issues of Aboriginal connection to the land in more detail.

### **3.2 Environmental Determinants of Social Organisation**

In cultures across the world it is impossible to separate natural landscapes from cultural landscapes (White 2003:188). From an archaeological perspective, it is equally impossible to discuss economy and subsistence without reference to the environment.

As Sutton (2008:170) explains, WEH Stanner explored the connectedness of economy, environment and spirituality over forty years ago. This has come to the fore in contemporary anthropology. Stanner's famous paper 'Aboriginal territorial organisation: estate, range, domain and regime' published in *Oceania* in 1965 was a benchmark as it provided a new framework within which to define and discuss Aboriginal land ownership (Peterson 2008:185). This framework separated concepts of land ownership from the land that people actually used. Peterson (2008:185) suggests that this was a fundamental shift that has influenced the last forty years of anthropological debate.

In coastal and riverine environments where a higher population densities could be supported compared to desert environments, people could lead more sedentary lives (Keen 2004:103). In these situations the social organisation of neighbouring groups could become more individualised; whereas in more arid climates people relied on being able to traverse vast tracts of land to access food and water, requiring closer social relations with neighbouring people (Keen 2004:103).

This argument reflects Louis Binford's model of 'foragers' and 'collector' societies. Foragers are highly mobile groups that move regularly and as a whole to new locations on order to exploit resources. In contrast, collector societies may move less often but rely on individual

members of a society venturing out beyond the camp site location in order to provide the group with resources to continue residing at the location (Keen 2004:104). Keen (2004:104) suggests that most Australian Aboriginal societies fall within Binford's 'collectors' model: forming home bases and voyaging out from these bases to exploit resources from the surrounding area, which could be very large.

It was economically vital for Aboriginal people to be organised into bands, as this made groups more effective at surviving. Subsistence is more efficient and reliable if people are organised into groups that are larger than the nuclear family. This increases the number of 'producers' (people who can actively provide food for a group) and acts as a buffer against the sickness, injury or death of any one individual (Keen 2004:105). However, these groups could never become too large, as increased numbers reduce the mobility level of the band, as well as potentially leading to broader social disintegration (Keen 2004:106).

The range of a band had to be capable of providing for the survival of the group for much of the year Keen (2004) takes an economic view of range and presents a case for the range of a group to be determined by access to preferred food resources. As Keen argues, availability of foods, food preferences, production techniques and methods of transport all affect the means by which Aboriginal people across Australia were able to access food resources at varying times of the year. These factors therefore greatly affected mobility; groups had to be able to mobilise and move to where the preferred, available and accessible foods were located (Keen 2004:23).

The factors that influence selection of a 'home base' are varied and illustrate the nature of pre-contact Aboriginal societies. Access to fresh water is probably the most fundamental requirement, and will be common to all home base sites. Distance to food resources is the next consideration. As Keen (2004:104) notes, it may be that home sites are better located adjacent to less transportable resources, rather than in areas where there is the highest *abundance* of food. The distance that an individual collector can travel within a single day forms an important scope of the range of the home base, and therefore the size of the resource pool available. Keen (2004:104) suggests that in hunter gatherer societies around the world, a distance of 20-30km is considered the maximum foraging distance from a home base. People could then establish smaller temporary camps away from the central home site to enable longer foraging journeys (Keen 2004:105).

Despite the difficulties faced in defining ranges, Peterson (1986) believes there is good evidence for supposing that bands are localised and generally have bounded and exclusive ranges. The most significant evidence is ethnographic accounts recording the elaborate rites of entry accorded to visitors when entering a band's range (see Peterson 1986). However, there is no evidence to suggest that members of a band actively defended the boundaries of these ranges (Peterson 1986). Rather, it appears that the boundaries of a group's 'range' were not necessarily clearly demarcated lines. Trigger describes these overlapping boundaries as 'zones of transition' (Trigger 2010:155).

Ancestral law was the defining principle that controlled access to country and landmarks, including water sources (Keen 2004:299). Tied to this notion are concepts of cosmology,

religion and the ongoing influence of the ancestors (Keen 2004:303). Keen suggests that: 'ancestral significance integrated country, resources and technologies into the all-encompassing framework of ancestral law, not only as a mode of control, but as a way of being.' (Keen 2004:303). Myers has also argued that ownership of territory was largely vested in knowledge of the 'stories, objects, and ritual associated with the mythological ancestors of the Dreaming at a particular place (in Peterson 2008:192).

### **3.3 Aboriginal Social Organisation in Tasmania**

Despite difficulties with the concept of the tribe as the basis of understanding pre-contact Aboriginal society outlined above, it is a useful term to describe the broadly grouped people who occupied a certain geographical area. In Tasmania, the most comprehensive account of pre-contact Aboriginal society is provided by Ryan (1996). Ryan uses the term tribe in a largely geographical sense, and that is the position adopted in the following discussion. In this way, 'tribe' is not intended to reflect a lack of social dynamism or a defined social institution.

According to Ryan (Ryan 1996:14), the Aboriginal population of Tasmania was aligned within a broad framework of nine tribal groups, each comprising between six to fifteen bands. The mean population of each group is estimated to have been between 350 and 470 people, with overall population estimates being in the order of between three to five thousand people prior to European occupation (Ryan 1996:14).

Jones (1974) suggests that the social organisation of Tasmanian Aboriginal society appears to have consisted of three social units, these being the hearth group, the band and the tribe. The hearth group was the basic family unit and would generally have consisted of a man and woman, their children, aged relatives and sometimes friends and other relatives. The size of hearth groups would generally range from between 2-8 individuals (Jones 1974; Plomley 1983). Plomley (1983) provides a description made by Peron of a hearth group he encountered at Port Cygnet:

*There were nine individuals in this family, and clearly they represented a hearth group, because Peron visited their campsite with its single hut. The group comprised an older man and wife, a younger man and wife, and five children, one a daughter (Oure-Oure) of the older man and wife, and the other four the children of the younger man and wife. (Plomley 1983:168)*

The band comprised a number of hearth groups (Jones 1974). Whilst the band often resided within its own territory, it also foraged widely within the territories of other bands. Brown (1986:21) states that the band was led by a man, usually older than the others and who had a reputation as a formidable hunter and fighter. Brown (1985) also suggests that the band (as well as the hearth group) was ideally exogamous, with the wife usually moving to her husband's band and hearth group.

It appears that there were two broad language groups in Tasmania, the northern and southern Tasmanian languages (Ryan 1996). Labilliarere recorded a vocabulary of 120

words that is probably the best source for the language of the south east people (AT 2010:24).

### **3.4 Aboriginal Social Organisation on Flinders Island**

The Aboriginal social organisation on Flinders Island is poorly understood. There is archaeological evidence that the Island was occupied during the Pleistocene, when Flinders Island was connected to Tasmania (see Sim 1990 and 1991), however, we are uncertain of the Aboriginal social structure of Tasmania at this time.

There is also definitive archaeological evidence to show that Aboriginal people continued to occupy the area during the Holocene period, once the Island was formed (see Sim 1990 and 1991). The general consensus in the archaeological literature is that Aboriginal Holocene populations were essentially stranded on Flinders Island by rising sea levels. However, there is no archaeological evidence to date, that attests to the occupation of the Furneaux Group of islands from c4500 to c250 years ago (Sim 1994; Bowdler 2014).

Earliest European observations of the more remote islands of Bass Strait, such as the Furneaux Group and King Island occurred towards the end of the 18<sup>th</sup> century. At the time, each of these islands was recorded as being devoid of human inhabitants (Baudin 1803; Flinders 1801, 1814; Peron cited in Micco 1971; Cumpston 1973:44-45).

Flinders noted that while there were constant Aboriginal 'smokes' being sighted around Tasmania, there was 'none upon the islands' (Flinders 1814:cxxxvi in Sim 1991). The first European visitors supported these observations, by failing to find shell middens or any other evidence to suggest previous occupation by Aboriginal people (Sim 1991). Given the richness of food resources available on the larger islands throughout the Bass Strait, Flinders found the lack of Aboriginal inhabitants on the islands puzzling.

### **3.5 Ethno-historic Overview**

Aboriginal people returned to the Bass Strait Islands in two groups between c1800 and 1836. Initial occupation of the Furneaux group of islands began with the sealers of European descent and the Aboriginal women who came with them, both forcibly and voluntarily. Soon after the settlement of the colony at New South Wales in 1788, the sealing grounds of Bass Strait were discovered. A subsequent rush of sealers flowed into the region eager to exploit this valuable resource, such that, by 1810 sealing had become uneconomic and by 1827 the seal populations had been virtually exterminated (Edgecombe 1992; Skira 1997).

Those sealers who stayed on, along with their Aboriginal 'wives' and the next generation of Aboriginal children born to them, became known as the Straitsmen. They lived of the sea and land, yet also made a living by bartering seal and wallaby skins, mutton bird and other items of produce to passing ships in exchange for spirits and other items. By the mid nineteenth century the Furneaux Group of Islands had an established self contained Aboriginal community. Descendants of this Aboriginal community live on Cape Barren Island to this day (Edgecombe 1992; Skira 1997).

The second group of Aboriginal people to arrive on the Furneaux Islands were those that had been rounded and gathered up by George Augustus Robinson. Hostilities on the mainland of Tasmania had deteriorated to a state of undeclared war and in 1828 George Arthur, Governor of Van Diemen's Land, declared martial law, which simply led to further violence between the Aboriginal people and the settlers. The notorious black line of 1830 was a movement intended to remove the Aborigines from the settled districts of Tasmania. Military and police forces, along with European settlers swept Tasmania from north to south towards the Tasman Peninsula, which was designated by Arthur as an Aboriginal reserve. While the black line did little to actually catch any of the Aborigines, estimates by Ryan (2012, cited in Bowdler *in press*:9) suggest that by 1834 hostilities and fighting had led to the outright killing of 60% of Aboriginal people in the settled districts.

The government realising that something had to be done to prevent the extermination of the Tasmanian Aborigines, appointed Robinson to run a ration station for the conquered Aborigines of the settled district at Bruny Island. With continued fighting and violence between the settlers and Aborigines outside the settled district, Robinson was given permission to go out and persuade and coerce the remaining Aboriginal people to give up the fight (Bowdler *in press*:9).

Robinson's missions into the interior of Tasmania between 1827 and 1832 had persuaded virtually all the surviving Aborigines to join him and leave their traditional homelands. After a short period at Bruny Island, and several temporary encampments, the group of over 100 Tasmanian Aborigines, British officers and assorted naval and military personnel were established in a settlement on Flinders Island. The party encamped for two years at a southerly site on Flinders Island, identified as the Lagoons site, before making the move to Settlement Point in 1833 (Birmingham 1992:23,25). This settlement, now known as Wybalenna was situated on the north east coast of Flinders Island, some distance to the south of the current study area at Killiecrankie Bay.

Bowdler (*in press*, citing Ryan 2012) explains how at each settlement, it is evident that Aboriginal people tried to maintain a meaningful relationship with the land and to maintain their identities. Many Nations were represented on Flinders Island and three distinct groups were formed according to cultural and linguistic affiliations. The western group included people from the North West and South West Nations, while the Ben Lommond Group included people from the North East, Ben Lommond and North Midlands Nations. The third group was the Big River Group, which also included people from the Oyster Bay Nation.

Traditional hunting trips were organised by the Aborigines for themselves, primarily for the collection of traditional food items. Birmingham's (1992) review of Robinson's journal entries brings to light several hunting patterns according to tribal affiliations. For instance the Big River people tended to stay along the west coast of Flinders Island, while the Ben Lommond Group hunted along the eastern side of the island. While the concept of the Wybalenna community was to indoctrinate the Aboriginal people into the British ideological system, it is apparent that many of the so called barbarous activities were still maintained. This included traditional hunting and gathering, the production of traditional crafts such as shell necklaces,

and spiritual practices with corroborees and dancing and singing (Birmingham 1992; Bowdler *in press*).

Despite these efforts, the combination of poor administration, contaminated water, and the irregular distribution of rationing, coupled with stresses on the local fauna and disease, the population continued to dwindle. In 1849 the population stood at 49, and at what was now considered a hapless cause, they were then removed to a former convict station at Oyster Cove. Bowdler (*in press*) considers it important to note however, that despite this failure, Aboriginal communities did survive on the mainland of Tasmania outside of the Bass Strait island community groups.

Further to this, Bowdler's (*in press*) and Merry's (2003) papers also highlight a somewhat different perspective on the emergence of the Aboriginal community of Bass Strait. The Aboriginal women hunted for the sealers, tended to the vegetable gardens, collected traditional food items, built huts and showed them how to make clothing and footwear out of animal skins. Historically, the Aboriginal women who lived with the Straitsmen have been depicted as victims of abduction and abuse. While it is pointed out by that abuse of the women is documented and that it did happen, it is also argued that the straits men relied on the women and their survival in part depended on them. This may have given the women more power than previously suggested.

Bowdler (*in press*:10) cites the work of Cameron (2011) who argues that many of the Aboriginal women ended up on the Furneaux Islands as a result of friendly exchanges. Communications and exchanges between the Bass Strait people and the North Eastern tribes were already established by 1812. These exchanges are argued to have evolved into detailed reciprocal exchanges of women for European items and food supplies. These exchanges of women were in accord with traditional marriage customs and as such a community developed. The women were integral to this new economy and community and recognised this by distinguishing themselves with a new name; *the tyereelore*. Bowdler (*in press*:10) continues by highlighting the fact that the *tyereelore* women were responsible for maintaining their own cultural traditions, hence assuring the long term survival of Aboriginal traditions amongst their many descendants.

## 4.0 Background Archaeology

### 4.1 Archaeology of the Bass Strait

The first archaeological evidence of Aboriginal use of the Bass Strait islands was found on Flinders Island in the 1930s (Mackay 1946; Sim 1991:6). However, given that stone artefacts had been left on the island following the movement of Aboriginal Tasmanians to Flinders Island in historic times by G.A. Robinson, the artefacts were not immediately recognized as being prehistoric in nature. While a number of stone artefacts continued to be identified on the Island during the 1930s and 40s, archaeological work was not undertaken for several decades, until Rhys Jones' 1960s excavations at Rocky Cape brought focus to the Bass Strait. At that time, Rocky Cape was the oldest dated Tasmanian archaeological site, where the lowest levels of cultural remains achieved radiocarbon dates of 8120 +/- 165 BP and 7465 +/- 150 BP (Jones 1971:198).

Bowdler's subsequent work at Cave Bay Cave on Hunter Island provided the first evidence of Pleistocene occupation in Tasmania with the discovery of 23,000 year old occupation layers (Jones 1965, 1971; Bowdler 1979). Later, archaeological investigations in the south west of Tasmania revealed cave deposits dating back to 35,000 years ago (Cosgrove 1991), while further preliminary evidence from Brighton in south eastern Tasmania, has provided evidence for Pleistocene occupation of the Jordon River valley dating back to c40,000 years ago (Robert Paton Archaeological services Pty Ltd 2010).

The discovery of the Pleistocene Cave Bay site on the Hunter Island, at that time, confirmed the generally accepted belief that mainland Aboriginal populations colonized Tasmania via a Bassian land bridge (Sim 1991). The Bassian land bridge would have been a vast area of land connecting the Australian mainland with Tasmania, with Hunter Island a hill on this vast plain.

Excavations at Mannalargenna Cave on Prime Seal Island, located approximately 5km west of Flinders Island, also revealed a long history of site use (Brown 1990). Sporadic site use is recorded from at least 20,000 years ago until roughly 8,500 years ago. Occupation is thought to have ceased when the islands comprising the greater Furneaux Group would have become islands with the last sea level rise (Sim 1991:11).

Following Jones (1965), further stone artefacts were identified on Flinders and several other Bass Strait islands between 1975 and 1979 (Jones 1979; Jones and Lampert 1978; Sim 1991). The first evidence of Aboriginal occupation of King Island (the western side of Bass Strait) was recorded by Jones in 1979 who found stone artefacts at the Petrified Forrest located on the southwest of the island. The discovery came some 50 years after the first recorded stone artefacts on Flinders Island. Jones argued that the artefacts were the product of people who had been 'stranded' on the island for several thousand years due to rising sea levels throughout the Holocene (1979:92).

Shell middens were also discovered during this period of investigation in various locations along the west coast of Flinders Island (Orchiston and Glenie 1978). The best investigated of these middens were those excavated by Orchiston at Palana, on the northwest coast of

Flinders Island (Orchiston and Glenie 1978, Orchiston 1979a, 1979b, 1984). Charcoal from an occupation layer was radiocarbon dated to c6000 to c7000 years ago. Similarly to Jones, it was argued that these midden deposits were left there by people who were stranded on Flinders Island after it became separated from Tasmania after the post glacial sea level rise.

During 1989 and 1990, Robin Sim undertook site surveys on King and Flinders Islands. At that time the results of the surveys led her to suggest that the islands may have been deliberately abandoned as rising seas separated and distanced them from mainland Tasmania during the Holocene. Calling into question the validity of the dates obtained for the Palana middens at Flinders Island, Sim began to question the relict/stranded island population theory and began to formulate a theory of abandonment prior to isolation.

Sim (1989) had recorded a series of shell middens in more than 10 localities along the west coast of Flinders Island. The survey identified a strong coincidence between the location of shell middens and places where the sea floor drops away sharply (Sim1991:12). Given the absence of middens in other areas it was argued that these middens had been deposited in times of lower sea levels but when the shoreline was in close proximity to the shellfish middens (Sim 1991). Sim therefore argued that the island was abandoned either before the last land link to mainland Tasmania was inundated, or sometime shortly after when the islands had already formed but sea levels were lower than the present (1990).

As a result of Sim's work on the islands it became apparent that the question of abandonment of the islands versus stranded relict human populations which subsequently died out, needed to be addressed. In 1991 Sim returned to the Bass Strait islands to complete a masters thesis exploring Aboriginal occupation of the Bassian Region with a specific focus on Flinders and King Islands. The King Island investigations provided a range of dated evidence of prehistoric Aboriginal occupation in the region, from Late Pleistocene human skeletal remains to Late Holocene shellfish middens. Test excavations undertaken in a sea cave deposit (Cliff Cave) discovered human remains, nearly 2m below the surface. Charcoal found adhering to one of the bones was dated to about 14,000 years ago (Sim 1994).

The only other dated site on King Island which shows evidence of human occupation of King Island from the period of lowered sea levels is an open quarry site (Catarauqui Monument), where charcoal associated with artefacts was dated to c10,000 years ago. Island phase occupation was identified by Sim at two locations where shellfish remains were exposed in eroding dunes at Catarauqui Point and Quarantine Bay. These sites date to 2000 and 1100 years ago, respectively (Sim 1994). The former sites are considered to represent occupation of the Island when it still formed a part of the Bassian land bridge, while the latter two were argued to represent not a relict human population, but were from accidental castaways. Owing to prevailing winds and currents, it is suggested that people using watercraft in the vicinity of Hunter Island were occasionally deviated from their course and ended up on King Island (Sim 1994).

The Furneaux Group of Islands, rather than depicting low intensity and discontinuous occupation, revealed a long period of Aboriginal occupation from at least 20,000 years ago,

until about 4,500 years ago (Brown 1991; Sim 1991). Two cave sites were excavated by Sim, one on Prime Seal Island (Mannalargenna Cave) and Beeton Cave on Badger Island. These sites show evidence of human occupation from 23,000 to 19,000 years ago, with evidence of sporadic occupation after the LGM 18,000 years ago. As was shown by Brown(1991) with his initial excavation of Mannalargenna Cave, the Beeton Cave also contained evidence for later sporadic occupation, with shell fish remains having been deposited around 8400 years ago (Sim 1992;1994; Bowdler 2014).

More importantly, open sites on Flinders Island with shell fish remains are as recent as 4500 years old. An extensive investigation of the Furneaux Islands (Sim 1992) revealed an absence of Holocene sites on other islands in the group, indicating to Sim that watercraft were not in use and that the recent evidence of coastal dwellers on Flinders Island, does in fact represent a stranded island population which eventually dies out c4500 years ago owing to environmental determinants.

#### **4.2 An Archaeological Model for the Bass Strait**

Bowdler (*in press*) has recently summarised the history of research into human occupation of the Bass Strait. She depicts a model of early Nations, which are defined by distinct archaeological signatures, specifically those identified by Cosgrove (1995) in the south west of Tasmania and similarities she has drawn together from the archaeological record of the Bass Strait. The south west Pleistocene system with its distinct archaeological signature; comprising of targeted wallaby hunting, Darwin glass, thumb nail scrapers and the dominance of quartz as a raw material, has been described by Cosgrove(1995) as a system of shared archaeological signatures. Bowdler suggests that this system may also be seen as an example of an archaeological nation, specifically an early south west nation.

Following this line of reasoning a Bassian Nation is also proposed. A Pleistocene presence is clearly indicated in the archaeological record of the Bass Strait. A number of sites show a human presence at the onset of the LGM, with Cave Bay Cave on Hunter Island in the south west of the Bassian Plain, and Mannalargenna Cave on Prime Seal Island and Beeton Rockshelter on Badger Island on the east side of the Bassian Plain. At this time all of these sites would have been hills arising out of a flat grassy plain. Furthermore, owing to the fact that they all show occupation around 23,000 years ago, coupled with what Bowdler (*in press:7*) argues is a consistency of archaeological evidence, another early nation is proposed.

The evidence from the Bass Strait has some similarities with the south western system, yet also contains differences according to the environment, location and cultural patterns. One of the main differences pointed out by Bowdler (*in press:7*) is that the Bass plain would have been a harsher more exposed environment than the south west of Tasmania, exposed to glacial winds and fewer available resources. In cultural terms, all of these sites share a predominance in the use of local quartz as a raw material for stone artefacts, thumb nail scrapers, ochre and bone points made out of wallaby fibulae. At the Furneaux group, the exploitation of a local resource not available in the west is indicated with the presence of artefacts made out of a fossil shell. Bowdler (*in press:7*) speculates as to whether this may represent an eastern clan.

The extent of this Bassian Nation as forwarded by Bowdler (*in press:7-8*), may be extrapolated in part. From east to west it would have extended from King to Flinders Island at a minimum, with the then coastlines located some distance away. No reasonable links with Victoria were identified, while it is suggested that the Pleistocene occupation of Hunter Island would warrant the inclusion of the north coast of Tasmania, no evidence has yet been identified along this coast line. It is speculated that the proposed Bassian Nation extended up to 450km east to west and up to 150km north to south, an area of approximately 68,000km<sup>2</sup>. Acknowledging the large size of this proposed territory, it is argued that during the LGM, the vegetation of the exposed Bassian Plain would have comprised of extensive grasslands and scattered Eucalypts, with a colder drier climate than today. This in turn would suggest a need for a wider range in territory.

Bowdler (*in press:8*) forwards an archaeological model which sees the people of the Bassian Nation expanding and contracting with the rising sea levels. Evidence of this nation is present in the Bass Strait from 23,000 years ago to 15,000 years ago, with an apparent decline in occupation 18,000 years ago at the height of the LGM. This suggests that people may have been retreating to the coast lines at this time. As the sea began to rise again, there is evidence of people following the returning coasts. At Badger Island and Prime Seal Island people returned around 8500 years ago and there is evidence on King island dating to c10,000 years ago (refer to section 5.1). Similarly, there is evidence of occupation on Erith Island between 10,000 and 8000 years ago, while people returned to Hunter Island 6,600 years ago(Bowdler *in press:8*).

In summary, it appears that at the height of the LGM, a period of particularly harsh environmental conditions, people were living along the coastal areas of the Bassian Plain, and had then subsequently followed the sea as it began to rise. Although, King Island appears to have been largely abandoned 10,000 years ago, there is evidence on the Hunter and Furneaux Islands for people maintaining a coastal lifestyle up to 4500 years ago. What happened next continues to be the subject of speculation. Whether these people developed the use of watercraft and left these islands, or simply died out owing to environmental deterministic variables, remains to be seen.

#### **4.3 Summary of Archaeological Work on-Flinders Island**

Much of the archaeology of Flinders Island has been discussed in Section 4.1. As seen in Section 4.1, the first archaeological evidence of Aboriginal use of the Bass Strait islands was found on Flinders Island in the 1930s (Mackay 1946: Sim 1991:6). However, given that stone artefacts had been left on the island following the movement of Aboriginal Tasmanians to Flinders Island in historic times by G.A. Robinson, the artefacts were not immediately recognized as being prehistoric in nature.

Although stone artefacts continued to be collected throughout the 1930's and 1940's, there are no reports of further archaeological research on the island until the 1970's. The first systematic research programme of the Furneaux Group began in 1975, with the discovery of a number of stone artefacts and shell midden deposits on the north west coast of Flinders Island. These middens were subsequently excavated and charcoal from an occupation layer

taken from a midden site at Palana, was radiocarbon dated to c6000 to c7000 years ago (Orchiston and Glenie 1978, Orchiston 1979a, 1979b, 1984).

In 1989, Robin Sim's, reconnaissance of the island recorded a total of 41 sites and eight potential sites, comprised of unoccupied rock shelter sites with deposits. Of the 41 sites recorded, four were midden sites which date to the historic occupation of the island, with the remaining sites comprising of prehistoric shell midden and/or artefact sites (Sim 1989). All but one of the un-occupied rock shelter sites were situated along the western coast of Flinders Island and associated with the calcareous limestone formations typical of that coast line (refer to sections 3.3 and 3.4). The one exception to this is a granitic outcrop located at Boat Harbour. None of the shelters recorded contained stone artefacts and some showed evidence of recent use.

Of the four historic midden sites, two were thought to date to the period of occupation of the Wybalenna settlement, with one midden site situated at Settlement Point, and the other at Lillies Bay. Both of these sites contain shell fish remains, flaked bottle glass and metal objects. The remaining historic midden sites are situated at Tommy Rews Point on the south west coast and Red Bluff on the east coast.

Eighteen prehistoric midden sites were identified along the west coast of the island; fourteen of which contained stone artefacts. With the exception of the two historic middens mentioned above all of the prehistoric midden sites are situated along the western coast of the island and all are associated with light calcareous dune deposits and the red- brown soil typically found in association with the Palana limestone dune formation (refer to Section 3.3 and 3.4). There is a distinctive pattern amongst the midden sites, with limpet shellfish remains comprising over 75% of the remains in 15 of the middens recorded. The other shellfish remains were generally chiton, periwinkles and whelk, in that order (Sim 1989).

Stone artefacts were identified at 75% of the midden sites however these are few in number and average an overall of less than four artefacts per site. None of the flaked stone on the midden sites showed evidence of retouch, although stone artefacts from the Palana midden sites excavated by Orchiston, did contain some retouched examples. A distinctive feature of the stone artefact assemblages identified on the west coast midden sites is the presence of a distinct flattened, ovoid limestone implement found on three of the midden sites. Similarities of these implements to limestone manuports identified at other sites, suggested to Sim (1989:27) a selection criteria related to function.

Stone artefact raw material types reflect the exploitation of locally available resources, and are dominated by quartz and quartzite with a lesser amount of coarse grained hornfels. Granitic cobble artefacts comprising of split, pitted ground and unmodified manuports were commonly associated with midden sites (Sim 1989).

Non coastal sites were also dominated by quartz and quartzite unmodified flakes. Site density patterns were mostly low, however higher numbers were recorded compared to coastal sites. Retouched flakes comprise a small amount of the assemblages and were solely made from a grey quartzite. Cores were only observed in non-midden sites.

On Flinders Island, sites with stone artefacts were located across a range of environmental zones. Along the western coast, all stone artefact sites identified are associated with midden sites, while at all non coastal sites, artefacts were recorded in proximity to freshwater sources such as lagoons or drained swamp areas. No quarry sites or knapping floors were observed at the time of survey, with sites predominantly consisting of low density modified or un- modified stone artefacts (Sim 1989).

Overall the distribution of sites on Flinders Island showed a concentration along the western and south western coastal zones. A number of sites were also identified along the eastern lowlands of the island, predominantly associated with lagoons and other water resources. No sites were identified in the mountainous and upland regions.

The principal aim of Sim's early research on the Furneaux Island's, was to establish a comprehensive chronological span of human occupation associated with shell midden sites on Flinders Island. In summary, all of the Flinders Island midden sites are characterised by;

- Scant numbers of shellfish remains;
- An absence of more sub-tidal species, such as abalone, crayfish and mud oyster and,
- Clear targeting of a small range of intertidal species, predominantly limpet (Sim 1994:363).

Although sub-tidal marine resources were almost certainly available, the midden remains indicate they were not being procured. This suggests that Aboriginal shellfish exploitation strategies on Flinders Island did not encompass the use of the sub-tidal zone. This restriction of the shellfish remains to intertidal species is consistent with the broader Tasmanian pattern of marine resource exploitation, where people do not appear to be diving for sub-tidal species, until the Late Holocene (Sim 1994:364).

On a return trip to Flinders Island in 1991, Sim collected charcoal and shell for radio-carbon dating from midden sites from five different locations on Flinders Island. Samples were collected from two different types of midden sites, namely palaeosol middens, which contain *in situ* contexts of shell and charcoal and in some cases artefacts, and deflated surface shell scatters, some of which had shell fish remains embedded in the uppermost stratigraphic unit along with charcoal and stone artefacts. Of the five sites sampled, the Caves Beach and West End sites contained palaeosols, while the Palana, Old Mans Head and Boat Harbour sites were of the latter type. The dating of these midden sites spanned from about 7000 to 5000 years ago, indicating that people were on Flinders Island several thousand years after the last Holocene sea level rise (Sim 1991; 1994:365)

#### **4.4 Registered Aboriginal Sites in the Vicinity of the Study Area**

As part of Stage 1 of the assessment process a search was undertaken of the Aboriginal Heritage Register (AHR) to determine if there was any registered Aboriginal heritage sites located within or in the general vicinity of the Quoin study area. The search shows that there are sixteen registered Aboriginal heritage sites that are situated within the general surrounds study area. Table 1 provides the summary details for these sixteen sites, whilst Figure 7 shows the location of these sites.

All of the sites recorded in the wider vicinity of the study area, were recorded as part of Sims (1989) reconnaissance survey of the island. They consist predominantly of unoccupied rock shelter sites, middens and associated artefact finds and scatters.

Two of these registered sites (AH 4148 and AH 4122) appear to be situated along the western edge of the boundaries of the Quoin study area, where it adjoins with the coastal reserve. AH 4148 is classified as a shell midden site which is located at the northern end of Killiecrankie Bay, just to the north of the point where Quoin Road enters the Bay. AH 4122 is also classified as a shell midden site. The site is located on the central portion of Killiecrankie Bay, and is associated with a limestone outcropping. These two sites are highlighted in red in Table 1. The site cards for these two sites are presented in Appendix 3 of this report.

An additional four registered sites are situated within a 1km radius of the Quoin study area. AH 4142 comprises of a shell midden site with an isolated find, while AH 4104, constitutes a shell midden site. The sites are situated to the immediate north of the study area at Old Man's Head South. The remaining two sites situated within proximity of the study area, are at Killiecrankie west and Killiecrankie Beach, south. The former site is an isolated find (AH 4114), while the latter site (AH 4143) is a shell midden with an isolated artefact.

Figure 8 shows the location of the six closest registered sites to the study area.

**Table 1: Summary details for registered Aboriginal sites in the vicinity of the study area**

Site ID	Site Types	Locality/ Site Name	Easting	Northing	Comments
4103	Unoccupied Rockshelter	Boat Harbour South Rockshelter	566213	5587884	Recorded by Sim (1989)
4104	Unoccupied Rockshelter, with a Shell Midden	Old Mans Head South	571913	5592684	Recorded by Sim (1989)
4107	Unoccupied Rockshelter	The Dock North Rockshelters (2)	573613	5594684	Recorded by Sim (1989)
4108	Unoccupied Rockshelter	The Dock North Limestone Shelter (1)	574313	5595384	Recorded by Sim (1989)
4109	Unoccupied Rockshelter	Deep Bight Rockshelter	570113	5589984	Recorded by Sim (1989)
4114	Isolated Artefact	Killiecrankie West	570913	5590384	Recorded by Sim (1989)
4117	Isolated Artefact	The Docks North	574013	5594884	Recorded by Sim (1989)
4121	Shell Midden	Boat Harbour South Shell Midden	566613	5588784	Recorded by Sim (1989)
4122	Shell Midden	Killiecrankie Beach	572813	5591484	Recorded by Sim (1989)
4140	Shell Midden and isolated Artefact	Sand Blow South of Limestone Bay	574513	5595684	Recorded by Sim (1989)
4141	Shell Midden and isolated Artefact	Docks North Blowout	574213	5594984	Recorded by Sim (1989)
4142	Shell Midden and isolated Artefact	Old Mans Head South Midden	572013	5592684	Recorded by Sim (1989)
4143	Shell Midden and isolated Artefact	Killiecrankie Beach, South	570613	5590284	Recorded by Sim (1989)
4146	Shell Midden and artefact Scatter	Boat Harbour South	566013	5587684	Recorded by Sim (1989)
4148	Shell Midden	Killiecrankie Beach, North	572613	5592284	Recorded by Sim (1989)
4150	Shell midden and artefact scatter	Boat Harbour North	568913	5590084	Recorded by Sim (1989)

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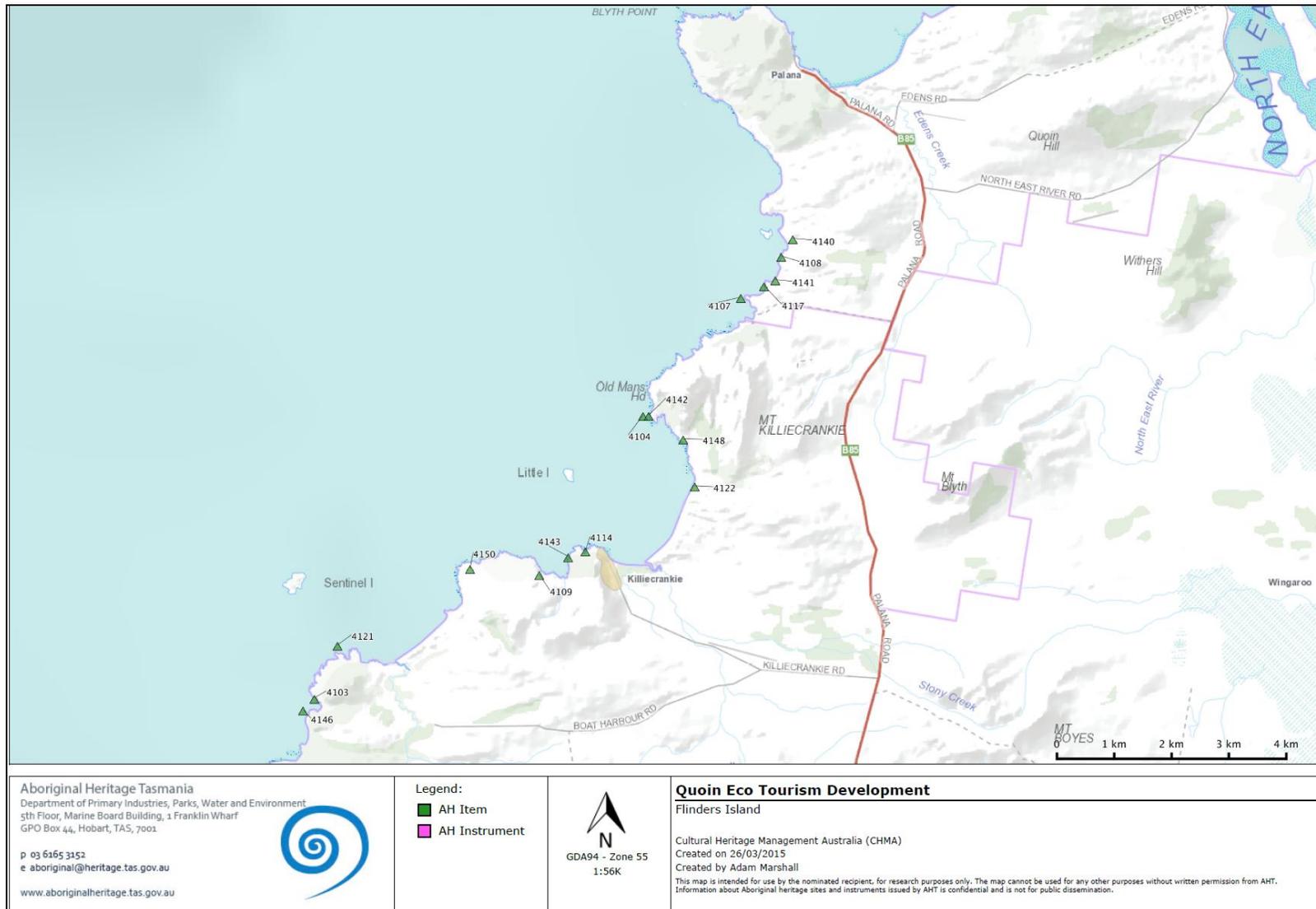


Figure 7: The location of previously recorded archaeological sites within the wider area of the Killiecrankie Study Area



**Figure 8: The location of the six registered Aboriginal sites to the Quoin study area**

## 5.0 Predictive Modelling

### 5.1 Introduction to Predictive Modelling

Predictive modelling, in an archaeological context, is a fairly straight forward concept and has been utilised by archaeologists in Australia for a number of years as a tool for undertaking research into Aboriginal heritage sites. In summary, predictive modelling involves the collation of information generated from previous archaeological research in a given region, and using this information to establish patterns of Aboriginal site distributions within the landscape of that particular region. On the basis of perceived patterns of site distribution, Archaeologists can then make predictive statements regarding the potential for various Aboriginal site types to occur within certain landscape settings, and can make preliminary assessments regarding the potential archaeological sensitivity of landscape types within a given region.

### 5.2 Predictive Models; Strengths and Weaknesses

It should be acknowledged that most, if not all predictive models have a number of potential inherent weaknesses which may serve to limit their value. These include, but may not be limited to the following.

- 1) The accuracy of a predictive model is directly influenced by the quality and quantity of available site data and information for a given region. The more data available and the greater the quality of that data, the more likely it is that an accurate predictive model can be developed.
- 2) Predictive modelling works very well for certain types, most particularly isolated artefacts and artefact scatters, and to a lesser extent scarred trees. For other site types it is far more difficult to accurately establish distribution patterns and therefore make predictive modelling statements. Unfortunately, these site types are generally the rarer site types (in terms of frequency of occurrence) and are therefore generally the most significant sites.
- 3) Predictive modelling (unless it is very sophisticated and detailed) will generally not take into account micro-landscape features within a given area. These micro features may include (but is certainly not limited to) slight elevations in the landscape (such as small terraces) or small soaks or drainage depressions that may have held water. These micro features have been previously demonstrated to occasionally be focal points for Aboriginal activity.
- 4) Predictive modelling to a large extent is often predicated on the presence of water courses. However, in some instances the alignment of these water courses has changed considerably over time. As a consequence the present alignment of a given water course may be substantially different to its alignment in the past. The consequence of this for predictive modelling (if these ancient water courses are not taken into account) is that predicted patterns of site distributions may be greatly skewed.

### 5.3 A Predictive Model of Site Distribution for the Study Area

Numerous archaeological sites have been recorded on Flinders Island, including surface artefact scatters, midden deposits, rockshelter sites, and historic sites relating to the Aboriginal re-occupation of the area. Stone artefact sites are generally of a low density and are commonly associated with middens on the west coast and with fresh water sources along the east coast. No Aboriginal sites have been recorded within the mountainous regions of the island. Artefact scatters are commonly of very low density and are dominated

by quartz and quartzite. Unmodified flakes and cobble artefacts are common. Site distribution patterns of the island suggest more intense occupation along the west and south west coast, compared to the east coast. All coastal midden sites are restricted to the west and south west coast and are typically associated with calcareous dune sands and the Palana limestone red-brown soil association. Midden faunal assemblages are dominated by intertidal shell fish species, such as limpet, and show a marked absence of sub- tidal species.

On the basis of this information, the following predictive statement is made for the study area.

- Sites will occur most commonly along the west coast margin in association with calcareous and limestone derived dune and soil deposits. The most likely localities for sites to be encountered within the study area are along the coastal foreshores and calcareous foothills.
- The most common site type expected are midden deposits, containing low density stone artefact scatters and finds;
- Midden deposits will contain scant numbers of shellfish remains. Clear targeting of a small range of intertidal species should be evident, with faunal assemblages dominated by limpet;
- Quartz and quartzite stone materials are expected to dominate site assemblages, however granitic cobbles are commonly found in association with coastal midden deposits.
- Unoccupied rock shelter sites are commonly identified along the west coast wherever they have formed in the extensive limestone formations which typify that coastline. Several unoccupied rockshelter sites exist in proximity to the study area. These shelter sites may or may not contain evidence of historic Aboriginal use.

## 6.0 Survey Coverage of the Study Area

### Survey Coverage

Survey coverage refers to the estimated portion of a study area that has actually been visually inspected during a field survey.

In total, 21.4km of transects were walked within and in the immediate surrounds of the Quoin study area, with each transect averaging 10m in width. This equates to an overall survey coverage of 214 000m<sup>2</sup>.

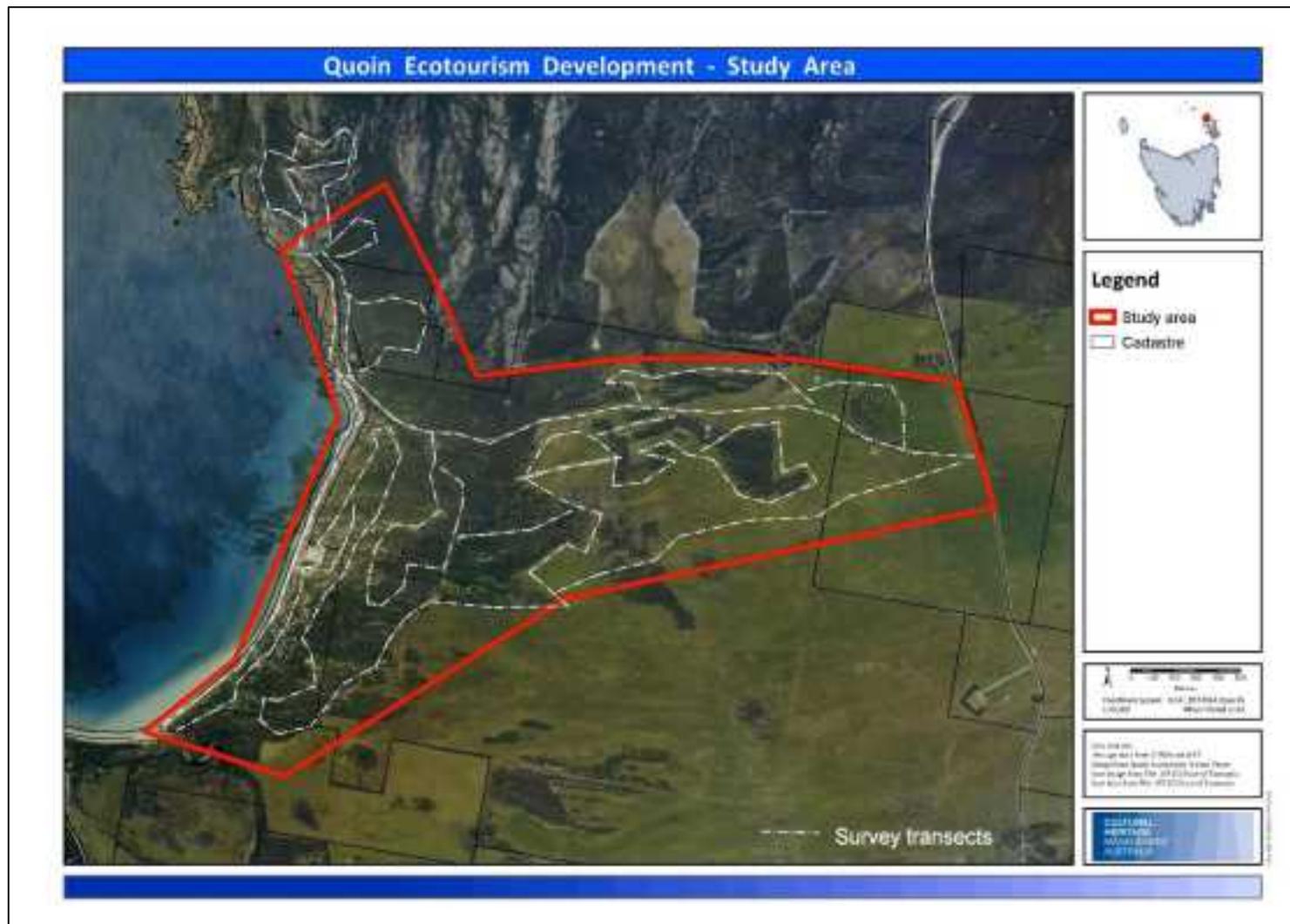
Approximately 8.3km of the survey transects were focused across the western portion of the study area, within the general footprint of the proposed eco-tourism development.

A total 3.4km of transects were walked along the main Quoin Road that runs in an east-west direction through the Quoin property, from Palana Road through to Killiecrankie Bay. This road will be upgraded, and used as the main access route to the eco-tourism development.

An additional 8.6km of transects were walked across the broader Quoin study area. These transects were aligned so as to cover a representative sample of the range of landscape units that occur within the study area. The main aim was to attempt to generate a better understanding of the extent and nature of Aboriginal sites across the broader study area landscape, and to try to identify any clear patterns in the distribution of sites across the landscape.

Finally, 1.1km of transects were walked in areas just outside the study area boundaries. These transects were focused along the western side slopes of Mount Killiecrankie, just to the north of the study area. There are a number of obvious granite overhangs in this area. The purpose of these transects was to try to ascertain if there was any evidence for the Aboriginal occupation of these overhangs.

Figure 9 shows the alignment of the transects walked by the field team.



**Figure 9: Survey transects walked within the Quoin study area**

### Surface Visibility

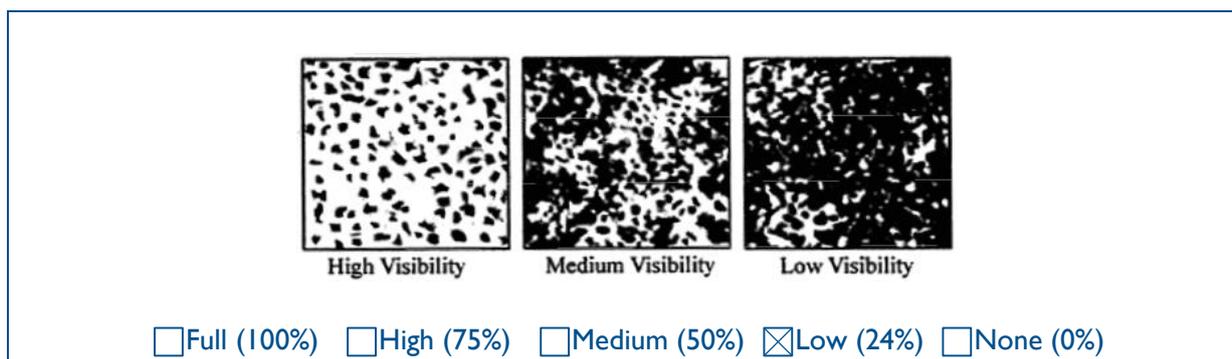
Surface Visibility refers to the extent to which the actual soils of the ground surface are available for inspection. There are a number of factors that can affect surface visibility, including vegetation cover, surface water and the presence introduced gravels or materials (see Figure 10 for visibility guidelines).

Surface visibility across the majority of the western portion of the study area, where the facilities will be sited was restricted to an estimated average of 30%. The main impediment to surface visibility in this area was vegetation cover in the form of coastal scrub (see Plate 12). There were numerous erosion scald areas across the dunes in this area that provided improved locales of surface visibility, as well as an access track that ran parallel to of the Killiecrankie Bay shoreline in the northern section of the study area (see Plate 13). Surface visibility was particularly poor in the gully area around the north-west portion of the study area, along the foot slopes of Mount Killiecrankie. Dense patches of tea tree in these areas made access to some parts of the study area very difficult.

Surface visibility along Quoin Road that runs in an east-west direction through the Quoin property was generally good, ranging between 40-80%, and averaging 60%. This road provided a long linear transect of improved surface visibility through the central portion of the study area (see Plate 14).

Surface visibility throughout the northern and eastern portions of the study area was generally fair, averaging around 40%. Vegetation cover was generally less dense in these areas, particularly in the grassed stock paddocks, where grass cover was sparse, and numerous erosion areas are present (see Plates 15 and 16).

In an effort to increase the effective survey coverage of the study area, additional survey transects were focused within those portions of the study area where there was improved visibility (see effective coverage).



**Figure 10: Guidelines for the estimation of surface visibility**

### Effective coverage

Variations in both survey coverage and surface visibility have a direct bearing on the ability of a field team to detect Aboriginal heritage sites, particularly site types such as isolated artefacts and artefact scatters. The combination of survey coverage and surface visibility is referred to as effective survey coverage. Table 2 presents the estimated effective survey coverage achieved within the study area. The overall effective coverage is estimated to have been 10 350m<sup>2</sup>.

**Table 2: Effective Survey Coverage achieved within the study area**

Area Surveyed	Total Survey Coverage	Estimated Surface Visibility	Effective Survey Coverage
West Portion of study area	8 300m x 10m = 83 000m <sup>2</sup>	30%	24 900 m <sup>2</sup>
Main Quoin Access Road	3 400 x 10m = 34 000m <sup>2</sup>	60%	20 400 m <sup>2</sup>
Remainder of Study Area	9 700 x 10m = 97 000m <sup>2</sup>	40%	38 800 m <sup>2</sup>
TOTAL	21 400 x 10m = 214 000m <sup>2</sup>		84 100 m <sup>2</sup>



Plate 12: View north, showing the typical conditions of surface visibility across the western portion of the study area



Plate 13: View south along vehicle track that runs parallel to the shoreline in the north-west portion of the study area



Plate 14: View east along Quoin Road which provided a transect of improved surface visibility through the study area



Plate 15: View west across the eastern portion of the study area, showing typical conditions of surface visibility



Plate 16: Sparse grass cover in the east portion of the study area, with surface visibility averaging 40%

## 7.0 Survey Results and Discussion

### 7.1 Summary Survey Results

In the course of the survey investigations, the field team identified a total of four Aboriginal heritage sites. All four recorded sites are located in a very similar landscape setting, being situated along the fore dunes that fringe Killiecrankie Bay, within 50m of the high tide mark.

One of the recorded sites corresponds with a previously registered Aboriginal site that was identified in the immediate vicinity of the study area (site AH 4148). This site was originally recorded by Robin Sim in 1989, and was classified as a shell midden. The site is located along the coastal reserve, on the northern end of Killiecrankie Bay. During the present survey, a sparse scatter of shell material and three stone artefacts was identified in the general vicinity of the reported location of site AH 4148.

The other three Aboriginal sites are new recordings (sites AH13053, AH13054 and AH13055). Site AH13053 is classified as a shell midden with an associated scatter of stone artefacts. The site is located on the edge of the coastal reserve, around the central portion of Killiecrankie Bay. Site AH13054 is situated around the northern end of Killiecrankie Bay and is classified as a shell midden deposit. Site AH13055 is classified as an isolated artefact, and is located on a graded vehicle track, approximately 100m north of site AH13054. Both of these sites are situated on the edge of the coastal reserve that fringes Killiecrankie Bay.

Table 3 provides the summary details for the four recorded sites, with Figure 11 showing the site locations. The detailed site descriptions are presented in Appendix 2 of this report.

As described in section 4.4 of this report, there was a second registered Aboriginal site that was reported to occur within, or in the immediate vicinity of the study area (site AH 4122). The site was recorded by Robin Sim in 1989, and is classified as a shell midden site. It is reported as being located on the fore dunes along the central portion of Killiecrankie Bay, at grid reference E572813 N5591484. Despite undertaking an extensive search in the general vicinity of the reported site location, the field team could not find any evidence for this site. Site AH13053, which was recorded by the field team as part of the present assessment is located around 300m south of the reported location of AH4122. The site is in a very similar landscape setting as that described for AH 4122, and the contents of the site are also very similar. It is therefore a possibility that Sim may have plotted the location of site AH 4122 incorrectly, and that sites AH 4122 and AH13053 are in fact the same site. This is entirely plausible given that the original recording of the site pre-dates the use of hand held GPS units, and the plotting of sites was often inaccurate.

No Aboriginal sites were recorded throughout the remainder of the Quoin study area. As described in section 6 of this report, surface visibility throughout the study area was constrained to some extent, and this restricted the effective survey coverage achieved by the field team. Nonetheless, the negative findings for the remainder of the Quoin study area is assessed as being an accurate reflection of the fact that Aboriginal site and artefact densities throughout the inland portions of the Quoin study area, away from the coastal margins are low to very low. This is discussed in more detail in section 7.2 of this report.

**Table 3: Summary details for Aboriginal heritage sites identified as part of the Aboriginal heritage assessment**

Site Name	Easting	Northing	Site Type	Description
AH13053	572633	5591104	Shell midden/Artefact Scatter	Site is located within a small swale on a fore dune that sits immediately above the shoreline of Killiecrankie Bay. The fore dune has formed over the top of an extensive outcropping of calcarenite limestone that extends along this section of the beach. A sparse scatter of shell material and three stone artefacts was identified across the 15m x 15m swale.
	572629	5591096		
	572613	5591099		
	572623	5591112		
AH13054	572716	5592068	Shell Midden	Site is located at the northern end of Killiecrankie Bay, at the point where the sandy beach line interfaces with an extensive series of inter-tidal granite rock platforms.  The site is situated on a the low lying fore dunes that fringe this section of the bay, and is around 30m inland (east) of the high tide mark. A very sparse and fragmented scatter of shell material was identified across an area measuring approximately 40m (north-south) x 25m (east-west).
	572726	5592065		
	572742	5592096		
	572711	5592101		
AH13055	572713	5592192	Isolated artefact	The site is located at the northern end of Killiecrankie Bay, at the point where the sandy beach line interfaces with an extensive series of inter-tidal granite rock platforms.  The artefact was identified on a graded vehicle track that runs in a north-south direction, parallel to the coastline of Killiecrankie Bay. The section of track where the artefact was identified was located around 30m inland from the high tide mark, at a point where the track traverses a broad east-west trending gully.
AH4148	572590	5592280	Shell midden/Artefact Scatter	The site is located at the northern end of Killiecrankie bay, approximately 40m inland (east) of the high tide mark, on a low relief fore- dune that is interspersed with granite outcroppings. The coastline in this area is comprised of a series of granite rock outcroppings that extends into the inter-tidal zone, forming a series of small protected gulches.  A sparse scatter of shell material and three stone artefacts were identified across an area measuring approximately 10m x 10m.
	572590	5592280		
	572590	5592280		
	572590	5592280		



Figure 11: The location of the Aboriginal sites located within the Quoin study area

## 7.2 Further Discussion

### ***Patterns of Site Distributions***

As summarised in section 7.1 of this report, a total of four Aboriginal heritage sites were identified during the field survey assessment of the Quoin study area. Additionally there was one previously registered site reported as occurring within the study area (AH 4122) that could not be re-located by the field team.

There is a very strong site distribution pattern observable for these sites. All five sites are situated along the frontal dunes that fringe the foreshore margins of Killiecrankie Bay, within 50m of the high tide mark. Three of the sites (AH 4148), AH13054 and AH13055) are clustered around the northern section of Killiecrankie Bay, around the point where the sandy beach shoreline interfaces with a granite rock shoreline, where there are extensive rock platforms that extend into the inter-tidal zone of the bay (see Plate 17). This interface zone between rocky and sandy shorelines, is an area where there is a confluence of marine resources, including a broad range of shell fish species. The remaining two sites (AH 4122 and AH13053) are situated along the fore dunes of the sandy beach of Killiecrankie Bay. However, they are sited in areas where there are outcroppings of limestone occurring along the shoreline, with these outcrops extending into the inter-tidal zone, forming small rock platform areas. Again, this would be an area where there was a confluence of marine resources.

There was no real discernible differences in surface visibility in the areas where the sites were located, compared with the rest of the Quoin study area. It must therefore be assumed that the observed pattern of site distribution is a real reflection of Aboriginal land use patterns in this area. It would appear that Aboriginal activity along this part of the Flinders Island coast line was focused along the foreshore margins of Killiecrankie Bay, with a preference for locations where a broader range of marine and shell fish resources were available.

Interestingly, all five sites located within the study area are comparatively small in extent, and quite sparse in terms of shell and stone artefact materials present (see Plate 18 and 19). These sites are representative of sporadic activity, as opposed to more intensive forms of occupation. Moreover, the density of sites along this section of coast line would also be considered to be comparatively low, particularly given the extensive range of marine and aquatic resources that are present within Killiecrankie Bay. The overall impression is that Aboriginal activity along this section of the coast line was sporadic, and primarily limited to occasional harvesting of marine resources.

This general impression of low levels of Aboriginal activity is supported by the negative findings across the broader Quoin study area. As described in section 6 of this report, 21.4km of transects were walked across the Quoin study area, with over 13km of these survey transects being focused across the inland parts of the study area, away from the foreshore margins of Killiecrankie Bay. Not a single Aboriginal site was identified within these inland areas, despite the fact that surface visibility throughout these inland areas was generally fair (averaging 40%).

The survey of the inland areas of the Quoin study area included an inspection of a number of granite rock overhangs that are present on the western side slopes of Mount Killiecrankie. These overhangs are located just outside the northern boundaries of the study area. The purpose of these transects was to try to ascertain if there was any evidence for the Aboriginal occupation of these overhangs. Six overhangs were inspected, with each overhang being sizeable, and adequately suited to having been utilised as a rock shelter by Aboriginal people (see Plate 20). No evidence of Aboriginal occupation identified within any of these overhangs. In each instance, there was very little accumulation of soil deposits on the floors of these shelters, which means there is very possibility for undetected artefact deposits to be present on the floors of these overhangs. Once again, the negative findings at these overhang locations, adds to the overall impression that Aboriginal activity across this part of the coast line was sparse.

### ***Comparisons with the Findings of Previous Research Undertaken by Sim***

The observed pattern of site distribution for the Quoin study area, as well as the site types identified, is broadly consistent with the findings of Sim (1989; 1991; 1994), who carried out reconnaissance surveys across parts of Flinders Island, including Killiecrankie Bay.

Sim (1989) identified 18 prehistoric midden sites along the west coast of the island; 14 of which contained stone artefacts. All of the prehistoric midden sites are associated with light calcareous dune deposits and the red- brown soil typically found in association with the Palana limestone dune formation (refer to Section 3.3 and 3.4). The five sites identified during the present Quoin study are also all associated with light calcareous dune deposits (see Plate 17).

Sim (1989) observed a distinctive pattern amongst the midden sites, with limpet shellfish remains comprising over 75% of the remains in 15 of the middens recorded. The other shellfish remains were generally chiton, periwinkles and whelk, in that order (Sim 1989). Stone artefacts were identified at 75% of the midden sites however these are few in number and average an overall of less than four artefacts per site. None of the flaked stone on the midden sites showed evidence of retouch. A distinctive feature of the stone artefact assemblages identified on the west coast midden sites is the presence of a distinct flattened, ovoid limestone implement found on three of the midden sites. Similarities of these implements to limestone manuports identified at other sites, suggested to Sim (1989:27) a selection criteria related to function. Stone artefact raw material types reflect the exploitation of locally available resources, and are dominated by quartz and quartzite with a lesser amount of coarse grained hornfels. Granitic cobble artefacts comprising of split, pitted ground and unmodified manuports were commonly associated with midden sites (Sim 1989). In summary, all of the Flinders Island midden sites are characterised by;

- Scant numbers of shellfish remains;
- An absence of more sub-tidal species, such as abalone, crayfish and mud oyster and,
- Clear targeting of a small range of intertidal species, predominantly limpet (Sim 1994:363).

The contents of the sites identified during the Quoin study area are consistent with the Sim's findings summarised above. Limpets dominated the shell species assemblage of the recorded sites, with very few additional species represented. Small numbers of stone artefacts were present at two of the midden sites, with the stone assemblage being limited to unmodified flakes made from locally obtainable stone resources, and one igneous manuport (see Plates 18 and 19).

Overall, Sim (1989) observed that the distribution of sites on Flinders Island showed a concentration of sites along the western and south western coastal zones. However, even in these areas, site densities were noted to be low. Site densities in the inland parts of the Island were also noted to be generally low, although increases in site densities were observed in proximity to freshwater sources such as lagoons or drained swamp areas, with sites predominantly consisting of low density modified or unmodified stone artefacts. No quarry sites or knapping floors were observed (Sim 1989).

As described previously, the present survey confirmed that site densities within the Quoin study area were also low. Those sites that were identified, were small in extent, and were located along the coastal margins. The apparent absence of sites within the inland parts of the study area may be attributed to the lack of lagoons or major fresh water sources in the study area. The largest water course in proximity to the study area is Killiecrankie Creek which runs adjacent to the south-west corner of the study area, emptying into the southern end of Killiecrankie Bay. The only other significant water course in the study area is a small ephemeral creek line that runs through the north-west portion of the study area, emptying into the north section of the Bay. Throughout the remainder of the study area there are only small drainage gullies. No major swamps or lagoons occur in the study area.

#### ***Potential Impacts of the Quoin Eco Tourism Development on Aboriginal Heritage Resources***

This assessment has confirmed the presence of five Aboriginal heritage sites within the study area. All of these sites are located along the west boundary of the study area, at the junction with the thin strip of coastal reserve. All five sites appear to be situated just outside the current proposed development footprint of the facilities associated with the eco-tourism development. As such, it appears that these sites may not be directly impacted by the proposed development. Management strategies have been put in place to help ensure that these sites are protected (see section 11 for details).

As described in section 6 of this report, surface visibility across the Quoin study area was restricted to some extent due to vegetation cover, and these restrictions reduced the effective survey coverage achieved by the field team. Overall, the field team achieved a survey coverage of 214 000m<sup>2</sup>. However, taking surface visibility constraints into account, effective coverage was reduced to 84 100 m<sup>2</sup>.

Given these constraints, it is acknowledged that there is the potential that there will be undetected Aboriginal heritage sites present in the study area. However, 84 100 m<sup>2</sup> of effective coverage is still comparatively high, and is certainly sufficient to generate a general impression as to the extent of Aboriginal heritage sites across the study area. As discussed

earlier, the overwhelming impression is that site densities across the western portion of the study area, bordering Killiecrankie Bay is low. Further inland, away from the foreshore margins, site densities appear to very low. On this basis, it is predicted that there is a low potential for the proposed eco-tourism development to impact on Aboriginal heritage sites.



Plate 17: View north at site AH13054, showing typical landscape setting of the sites identified during the survey of the Quoin study area



Plate 18: Shell material from site AH13053, showing typical composition of the recorded middens



Plate 19: Stone artefacts associated with site AH13053. In terms of artefact and stone material types, these are typical of sites recorded along the Flinders Island west coast



Plate 20: One of the six rock overhangs that were inspected during the survey. No evidence of Aboriginal occupation was identified in any of these overhangs

## 8.0 Site Significance Assessments

The following provides an outline of the processes used to assess the significance of the Aboriginal heritage sites that were identified during the course of the assessment.

### 8.1 Assessment Guidelines

There are several different ways of defining types of significance, and many practitioners have developed their own system of significance assessment. However, as Sullivan and Pearson (1995) point out, there seems to be a general advantage in using a set of criteria which is already widely accepted. In Australia cultural significance is usually assessed against the Burra Charter guidelines and the Australian Heritage Commission guidelines (ICOMOS 1988, 1999).

### 8.2 The Burra Charter

Under the guidelines of the Burra Charter 'cultural significance' refers to the 'aesthetic, historic, scientific, social or spiritual value for past, present or future generations' of a 'place' (ICOMOS 1999:2). The guidelines to the Burra Charter comment:

*"Although there are a variety of adjectives used in definitions of cultural significance in Australia, the adjectives 'aesthetic', 'historic', 'scientific' and 'social' ... can encompass all other values".*

The following provides the descriptions given for each of these terms.

#### ***Aesthetic Value***

Aesthetic value includes aspects of sensory perception for which criteria can and should be stated. Such criteria may include consideration of the form, scale, colour, texture and materials of the fabric; the smells and sounds associated with the place and its use (Marquis-Kyle & Walker 1992).

#### ***Historic Value***

A place may have historic value because it has influenced, or has been influenced by, an historic figure, event, phase or activity. It may also have historic value as the site of an important event. For any given place the significance will be greater where evidence of the association or event survives in situ, or where the settings are substantially intact, than where it has been changed or evidence does not survive. However, some events or associations may be so important that the place retains significance regardless of subsequent treatment (Marquis-Kyle & Walker 1992).

#### ***Scientific Value***

The scientific or research value of a place will depend upon the importance of the data involved or its rarity, quality or representativeness and on the degree to which the place may contribute further substantial information.

A site or a resource is said to be scientifically significant when its further study may be expected to help current research questions. That is, scientific significance is defined as research potential (Marquis-Kyle & Walker 1992).

### **Social Value**

The social value of a place is perhaps the most difficult value for heritage professionals to substantiate (Johnston 1994). However, social value is broadly defined as ‘the qualities for which a place has become a focus of spiritual, political, natural or other cultural sentimental to a majority or minority group’ (ICOMOS 1988:30). In *What is Social Value*, Johnston (1994) has provided a clear definition of social value:

*“Social value is about collective attachment to places that embody meaning important to a community, these places are usually community owned or publicly accessible or in some other way ‘appropriated’ into people’s daily lives. Such meanings are in addition to other values, such as the evidence of valued aspects of history or beauty, and these meanings may not be apparent in the fabric of the place, and may not be apparent to the disinterested observer”. (Johnston 1994:10)*

Although encompassed within the criterion of social value, the spiritual value of a place is a more recent addition to the Burra Charter (ICOMOS 1999:1). Spiritual value is predominantly used to assess places of cultural significance to Indigenous Australians.

The degree to which a place is significant can vary. As Johnston (1994:3) has stated when trying to understand significance a ‘variety of concepts [are] used from a geographical comparison (‘national’, ‘state’, ‘local’) to terms such as ‘early’, ‘rare’, or ‘seminal’’. Indeed the Burra Charter clearly states that when assessing historic significance, one should note that for:

*“any given place the significance will be greater where evidence of the association or event survives in situ, or where the setting are substantially intact, than where it has been changed or evidence does not survive”. (ICOMOS 1988:29)*

### **8.3 Significance Criteria Relevant to Indigenous Sites**

Indigenous heritage sites and places may have educational, tourism and other values to groups in society. However, their two principal values are likely to be in terms of their cultural / social significance to Aboriginal people and their scientific / archaeological significance. These are the two criteria that are commonly used in establishing the significance of Aboriginal sites. The following provides an explanation of these criteria.

#### **1) Aboriginal Cultural / Social Significance**

This relates to the value placed upon a site or suite of sites by the local or regional Aboriginal community. The identification and assessment of those sites that are significant to Aboriginal people is a matter for Aboriginal people. This assessment can only be made by the appropriate Aboriginal representatives of the relevant communities.

#### **2) Scientific (Archaeological) Significance**

Archaeological significance values (or scientific values) generally are assessed on the potential of a site or place to generate knowledge through archaeological research or knowledge. Bowdler (1984) states that the scientific significance should be assessed according to timely and specific research questions (research potential) and site representativeness.

Research potential entails the potential of a site or suite of sites for scientific research and excavation. This is measured in terms of a site's ability to provide information on aspects of Aboriginal culture. In this respect, the contents of a site and their state of preservation are important considerations.

Representativeness takes account of how common a site type is (Bowdler 1984). That is, it allows sites to be evaluated with reference to the known archaeological record within the given region. The primary goal of cultural resource management is to afford the greatest protection to a representative sample of sites throughout a region. The corollary of a representative site is the notion of a rare or unique site. These sites may help to understand the patterning of more common sites in the surrounding area, and are therefore often considered of archaeological significance. The concept of a rarity cannot be easily separated from that of representativeness. If a site is determined to be rare, then it will by definition be included as part of the representative sample of that site type.

The concepts of both research potential and representativeness are ever changing variables. As research interests shift and archaeological methods and techniques change, then the criteria for assessing site significance are also re-evaluated. As a consequence, the sample of site types which are used to assess site significance must be large enough to account for the change in these variables.

#### **8.4 Summary Significance Ratings for Recorded Sites**

There are four Aboriginal heritage sites that have been identified during the course of the survey investigations of the Quoin study area (sites AH 4148, AH13053, AH13054 and AH13055).

These four sites have each been assessed and allocated a rating of significance, based on the criteria presented in section 8.2. As discussed in section 8.2, Aboriginal sites are usually assessed in terms of their scientific and social significance. The concepts of Aesthetic significance and Historic significance are rarely applied in the assessment of Aboriginal sites unless there is direct evidence for European/Aboriginal contact activity at the site, or the site has specific and outstanding aesthetic values. However, based on advice received from AHT, aesthetic and historic significance values have also been taken into consideration as part of the assessment of the four sites.

A five tiered rating system has been adopted for the significance assessment; low, low-medium, medium, medium-high and high. Table 4 provides the summary details for significance ratings for the four sites. A more detailed explanation for the assessment ratings are presented in sections 8.5 to 8.8.

**Table 4: Summary significance ratings for Aboriginal sites identified as part of the Aboriginal heritage assessment of the Quoin Eco-Tourism Development**

Site Number	Site Type	Scientific Significance	Aesthetic Significance	Historic Significance	Social Significance
AH4148	Shell Midden/Artefact Scatter	Low-medium	Medium	N/A	Medium-high
AH13053	Shell Midden/Artefact scatter	Low-medium	Medium	N/A	Medium-high
AH13054	Shell Midden	Low-medium	Medium	N/A	Medium-high
AH13055	Isolated artefact	Low	Medium	N/A	Medium-high

### 8.5 Scientific Significance for Recorded Sites

Archaeological (or scientific) significance values generally are assessed on the potential of a site or place to generate knowledge through archaeological research or knowledge. Bowdler (1984) states that the scientific significance should be assessed according to timely and specific research questions (research potential) and site representativeness. Research potential entails the potential of a site or suite of sites for scientific research and excavation. This is measured in terms of a site's ability to provide information on aspects of Aboriginal culture. In this respect, the contents of a site and their state of preservation are important considerations. Representativeness takes account of how common a site type is (Bowdler 1984).

Sites AH 4148, AH13053 and AH13054 are all classified as shell midden deposits, with sites AH 4148 and AH13053, both having stone artefacts associated with the shell deposit. Site AH13055 is classified as an isolated artefact.

Artefact scatters/Isolated artefact and shell midden deposits are two of the most common site types recorded on Flinders Island (as evidenced through the AH search for this project), and more broadly, the State of Tasmania. As such, the scientific significance of artefact scatters and shell middens usually relates primarily to their research potential as opposed to the rarity of the site type. The potential exception to this is where comparatively rare artefact types (either tool or stone material types) are represented in assemblages, or the midden material is unusual in terms of the species represented.

Sites AH 4148, AH13053 and AH13054 comprise a sparse scatter of highly fragmented shell material. There is no evidence of shell lenses being present at any of the sites, nor is there any evidence for site stratification. Moreover, the shell species represented in the shell material at these sites (limpets and abalone) are commonly found in other sites across Flinders Island. The artefacts associated with sites AH 4148 and AH13053 are unmodified flakes made from locally obtained materials. On the basis of the above, the research potential for these sites is assessed as being very limited. The three sites are situated in relatively undisturbed contexts, which does serve to elevate their research value slightly. Taking these factors into account, sites AH 4148, AH13053 and AH13054 are all assessed as being of low-medium scientific significance.

Site AH13055 (an isolated artefact) is situated in a disturbed context, being located on eroded section of a graded vehicle track. The single artefact is an unmodified lake flake which is manufactured from locally obtained material. The site has little potential to be larger in extent, and as such the research value is very limited. On the basis of the above the site is assessed as being of low significance.

#### **8.6 Aesthetic Significance for Recorded Sites**

Aesthetic value includes aspects of sensory perception for which criteria can and should be stated. Such criteria may include consideration of the form, scale, colour, texture and materials of the fabric; the smells and sounds associated with the place and its use (Marquis-Kyle & Walker 1992).

The four sites are all situated along the coastal reserve of Killiecrankie Bay, at the foot slopes of Mount Killiecrankie. This landscape setting remains relatively unaltered, having been subject to very minimal land clearing and development activity. Given that the intrinsic landscape setting of this area of Killiecrankie Bay is still in-tact, the aesthetic values of the four sites are assessed as being medium-high.

#### **8.7 Historic Significance for Recorded Sites**

A place may have historic value because it has influenced, or has been influenced by, an historic figure, event, phase or activity. It may also have historic value as the site of an important event. For any given place the significance will be greater where evidence of the association or event survives in situ, or where the settings are substantially intact, than where it has been changed or evidence does not survive. However, some events or associations may be so important that the place retains significance regardless of subsequent treatment (Marquis-Kyle & Walker 1992).

Historic significance is not an attribute often considered when assessing the significance of Aboriginal sites, unless there is direct evidence for some form of European/Aboriginal contact activity. In this instance no such evidence exists for any of the four recorded Aboriginal sites. As such the concept of historic significance is not applicable to these sites.

## 9.0 Consultation with Aboriginal Communities and Statement of Aboriginal Significance

The designated Aboriginal Heritage Officer (AHO) for this project is Vernon Graham. One of the primary roles of the Aboriginal Heritage Officer is to consult with Aboriginal community groups. The main purpose of this consultation process is:

- to advise Aboriginal community groups of the details of the project,
- to convey the findings of the Aboriginal heritage assessment,
- to document the Aboriginal social values attributed to Aboriginal heritage resources in the study area,
- to discuss potential management strategies for Aboriginal heritage sites, and
- to document the views and concerns expressed by the Aboriginal community representatives.

Vernon Graham has undertaken the Aboriginal community consultation component for this project. As part of this process, Vernon Graham and Stuart Huys met with the Flinders Island Aboriginal Association Inc. (FIAAI). This meeting took place after the completion of the field survey assessment, on the 10-4-2015. FIAAI representatives were given a briefing of the findings of the survey assessment, and discussions were held regarding potential management strategies for identified Aboriginal sites.

Vernon Graham has subsequently provided FIAAI and a range of other Tasmanian Aboriginal groups with a copy of this report for review and comment. Vernon Graham will prepare a separate document which presents the outcomes of the Aboriginal community consultation program. This will be forwarded to AHT.

Vernon Graham has provided a statement of the Aboriginal cultural values attributed to the sites identified during the present investigations, as well as a statement of significance for the cultural values encompassed within the study area as a whole. This statement is presented below.

### **Statement of Cultural/Social Significance by Vernon Graham**

*Aboriginal heritage/relics are not renewable. Hence any cultural heritage values provide a direct link to past occupation undertaken by traditional indigenous ancestors to the region of the project proposal. This provides a story or link for the Aboriginal community today, and facilitates the connection to social cultural heritage values, ethno history /story and the relationship pertaining to country. This is an integral part of regaining knowledge so it can be encapsulated and retained by the both individual Aboriginal people and for the Aboriginal community collectively.*

*Four Aboriginal sites were identified by us during the field survey. The sites are still in their natural setting and remain relatively undisturbed. These sites are considered to be important to our people, as they represent a tangible link with our past ancestors. For this reason, efforts should be made to conserve these sites. To this end I would advocate that measures are put in place to protect these sites so that they are not impacted by the proposed*

*development. The sites appear to be situated outside the proposed development footprint. As such, protecting the sites should be a fairly straight forward process.*

*Even if the site of the project proposal contains no evidence of Aboriginal heritage there is always the cultural resources (flora, fauna, aquaculture or any other resource values that the earth may offer) and the living landscape, which highlight the high significance to the Aboriginal cultural heritage values to the country.*

*The study area is located on the borders of Killiecrankie Bay. There is an abundance of marine resources present along this section of the coast line. There is also a wide range of plant resources including native sea spinach and pig weed. It is acknowledged that these bush tucker resources will be impacted to some extent by the proposed eco-tourism development. However, opportunities do exist for the re-planting of bush tucker plants post development, and this would be encouraged.*

## 10.0 Statutory Controls and Legislative Requirements

The following provides an overview of the relevant State and Federal legislation that applies for Aboriginal heritage within the state of Tasmania.

### 10.1 State Legislation

The protection of Aboriginal cultural heritage in Tasmania is principally governed by the *Aboriginal Relics Act 1975* (The Act). It should be noted that this Act is presently under review. Under the Act, Aboriginal cultural heritage is defined as any place, site or object made or created by, or bearing the sign of the activities of the original inhabitants of Australia or descendants of such inhabitants on or before 1876.

The Department of Primary Industries, Parks, Water and the Environment (DPIPWE), through Aboriginal Heritage Tasmania (AHT) is the state government body that is responsible for administering the Act. The main provisions of the Act are as follows.

- All Aboriginal relics are protected under the Act and it is illegal to destroy, damage, deface, conceal or otherwise interfere with a relic, unless in accordance with the terms of a permit granted by the Minister.
- It is illegal to cause an excavation to be made or any other work to be carried out on Crown Land for the purpose of searching for a relic without a permit.
- It is illegal to sell or offer for sale a relic, or to cause or permit a relic to be taken out of Tasmania without a permit.
- Persons who own or have knowledge of a relic have an obligation to inform the Parks and Wildlife Service and to provide information regarding the location of the relic(s).
- Under Section 7 of the Act, the Minister may, on the recommendation of the Director, declare an area of land containing an Aboriginal relic to be a protected site.

It should be noted that with regard to the discovery of suspected Aboriginal skeletal remains, the *Coroners Act 1995* takes precedence.

### 10.2 Commonwealth Legislation

There are also a number of Federal Legislative Acts that pertain to cultural heritage. The main Acts being *The Australian Heritage Council Act 2003*, *The Aboriginal and Torres Strait Islander Heritage Protection Act 1987* and the *Environment Protection and Biodiversity Conservation Act 1999*.

#### ***Australian Heritage Council Act 2003 (Comm)***

The *Australian Heritage Council Act 2003* defines the heritage advisory boards and relevant lists, with the Act's Consequential and Transitional Provisions repealing the Australian Heritage Commission Act 1975. The Australian Heritage Council Act, like the Australian Heritage Commission Act, does not provide legislative protection regarding the conservation of heritage items in Australia, but has compiled a list of items recognised as possessing heritage significance to the Australian community. The Register of the National Estate, managed by the Australian Heritage Council, applies no legal constraints on heritage items included on this list.

### ***The Aboriginal and Torres Strait Islander Heritage Protection Act 1987***

This Federal Act is administered by the Department of Sustainability, Environment, Water, Populations and Communities (SEWPaC) with the Commonwealth having jurisdiction. The Act was passed to provide protection for the Aboriginal heritage, in circumstances where it could be demonstrated that such protection was not available at a state level. In certain instances the Act overrides relevant state and territory provisions.

The major purpose of the Act is to preserve and protect from injury and desecration, areas and objects of significance to Aborigines and Islanders. The Act enables immediate and direct action for protection of threatened areas and objects by a declaration from the Commonwealth minister or authorised officers. The Act must be invoked by, or on behalf of an Aboriginal or Torres Strait Islander or organisation.

Any Aboriginal or Torres Strait Islander person or organization may apply to the Commonwealth Minister for a temporary or permanent 'Stop Order' for protection of threatened areas or objects of significant indigenous cultural heritage.

The Commonwealth Act 'overrides' State legislation if the Commonwealth Minister is of the opinion that the State legislation (or undertaken process) is insufficient to protect the threatened areas or objects. Thus, in the event that an application is made to the Commonwealth Minister for a Stop Order, the Commonwealth Minister will, as a matter of course, contact the relevant State Agency to ascertain what protection is being imposed by the State and/or what mitigation procedures have been proposed by the landuser/developer.

In addition to the threat of a 'Stop Order' being imposed, the Act also provides for the following:

- If the Federal Court, on application from the Commonwealth Minister, is satisfied that a person has engaged or is proposing to engage in conduct that breaches the 'Stop Order', it may grant an injunction preventing or stopping such a breach (s.26). Penalties for breach of a Court Order can be substantial and may include a term of imprisonment;
- If a person contravenes a declaration in relation to a significant Aboriginal area, penalties for an individual are a fine up to \$10,000.00 and/or 5 years gaol and for a Corporation a fine up to \$50,000.00 (s.22);
- If the contravention is in relation to a significant Aboriginal object, the penalties are \$5,000.00 and/or 2 years gaol and \$25,000.00 respectively (s.22);
- In addition, offences under s.22 are considered 'indictable' offences that also attract an individual fine of \$2,000 and/or 12 months gaol or, for a Corporation, a fine of \$10,000.00 (s.23). Section 23 also includes attempts, inciting, urging and/or being an accessory after the fact within the definition of 'indictable' offences in this regard.

The Commonwealth Act is presently under review by Parliament and it is generally accepted that any new Commonwealth Act will be even more restrictive than the current legislation.

### ***Environment Protection and Biodiversity Conservation Act 1999 (Comm)***

This Act was amended, through the Environment and Heritage Legislation Amendment Act (No1) 2003 to provide protection for cultural heritage sites, in addition to the existing aim of

protecting environmental areas and sites of national significance. The Act also promotes the ecologically sustainable use of natural resources, biodiversity and the incorporation of community consultation and knowledge.

The 2003 amendments to the *Environment Protection and Biodiversity Conservation Act 1999* have resulted in the inclusion of indigenous and non-Indigenous heritage sites and areas. These heritage items are defined as:

*'indigenous heritage value of a place means a heritage value of the place that is of significance to indigenous persons in accordance with their practices, observances, customs, traditions, beliefs or history;*

Items identified under this legislation are given the same penalty as actions taken against environmentally sensitive sites. Specific to cultural heritage sites are §324A-324ZB.

***Environment and Heritage Legislation Amendment Act (No1) 2003 (Comm)***

In addition to the above amendments to the *Environment Protection and Biodiversity Conservation Act 1999* to include provisions for the protection and conservation of heritage, the Act also enables the identification and subsequent listing of items for the Commonwealth and National Heritage Lists. The Act establishes the *National Heritage List*, which enables the inclusion of all heritage, natural, Indigenous and non-Indigenous, and the *Commonwealth Heritage List*, which enables listing of sites nationally and internationally that are significant and governed by Australia.

In addition to the *Aboriginal and Torres Strait Islander Heritage Protection Act 1987*, amendments made to the *Environment Protection and Biodiversity Conservation Act 1999 (Cth)* enables the identification and subsequent listing of indigenous heritage values on the Commonwealth and/or National Heritage Lists (ss. 341D & 324D respectively). Substantial penalties (and, in some instances, gaol sentences) can be imposed on any person who damages items on the National or Commonwealth Heritage Lists (ss. 495 & 497) or provides false or misleading information in relation to certain matters under the Act (ss.488-490). In addition, the wrongdoer may be required to make good any loss or damage suffered due to their actions or omissions (s.500).

## 11.0 Aboriginal Cultural Heritage Management Plan

Heritage management options and recommendations provided in this report are made on the basis of the following criteria:

- Consultation with Vernon Graham (Aboriginal Heritage Officer);
- The legal and procedural requirements as specified in the *Aboriginal Relics Act 1975* (The Act);
- The results of the investigation as documented in this report; and
- Background research into the extant archaeological and ethno-historic record for the study area and the surrounding region.

The recommendations are aimed at minimising the impact of the proposed Quoin eco-tourism development on the Aboriginal cultural heritage resources present within the study area. Table 5 provides a summary overview of the management recommendations. The more detailed recommendations are presented below.

### **Sites AH 4148, AH13053 and AH13054**

Sites AH 4148 and AH13054 are both located at the northern end of Killiecrankie Bay. Site AH 4148 is classified as a shell midden/artefact scatter, with site AH13054 being classified as a shell midden. Site Ki is classified as a shell midden/artefact scatter, and is located along the central portion of Killiecrankie Bay.

The three sites are all situated on the western boundary of the Quoin study area, along the edge of the coastal reserve. All three sites appear to be situated just outside the proposed footprint of the eco-tourism development (see Figure 12).

It is recommended that the three sites should be conserved in-situ, and that management strategies are put in place to ensure that the sites are not impacted by the proposed development. To this end, the following recommendations should be implemented.

- The location of the three sites should be plotted onto planning maps of the Quoin Eco Tourism development.
- Prior to development works commencing, a temporary barricade should be erected around each site. The temporary barricade should be removed at the completion of construction works.
- The eco-tourism development contractors should be made aware of the location of the sites, and informed that the sites are not to be impacted.

If it appears that it will not be possible to conserve any of these sites in-situ then a Permit will be required in order to impact the site/s. A Permit application will need to be prepared and submitted to AHT for assessment prior to any disturbances to the site/s.

### **Site AH13055**

Site AH13055 is located at the northern end of Killiecrankie Bay, around 100m north of site AH13054. The site is classified as an isolated artefact that is located on a graded vehicle track. The site is situated on the western boundary of the Quoin study area, along the edge of the coastal reserve and appears to be situated just outside the proposed footprint of the

eco-tourism development (see Figure 12). The preferred management option is to retain this artefact in its' present location, and to protect the artefact from development impacts. To this end, the following recommendations should be implemented.

- The location of the site should be plotted onto planning maps of the Quoin Eco Tourism development.
- Prior to development works commencing, a temporary barricade should be erected around the artefact. The temporary barricade should be removed at the completion of development works.
- The eco-tourism development contractors should be made aware of the location of the site, and informed that the site is not to be impacted.

If it appears that it will not be possible to conserve this site in-situ then a Permit will be required in order to impact the site. A Permit application will need to be prepared and submitted to AHT for assessment prior to any disturbances to the site.

#### **Site AH 4122**

Site AH 4122 was recorded by Robin Sim in 1989, and is classified as a shell midden site. It is reported as being located on the fore dunes along the central portion of Killiecrankie Bay, at grid reference E572813 N5591484. Despite undertaking an extensive search in the general vicinity of the reported site location, the field team could not find any evidence for this site. The reported location of the site places it on the central to northern section of Killiecrankie Bay, on the front edge of the fore dunes, within the coastal reserve.

The site appears to be situated just outside the proposed footprint of the eco-tourism development. It is recommended that the site should be conserved in-situ, and that management strategies are put in place to ensure that the site is not impacted by the proposed development. To this end, the following recommendations should be implemented.

- The location of the site should be plotted onto planning maps of the Quoin Eco Tourism development.
- Prior to development works commencing, a temporary barricade should be erected around the reported location of the site. The temporary barricade should be removed at the completion of development works.
- The eco-tourism development contractors should be made aware of the location of the site, and informed that the site is not to be impacted.

If it appears that it will not be possible to conserve this site in-situ then a Permit will be required in order to impact the site. A Permit application will need to be prepared and submitted to AHT for assessment prior to any disturbances to the site.

#### **General Recommendations**

- Apart from the four Aboriginal sites dealt with in the above management recommendations, no other Aboriginal features or areas of specific archaeological sensitivity were identified within the Quoin study area. There are therefore no further site or area specific management recommendations that apply to this project.

- If, during the course of the proposed eco-tourism development works, previously undetected Aboriginal heritage sites or objects are located, the processes outlined in the Unanticipated Discovery Plan should be followed (see section 12).
- Copies of this report should be submitted to Aboriginal Heritage Tasmania (AHT) and the Interim Aboriginal Heritage Council (IAHC) for review and comment.

**Table 5: Summary management recommendations for Aboriginal heritage sites located within the Quoin study area**

Site Name	Easting	Northing	Site Type	Management Recommendations
AH13053	572633	5591104	Shell midden/Artefact Scatter	Conserve site in-situ and implement management strategies to ensure that the site is not impacted by the proposed eco-tourism development. If site may be impacted by development then seek Permit.
	572629	5591096		
	572613	5591099		
	572623	5591112		
AH13054	572716	5592068	Shell Midden	Conserve site in-situ and implement management strategies to ensure that the site is not impacted by the proposed eco-tourism development. If site may be impacted by development then seek Permit.
	572726	5592065		
	572742	5592096		
	572711	5592101		
AH13055	572713	5592192	Isolated artefact	Conserve site in-situ and implement management strategies to ensure that the site is not impacted by the proposed eco-tourism development. If site may be impacted by development then seek Permit.
AH4122	572813	5591484	Shell Midden	Conserve site in-situ and implement management strategies to ensure that the site is not impacted by the proposed eco-tourism development. If site may be impacted by development then seek Permit.
AH4148	572590	5592280	Shell midden/Artefact Scatter	Conserve site in-situ and implement management strategies to ensure that the site is not impacted by the proposed eco-tourism development. If site may be impacted by development then seek Permit.
	572590	5592280		
	572590	5592280		
	572590	5592280		



## 12.0 Unanticipated Discovery Plan

The following section describes the proposed method for dealing with unanticipated discoveries of Aboriginal sites and objects. The plan provides guidance to the proponent and contractors so that they may meet their obligations with respect to heritage in accordance with the *Aboriginal Relics Act 1975* and the *Coroners Act 1995*.

Please Note: There are two different processes presented for the mitigation of these unanticipated discoveries. The first process applies for the discovery of all cultural heritage sites or features, with the exception of skeletal remains (burials). The second process applies exclusively to the discovery of skeletal remains (burials).

### Discovery of Cultural Heritage Items

Section 14 (1) of the *Aboriginal Relics Act 1975* states that “*Except as otherwise stated in this Act, no person shall, otherwise than in accordance with the terms of a Permit granted by the Minister on the recommendation of the Director – destroy, damage, deface, conceal or otherwise interfere with a relic.*”

Accordingly, the following processes should be implemented if a suspected relic is encountered.

#### Step 1

If any person believes that they have discovered or uncovered Aboriginal cultural heritage materials, the individual should notify any machinery operators that are working in the general vicinity of the area that earth disturbance works should stop immediately.

#### Step 2

A buffer protection zone of 10m x 10m should be established around the suspected cultural heritage site or items. No unauthorised entry or earth disturbance will be allowed within this ‘archaeological zone’ until such time as the suspected cultural heritage items have been assessed, and appropriate mitigation measures have been carried out.

#### Step 3

Aboriginal Heritage Tasmania (AHT) in Hobart (ph 6233 6613) should be contacted immediately and informed of the discovery. AHT will make necessary arrangements for the further assessment of the discovery. Based on the findings of the assessment, appropriate management recommendations should be developed for the cultural heritage find.

## **Discovery of Skeletal Material**

### *Step 1*

Under no circumstances should the suspected skeletal remains be touched or disturbed. If these are human remains, then this area potentially is a crime scene. Tampering with a crime scene is a criminal offence.

### *Step 2*

Any person discovering suspected skeletal remains should notify machinery operators that are working in the general vicinity of the area that earth disturbing works should stop immediately. Remember health and safety requirements when approaching machinery operators.

### *Step 3*

A buffer protection zone of 50m x 50m should be established around the suspected skeletal remains. No unauthorised entry or earth disturbance will be allowed within this buffer zone until such time as the suspected skeletal remains have been assessed.

### *Step 4*

The relevant authorities (police) will be contacted and informed of the discovery.

### *Step 5*

Should the skeletal remains be suspected to be of Aboriginal origin, then Section 23 of the Coroners Act 1995 will apply. This is as follows:

- 1) The Attorney General may approve an Aboriginal organisation for the purposes of this section.
- 2) If, at any stage after a death is reported under section 19(1), a coroner suspects that any human remains relating to that death may be Aboriginal remains, the coroner must refer the matter to an Aboriginal organisation approved by the Attorney General (In this instance TALSC).
- 3) If a coroner refers a matter to an Aboriginal organisation approved by the Attorney-General –
  - (a) The coroner must not carry out any investigations or perform any duties or functions under this Act in respect of the remains; and
  - (b) The Aboriginal organisation must, as soon as practicable after the matter is referred to it, investigate the remains and prepare a report for the coroner.
- 4) If the Aboriginal organisation in its report to the coroner advises that the remains are Aboriginal remains, the jurisdiction of the coroner under this Act in respect of the remains ceases and this Act does not apply to the remains. In this instance the *Aboriginal Relics Act 1975* will apply, and relevant Permits will need to be obtained before any further actions can be taken.
- 5) If the Aboriginal organisation in its report to the coroner advises that the remains are not Aboriginal remains, the coroner may resume the investigation in respect of the remains.

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## Glossary of Terms

### *Aboriginal Archaeological Site*

A site is defined as any evidence (archaeological features and/or artefacts) indicating past Aboriginal activity, and occurring within a context or place relating to that activity. The criteria for formally identifying a site in Australia varies between States and Territories.

### *Artefact*

A portable object that has been humanly made or modified (see also stone artefact).

### *Assemblage (lithic)*

A collection of complete and fragmentary stone artefacts and manuports obtained from an archaeological site, either by collecting artefacts scattered on the ground surface, or by controlled excavation.

### *Broken Flake*

A flake with two or more breakages, but retaining its area of break initiation.

### *Chert*

A highly siliceous rock type that is formed biogenically from the compaction and precipitation of the silica skeletons of diatoms. Normally there is a high percentage of cryptocrystalline quartz. Like chalcedony, chert was valued by Aboriginal people as a stone material for manufacturing stone tools. The rock type often breaks by conchoidal (shell like) fracture, providing flakes that have hard, durable edges.

### *Cobble*

Water worn stones that have a diameter greater than 64mm (about the size of a tennis ball) and less than 256mm (size of a basketball).

### *Core*

A piece of stone, often a pebble or cobble, but also quarried stone, from which flakes have been struck for the purpose of making stone tools.

### *Core Fragment*

A piece of core, without obvious evidence of being a chunky primary flake.

### *Cortex*

The surface of a piece of stone that has been weathered by chemical and/or physical means.

### *Debitage*

The commonly used term referring to the stone refuse discarded from knapping. The manufacturing of a single implement may result in the generation of a large number of pieces of debitage in an archaeological deposit.

*Flake (general definition)*

A piece of stone detached from a nucleus such as a core. A complete or substantially complete flake of lithic material usually shows evidence of hard indenter initiation, or occasional bending initiation. The most common type of flake is the 'conchoidal flake'. The flake's primary fracture surface (the ventral or inside surface) exhibits features such as fracture initiation, bulb of force, and undulations and lances that indicate the direction of the fracture front.

*Flake fragment*

An artefact that does not have areas of fracture initiation, but which displays sufficient fracture surface attributes to allow identification as a stone artefact fragment.

*Flake portion (broken flake)*

The proximal portion of a flake retaining the area of flake initiation, or a distal portion of a flake that retains the flake termination point.

*Flake scraper*

A flake with retouch along at least one margin. The character of the retouch strongly suggests shaping or rejuvenation of a cutting edge.

*Middens*

Middens range in thickness from thin scatters to stratified deposits of shell and sediment up to 2m thick. In addition to shell which has accumulated as food refuse, shell middens usually contain other food remains such as bone from fish, birds and terrestrial animals and humus from the decay of plant and animal remains. They also commonly contain charcoal and artefacts made from stone, shell and bone.

*Nodules*

Regular or irregular cemented masses or nodules within the soil. Also referred to as concretions and buckshot gravel. Cementing agents may be iron and/or manganese oxides, calcium carbonate, gypsum etc. Normally formed in situ and commonly indicative of seasonal waterlogging or a fluctuating chemical environment in the soil such as; oxidation and reduction, or saturation and evaporation. Nodules can be redistributed by erosion. (See also 'concretion').

*Pebble*

By geological definition, a waterworn stone less than 64 mm in diameter (about the size of a tennis ball). Archaeologists often refer to waterworn stones larger than this as pebbles though technically they are cobbles.

*Quartz*

A mineral composed of crystalline silica. Quartz is a very stable mineral that does not alter chemically during weathering or metamorphism. Quartz is abundantly common and was used by Aboriginal people throughout Australia to make light-duty cutting tools. Despite the often unpredictable nature of fracture in quartz, the flakes often have sharp cutting edges.

### *Quartzite*

A hard silica rich stone formed in a sandstone that has been recrystallised by heat (metaquartzite) or strengthened by slow infilling of silica in the voids between the sand grains (Orthoquartzite).

### *Retouch (on stone tools)*

An area of flake scars on an artefact resulting from intentional shaping, resharpening, or rejuvenation after breakage or blunting of a cutting edge. In resharpening a cutting edge the retouch is invariably found only on one side (see also 'indeterminate retouched piece', 'retouch flake' etc).

### *Scraper*

A general group of stone artefacts, usually flakes but also cores, that one or more retouched edges thought to have been used in a range of different cutting and scraping activities. A flake scraper is a flake with retouch along at least one margin, but not qualifying for attribution to a more specific implement category. Flake scrapers sometimes also exhibit use-wear on the retouched or another edge.

### *Silcrete*

A hard, fine grained siliceous stone with flaking properties similar to quartzite and chert. It is formed by the cementing and/or replacement of bedrock, weathering deposits, unconsolidated sediments, soil or other material, by a low temperature physico-chemical process. Silcrete is essentially composed of quartz grains cemented by microcrystalline silica. The clasts in silcrete bare most often quartz grains but may be chert or chalcedony or some other hard mineral particle. The mechanical properties and texture of silcrete are equivalent to the range exhibited by chert at the fine-grained end of the scale and with quartzite at the coarse-grained end of the scale. Silcrete was used by Aboriginal people throughout Australia for making stone tools.

### *Site Integrity*

The degree to which post-depositional disturbance of cultural material has occurred at a site.

### *Stone Artefact*

A piece (or fragment) of stone showing evidence of intentional human modification.

### *Stone procurement site*

A place where stone materials is obtained by Aboriginal people for the purpose of manufacturing stone artefacts. In Australia, stone procurement sites range on a continuum from pebble beds in water courses (where there may be little or no evidence of human activity) to extensively quarried stone outcrops, with evidence of pits and concentrations of hammer stones and a thick layer of knapping debris.

*Stone tool*

A piece of flaked or ground stone used in an activity, or fashioned for use as a tool. A synonym of stone tool is 'implement'. This term is often used by archaeologists to describe a flake tool fashioned by delicate flaking (retouch).

*Use wear*

Macroscopic and microscopic damage to the surfaces of stone tools, resulting from its use. Major use-wear forms are edge fractures, use-polish and smoothing, abrasion, and edge rounding bevelling.

## **Appendix 1**

### **Gazetteer of Recorded Sites**

**Table 6: Summary details for Aboriginal heritage sites identified as part of the Aboriginal heritage assessment**

Site Name	Easting	Northing	Site Type	Description
AH13053	572633	5591104	Shell midden/Artefact Scatter	<p>Site is located within a small swale on a fore dune that sits immediately above the shoreline of Killiecrankie Bay. The fore dune has formed over the top of an extensive outcropping of calcarenite limestone that extends along this section of the beach. A sparse scatter of shell material and three stone artefacts was identified across the 15m x 15m swale.</p> <p><i>Artefact details</i></p> <ul style="list-style-type: none"> <li>- White quartz flake 36mm x 21mm x 20mm</li> <li>- White quartz flake 41mm x 16mm x 8mm</li> <li>- Grey igneous manuport 116mm x 77mm x 30mm</li> </ul>
	572629	5591096		
	572613	5591099		
	572623	5591112		
AH13054	572716	5592068	Shell Midden	<p>Site is located at the northern end of Killiecrankie Bay, at the point where the sandy beach line interfaces with an extensive series of inter-tidal granite rock platforms.</p> <p>The site is situated on a the low lying fore dunes that fringe this section of the bay, and is around 30m inland (east) of the high tide mark. A very sparse and fragmented scatter of shell material was identified across an area measuring approximately 40m (north-south) x 25m (east-west).</p>
	572726	5592065		
	572742	5592096		
	572711	5592101		
AH13055	572713	5592192	Isolated artefact	<p>The site is located at the northern end of Killiecrankie Bay, at the point where the sandy beach line interfaces with an extensive series of inter-tidal granite rock platforms.</p> <p>The artefact was identified on a graded vehicle track that runs in a north-south direction, parallel to the coastline of Killiecrankie Bay. The section of track where the artefact was identified was located around 30m inland from the high tide mark, at a point where the track traverses a broad east-west trending gully.</p> <p><i>Artefact Details</i></p> <p>Brown meta sandstone flake 54mm x 35mm x 12mm</p>
AH4148	572590	5592280	Shell midden/Artefact Scatter	<p>The site is located at the northern end of Killiecrankie bay, approximately 40m inland (east) of the high tide mark, on a low relief fore- dune that is interspersed with granite outcroppings. The coastline in this area is comprised of a series of granite rock outcroppings that extends into the inter-tidal zone, forming a series of small protected gulches.</p> <p>A sparse scatter of shell material and three stone artefacts were identified across an area measuring approximately 10m x 10m.</p> <p><i>Artefact details</i></p> <ul style="list-style-type: none"> <li>- White quartz flake 59mm x 30mm x 7mm</li> <li>- White quartz flake 44mm x 61mm x 11mm</li> <li>- White quartz flake 26mm x 24mm x 10mm</li> </ul>
	572590	5592280		
	572590	5592280		
	572590	5592280		

## **Appendix 2**

### **Detailed Descriptions for Aboriginal Heritage Sites**

**Site Name: AH13053**

**Site Type: Artefact scatter/Shell Midden**

**Grid references: (GDA 94)**

- E572633 N5591104
- E572629 N5591096
- E572613 N5591099
- E572623 N5591112

### **Site Description**

Site AH13053 is classified as a shell midden with an associated scatter of stone artefacts. The site is located within a small swale on a fore dune that sits immediately above the shoreline of Killiecrankie Bay. The fore dune has formed over the top of an extensive outcropping of calcarenite limestone that extends along this section of the beach. The swale area measures approximately 15m x 15m, and extends out to the edge of the limestone outcrop, at a height of approximately 3m above the beach.

This part of Killiecrankie Bay has a sandy shoreline. The sands interface with rock platforms around 500m to the north of the site.

A sparse scatter of shell material was identified across the 15m x 15m swale. Limpet and wherrina were the main shell species present, with the shell material being highly fragmented. No lenses of shell material were apparent at the site. Nor was there any evidence for midden stratification. Small fragments of bone material was also present in the swale. Species identification was not possible, although it is potentially seal bone.

Three stone artefacts were also identified within the swale. Two of these artefacts were white quartz flakes. The third artefact was a rounded igneous manuport.

The shell material and stone artefacts are located within a deflated dune context, with the sand deposits within the swale area has been eroded out to reveal the underlying paleo sands and bedrock limestone. Surface visibility within the swale was excellent (90%). Beyond the swale, surface visibility was restricted to 20% due to vegetation cover. Deep sand dune deposits also exist in the area surrounding the swale. It is possible that the site is larger than the recorded extent, and extends beneath the surrounding sand dune deposits.

### **Artefact details**

- White quartz flake 36mm x 21mm x 20mm
- White quartz flake 41mm x 16mm x 8mm
- Grey igneous manuport 116mm x 77mm x 30mm



Plate 1: View west at site AH13053



Plate 2: View east at site AH13053



**Site Name: AH13054**

**Site Type: Shell Midden**

**Grid references: (GDA 94)**

- E572716 N5592068
- E572726 N5592065
- E572742 N5592096
- E572711 N5592101

### **Site Description**

Site AH13054 is classified as a shell midden deposit. The site is located at the northern end of Killiecrankie Bay, at the point where the sandy beach line interfaces with an extensive series of inter-tidal granite rock platforms.

The site is situated on a the low lying fore dunes that fringe this section of the bay, and is around 30m inland (east) of the high tide mark. This is right on the western edge of the study area boundary, at the point where it transitions with coastal reserve. A small ephemeral drainage gully runs in a westerly direction down from the slopes of Mount Killiecrankie, and empties onto the beach around 100m to the north of the site.

A very sparse and fragmented scatter of shell material was identified across an area measuring approximately 40m (north-south) x 25m (east-west). The main shell species represented in the deposit are abalone and limpet. No lenses of shell material were identified in this area, and there was no evidence for midden stratification. The sand deposits in this area are typically quite shallow, with granite outcrops exposed to the surface across parts of the site. Given these shallow deposits, it is unlikely that stratified midden deposits are associated with this site. No stone artefacts were identified in this area.

Surface visibility across the site area was generally fair, averaging around 40%. The main impediment to surface visibility was vegetation cover in the form of coastal scrub. Given the constraints in visibility, it is possible that additional undetected midden material is associated with this site.

The site is generally in good condition, with little evidence for disturbance. An old vehicle track does terminate just to the east of this site. However, this track does not appear to have been used for some time, and is partially overgrown with vegetation.



Plate 1: View north at site AH13054



Plate 2: Sample range of shell midden material from site AH13054

**Site Name: AH13055**

**Site Type: Isolated Artefact**

**Grid references: (GDA 94) E572713 N5592192**

### **Site Description**

Site AH13055 is classified as an isolated artefact. The site is located at the northern end of Killiecrankie Bay, at the point where the sandy beach line interfaces with an extensive series of inter-tidal granite rock platforms.

The artefact was identified on a graded vehicle track that runs in a north-south direction, parallel to the coastline of Killiecrankie Bay. The section of track where the artefact was identified was located around 30m inland from the high tide mark, at a point where the track traverses a broad east-west trending gully that runs down from the slopes of Mt Killiecrankie. This gully is drained by a small creek line that empties into Killiecrankie Bay. The artefact is around 20m south of the creek. This is right on the western edge of the study area boundary, at the point where it transitions with coastal reserve.

Surface visibility on the 4m wide vehicle track was excellent (90%). Off the track surface visibility was reduced to around 20-30% due to vegetation cover (coastal scrub). Given these constraints it is possible that additional artefactual material is associated with this site. Based on the surface expression, artefact densities would be expected to be sparse.

### **Artefact Details**

Brown meta sandstone flake 54mm x 35mm x 12mm



Plate 1: View north at site AH13055



Plate 2: Isolated artefact from site AH13055

**Site Name: AH 4148**

**Site Type: Artefact scatter/Shell Midden**

**Grid references: (GDA 94)**

- **E572590 N5592280**
- **E572592 N5592286**
- **E572578 N5592290**
- **E572578 N5592280**

### **Background**

Site AH 4148 was originally recorded by Robin Sim in 1989 as part of a general reconnaissance survey of parts of Flinders Island. The site was described as a shell midden deposit that was located, abutting the shoreline at the northern end of Killiecrankie Bay. The location provided for this site places it at grid reference E572613 N5592284. The original site card for AH 4148 is presented in Appendix 3 of this report.

### **Present Site Description**

During the course of the present survey assessment, a shell midden/artefact scatter was identified in the immediate vicinity of the reported location of site AH 4148. Given the close spatial proximity, the artefactual material identified during the present survey was assessed as being a component of this site.

The site is located at the northern end of Killiecrankie bay, approximately 40m inland (east) of the high tide mark, on a low relief fore- dune that is interspersed with granite outcroppings. This is right on the western edge of the study area boundary, at the point where it transitions with coastal reserve. The coastline in this area is comprised of a series of granite rock outcroppings that extends into the inter-tidal zone, forming a series of small protected gulches.

A sparse scatter of shell material was identified across an area measuring approximately 10m x 10m. The shell material was highly fragmented, making species identification difficult. Limpets were the only species that could be positively identified. Three stone artefacts (all quartz flakes) were also identified in this area.

No lenses of shell material were identified in this area, and there was no evidence for midden stratification. The sand deposits in this area are typically quite shallow, with granite outcrops exposed to the surface across parts of the site. Given these shallow deposits, it is unlikely that stratified midden deposits are associated with this site.

Surface visibility across the site area was generally fair, averaging around 40%. The main impediment to surface visibility was vegetation cover in the form of coastal scrub. Given the constraints in visibility, it is possible that additional undetected midden material is associated with this site.

The site is generally in good condition, with little evidence for disturbance. An old vehicle track runs just to the east of this site. However, this track does not appear to have been used for some time, and is partially overgrown with vegetation.

**Artefact details**

- White quartz flake 59mm x 30mm x 7mm
- White quartz flake 44mm x 61mm x 11mm
- White quartz flake 26mm x 24mm x 10mm



Plate 1: View north west at site AH 4148

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Plate 2: View south-east at site AH 4148



Plate 3: Artefact associated with site AH 4148