

A report of an Aboriginal archaeological survey of the Bundanon Trust properties



Prepared for the Bundanon Trust

by

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August 2011

Front page: Axe grinding grooves on Eearie Park (Photo courtesy Jim Walliss)

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1 Introduction

1.1 Background

The Bundanon Trust commissioned an Indigenous Cultural Heritage Management Plan ('the plan') as part of a broader planning process to guide future developments on the Trust properties of Bundanon, Riversdale and Earie Park, on the Shoalhaven River, west of the south coast town of Nowra. Compiling the plan involved extensive historical research, compilation of information from previous oral history research, review of previous archaeological research in the region, and a systematic archaeological investigation of the Bundanon Trust properties.

Preparation of the Indigenous Cultural Heritage Management Plan for the Bundanon Trust Properties, undertaking systematic archaeological surveys and developing a predictive model are considered to have met the statutory Due Diligence requirements for protection of Aboriginal objects (DECCW 2010).

The archaeological investigation involved fieldwork over four separate days between November 2010 and January 2011, during which several definite and potential sites were found. Areas of high archaeological potential were also identified. The results of the survey suggest that the properties were used only infrequently in pre-contact times, possibly because they are located at the upper limit of tidal influence on the Shoalhaven River, perhaps representing a transition area between coastally oriented and inland oriented traditional Wandandian clan groups. Alternatively, regular flooding of the river may have repeatedly washed away sites located in the riparian zone.

The Nowra Local Aboriginal Land Council was consulted regarding the plan and a sites officer participated in the fieldwork. Staff of the Bundanon Trust were kept informed of the progress of the survey and provided useful anecdotal information on potential site locations.

This archaeological survey report is Appendix 1 to the Indigenous Cultural Heritage Management Plan for the Bundanon Trust Properties (Feary and Moorcroft 2011), however it has been written to also be read as a stand-alone document, although it does not contain a detailed description of previous archaeological research, which can be found in the plan.

1.2 Aims

The main aim of the archaeological field survey was to inform development of an Indigenous Cultural Heritage Management Plan for the Bundanon Trust properties. To achieve this aim, the following actions comprised the field investigation:

- review of the Department of Environment, Climate Change and Water (DECCW) Aboriginal Heritage Information Management System (AHIMS) database and to identify any previously recorded sites on the properties
- design and implement a field survey for undertaking systematic archaeological investigation to locate and record Aboriginal sites on the properties
- field test a predictive model developed during previous site surveys in the lower Shoalhaven region
- assess areas identified by the Trust for potential development
- follow up anecdotal information on possible Aboriginal sites
- consult with the Nowra Local Aboriginal Land Council

1.3 Survey location

The survey was carried out on the Bundanon Trust properties, which are located on the northern side of the Shoalhaven River, two hours drive from Sydney and about 20 kms by road west of the regional town of Nowra (Figure 1).

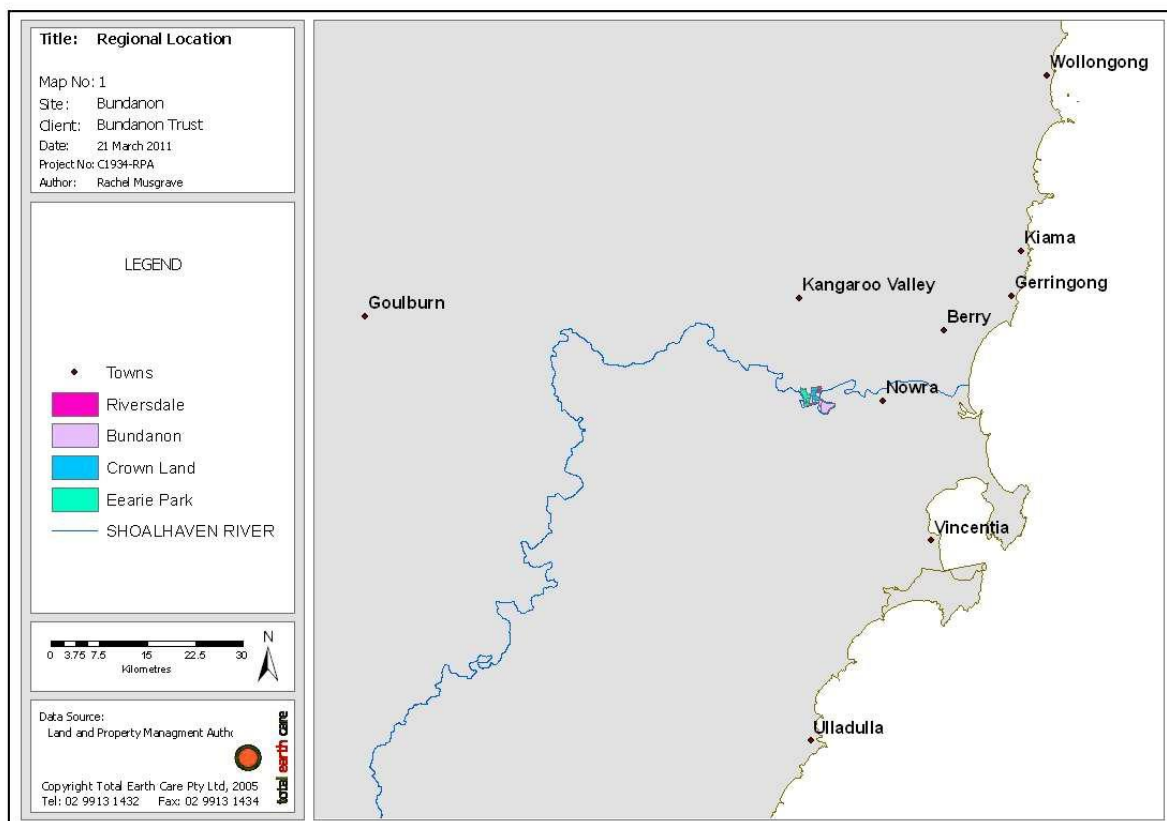


Figure 1: Locality map

The study area includes the Bundanon Trust properties and the surrounding riverine and hinterland environment. The Bundanon Trust properties are located within a rural landscape towards the upper tidal limit of the Shoalhaven River which flows out to the sea at Shoalhaven Heads. The properties include: Bundanon, Riversdale, Eearie Park 1 and Eearie Park 2 (managed in sympathy with the other properties). In total the properties amount to 1100 ha in size (Figure 2). Much of the blue coloured crown land shown on the map in Figure 2 is under permissive occupancy to the Trust and is also subject to Aboriginal land claims by the Nowra Local Aboriginal Land Council under *the NSW Aboriginal Land Rights Act 1983*. Much of the vegetated country south of the river and north of the properties is protected in nature reserves and national parks, managed by the NSW National Parks and Wildlife Service.

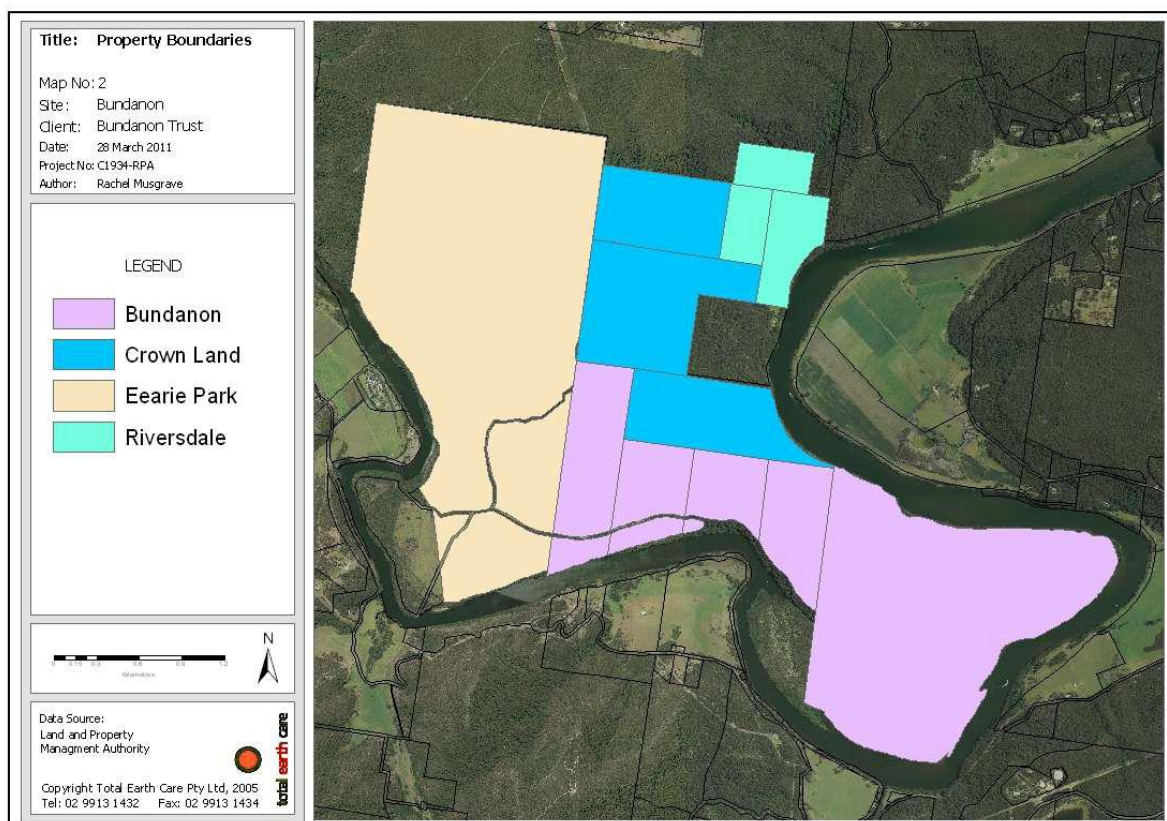


Figure 2: Map of the lower Shoalhaven region showing Bundanon Trust properties

2 Environmental setting

The Bundanon Trust properties are located on the northern banks of the Shoalhaven River at the southern edge of the Sydney Basin Bioregion. The properties are situated in an area which represents an overlap zone between the plateau hinterland of the upper Shoalhaven region and the coastal floodplains of the lower Shoalhaven, with a sharp contrast between the rugged and steep

river gorges forming the western and northern backdrop, and the gently sloping to flat river terraces further east and downstream of the properties.

The topography is dominated by steep escarpments and outcrops in the northern and western portions of the properties, undulating slopes with several small creek lined valleys falling to terraces and floodplain along the southern and eastern portions adjacent to the river. The escarpment and outcrop portions of the properties encompass a number of large rock platforms on the western plateau with expansive rock overhangs below. Some of these rock shelters and overhangs have views down to the river and beyond. The creek valleys include steep upstream sections with occasional rock benches in the creeks themselves. The creeks widen as the valleys open up downstream prior to draining into the Shoalhaven River. The properties are located immediately downstream of the tidal limit of the Shoalhaven River at Burrier Crossing.

2.1 *Geology and soils*

The properties are located towards the southern end of the Sydney Basin geological formation. The underlying geological units of the area encompassing the properties all belong to the Permian Age sandstones and siltstones of the Shoalhaven Group (formed between 270-250 million years before present) and are: Nowra Sandstone; Snapper Point Formation; and Wandrawandian Siltstone. Differential erosion of the sediments within the sandstones has formed deep rock overhangs, once attractive to Aboriginal people as places to camp or to do paintings on the walls. The riverine flats and terraces of the properties have quaternary alluvium deposits overlaying the Permian geological units (Total Earth Care PL 2011).

2.2 *Vegetation*

Vegetation on the riverine flats and terraces of the properties has been significantly cleared by non-Indigenous settlers for improved pastures. Infestations of the noxious weed lantana cover much of the lower and mid slopes. In some places the infestations are impenetrable. However, areas of the lower escarpment, steep upper slopes and upper creek lines, as well as the plateau and high escapement areas are dominated by native vegetation. The plateau vegetation is characterized by open woodland. The steep upper slopes and creek lines are open forest with some rainforest species associated with the creek lines. There is evidence of previous forestry activity in some areas.

2.3 *Climate*

The climate of the lower Shoalhaven region is meso-thermal. It has warm summers and cold winters and has relatively uniform seasonal rainfall. Summer temperatures range from 16.1°C to 25.8°C and

winter temperatures from 6.2°C - 15.8°C. The mean annual rainfall of 1143 mm is relatively uniformly distributed throughout the year.¹

2.4 *Geomorphology and hydrology*

The Shoalhaven River, together with its steep sandstone gorges, alluvial terraces and floodplains, is the defining natural feature of the region. As well as being a constant source of inspiration for Arthur Boyd's paintings, the river's presence has deeply influenced human settlement for thousands of years. From its source in rugged terrain south of Braidwood, on the southern tablelands, the river flows approximately 300 kms in a generally north-easterly direction to reach the ocean at Shoalhaven Heads, east of Nowra. The Shoalhaven estuary and floodplain area is one of the most extensive and diverse in south-eastern NSW and extends 50 kms upstream from the ocean.² The Bundanon Trust properties are located close to the most upstream reach of the estuary, at Burrier. Here, the water is strongly affected by freshwater flows from the catchment (from small freshes to major floods). Tidal circulation is strongly attenuated and salinity may be reduced for extended periods after major runoff events. This section may also become quite saline and carry large numbers of jellyfish in extended warm dry periods. The Shoalhaven River Estuary Management Plan notes that some landscapes in this section of the river have significant cultural (visual amenity) and natural value, and prescribes high levels of protection (Shoalhaven City Council 2008).

The character of the Shoalhaven River estuary and its coastal floodplain are not static and there is abundant geomorphic evidence in riverbank sediment profiles for a highly variable and dynamic system. Indeed the human history of settlement in the lower Shoalhaven has been one of adapting and responding to catastrophic flooding wrought by the river. Flood histories prior to establishment of dams suggest that flooding occurred around every ten years, with the 1870 flood rising to a height of 6.7 metres (Antill 1982). This would have had a profound influence on Indigenous patterns of movement and settlement.

The depositional and erosional processes associated with flooding have also greatly impacted on the preservation and delectability of certain site types, such as stone artefact scatters.

¹ See Bureau of Meteorology website <http://www.bom.gov.au>

² <http://www.oceanwatch.org.au/wp-content/uploads/2010/02/CS1-Shoalhaven-Catchement.pdf>

3 Aboriginal consultation

The Trust properties fall within the jurisdiction of the Nowra Local Aboriginal Land Council (Nowra LALC). As the archaeological survey was part of the Indigenous Heritage Management Plan, it was undertaken in accordance with the brief for the plan, which was to consult only with the Nowra LALC at this stage. Neither the plan nor the archaeological surveys are associated with any immediate development proposals and no Aboriginal Heritage Impact Permits are being sought at the time of writing. The DECCW *Aboriginal cultural heritage consultation requirements for proponents 2010* were therefore not followed for this investigation.

Steps in the consultation process with the LALC are shown in Table 1.

Table 1: Log of consultation with Nowra LALC

Date	Activity
13/10/2010	Initial contact with Nowra LALC via formal letter and follow up telephone
25/11/2010	Meeting with Board and tabling of a plain English report on the proposed plan and field survey
3/12/2010 13/1/2011	Fieldwork with Graham Smith, Nowra LALC sites officer
5/3/2011	Organised a field day for Nowra LALC participants (cancelled)
7/3/2011	Progress report sent to Nowra LALC and letter requesting a meeting and feedback.
17/3/2011	Phone call to CEO; he will speak with Board members about getting feedback on the report. None received.

4 Previous archaeological research

Reports on relevant previous archaeological research and AHIMS databases were reviewed to develop an understanding of the nature and extent of the archaeological record on the properties and in the surrounding area. According to the information held by DECCW no surveys have been conducted on the properties and no Aboriginal sites are recorded on any of the properties.³

However, a considerable amount of archaeological investigation has been conducted in the broader region, including excavations, and sophisticated predictive modelling, as well as surface surveys and

³ DECCW (now the Office of Environment and Heritage) is the statutory authority for Aboriginal heritage protection in NSW and holds the official register of recorded sites and an extensive catalogue of reports of archaeological investigations.

salvage operations. Section 10.2 and Appendix 2 of the Indigenous Cultural Heritage Management Plan contain detailed listings and analysis of previous archaeological research in the lower Shoalhaven valley.

Although no sites are recorded on AHIMS, two sites are known to occur on the properties. Both sites are axe grinding grooves, occurring on sandstone platforms in narrow creek valleys. One comprises a single groove and the other is five parallel grooves, both found several years ago by local resident Jim Walliss. It was not possible to visit either of these sites, but knowledge of the location of these sites has informed the sampling design for this field survey.

5 Archaeological survey methodology

5.1 *Sampling design*

Because of the size of the survey area, a comprehensive 100% ground coverage survey was not possible. Instead a programme of systematic sampling was designed and implemented, aimed at characterising the archaeological signature and generating sufficient data to assess the significance of individual sites and to enable reliable estimates of where and what types of sites may be located in the remaining unsurveyed areas.

Even if survey is limited in areal extent, or inhibited by poor ground visibility, if appropriately designed, it enables reasonably accurate predictions to be made about the type and location of unrecorded sites in relation to key environmental variables such as distance from water. This information is useful for deciding on approaches to be taken for areas identified for future development.

The field survey was also used to test previously constructed predictive models of archaeological site location in the region, for example a model developed by Clarke and Kuskie (2006) for the lower Shoalhaven valley.

The sampling design considered a range of factors. These included logistical factors such as access or ground visibility, through to theoretical models of traditional hunter-gatherer resource optimization. Generally, the sampling design was constructed from syntheses of previous archaeological research conducted in the region, distribution patterns of known sites recorded on heritage databases, indigenous and non-indigenous local knowledge and anecdotal information, and disturbance/land use history.

There is substantial archaeological data, built up over many decades of archaeological research across Australia that demonstrates a relationship between certain environmental variables and the

presence of certain types of sites. While in no way diminishing the role of cultural and social factors in determining where Aboriginal people may have lived and camped, these environmental correlates are a valuable heuristic device when designing a sampling strategy.

The properties contain very distinctive landforms, due to the influence of geology and river hydrology. The sampling design identified six 'archaeological landform' units on the properties and the types of sites likely to be present in each unit is as follows:

- *High flat plateaux*: are mostly likely to contain stone arrangements and axe grinding grooves (if there is a water source nearby).
- *Escarpments and upper slopes*: may contain axe grooves in creeks if there are flat areas of fine grained sandstone. Art sites and rock shelters with cultural deposits may be present if there are overhangs suitable for camping in and food and water are readily available.
- *Moderately steep mid slopes and creek lines*: may contain axe grooves in creeklines, rockshelters in small escarpments, scarred trees if mature forest present, stone arrangements on flat sandstone areas, artefact scatters along ridgelines and saddles.
- *Lower slopes and lower escarpments*: have the greatest potential for containing sites, including art sites, axe grooves and rockshelters with deposits. Open campsites with stone artefacts may occur on flat areas and toe slopes. Scarred trees may be present if mature forest is extant.
- *River flats and terraces*: may contain campsites of stone artefacts, scarred trees, burials and bora grounds, axe grooves (where sandstone outcrops are present). Regular flooding over thousands of years may have removed and/or re-deposited material evidence.
- *Prominent natural features (such as hills or special river bends)*: may have mythological or spiritual values, but these can only be determined through oral history research and/or from the historical records.

Aboriginal people would have carried out innumerable activities that have left no physical trace, such as places where resources were gathered for weaving baskets or where young people were educated. Information about these can come only from oral history research or from the historical records.

5.2 Fieldwork methods

Using topographical maps and with assistance from the Trust's Property Manager Henry Goodall, locations for transects were drawn up for each of the main landform units described above, with the intent of sampling all landform units. A transect to test the sampling design was conducted on 26

November 2010 with Trust staff, when an axe grinding groove site and a possible pebble tool were located in a creek on Eearie Park (see Table 2).

Transect sampling was carried out in each of the landform units by a team of three people (Sue Feary, Heather Moorcroft and Graham Smith). Two days of land based field survey were undertaken with Graham Smith, the Nowra LALC's nominated sites officer, on 3 December 2010 and 13 January 2011. (Graham is from the north coast, although he has lived in the Shoalhaven for over 30 years. He is very experienced and astute in regard to finding sites.). Generally the team spread out laterally along the transect route, checking all bare ground, likely rock overhangs, flat sandstone slabs and mature trees. The transects were generally determined by the presence of existing or old vehicle tracks or walking tracks, as ground visibility outside these disturbed areas was virtually non-existent. All likely rock overhangs, bare ground and flat sandstone outcrops were examined for several metres each side of the tracks. Large outcrops of flat sandstone on plateaux and in creeks were given special attention due to their potential to contain stone arrangements and/or axe grooves. In some locations, lantana was almost impenetrable, making field survey very difficult (Figure 3).



Figure 3: Looking over lantana infested lower slopes, Bundanon

The final transect was by boat on 21 January 2011, along the river between Riversdale (launching from Watersleigh) and Eearie Park, ending at the 'Burrier Crossing'. All major river cuttings and river terraces were inspected for artefact scatters and evidence for burials. This work was undertaken with the assistance of local DECCW staff and their boat.



Figure 4: Inspection of river cuttings for stratified cultural deposits

Figures 5, 6, 7, 8 and 9 are aerial maps showing locations of transects together with all sites found. Figure 10 shows all transects for the properties. Table 2 provides environmental and archaeological information about each transect. A total of 12 kilometres of transect was walked by three people, each with a visual scan of two metres, giving a transect width equivalent to 6 metres. Several transects consisted of intensive coverage of a targeted area rather than a linear survey (see Figures 5 - 8).

Although the surveyed area is small relative to the size of properties, the coverage included all five landform units and focused on areas considered highly likely to contain sites. The 15 km long river transect (see Figure 9) involved examination of 11 separate river bank exposures, with a total coverage of approximately 2 square kilometres.

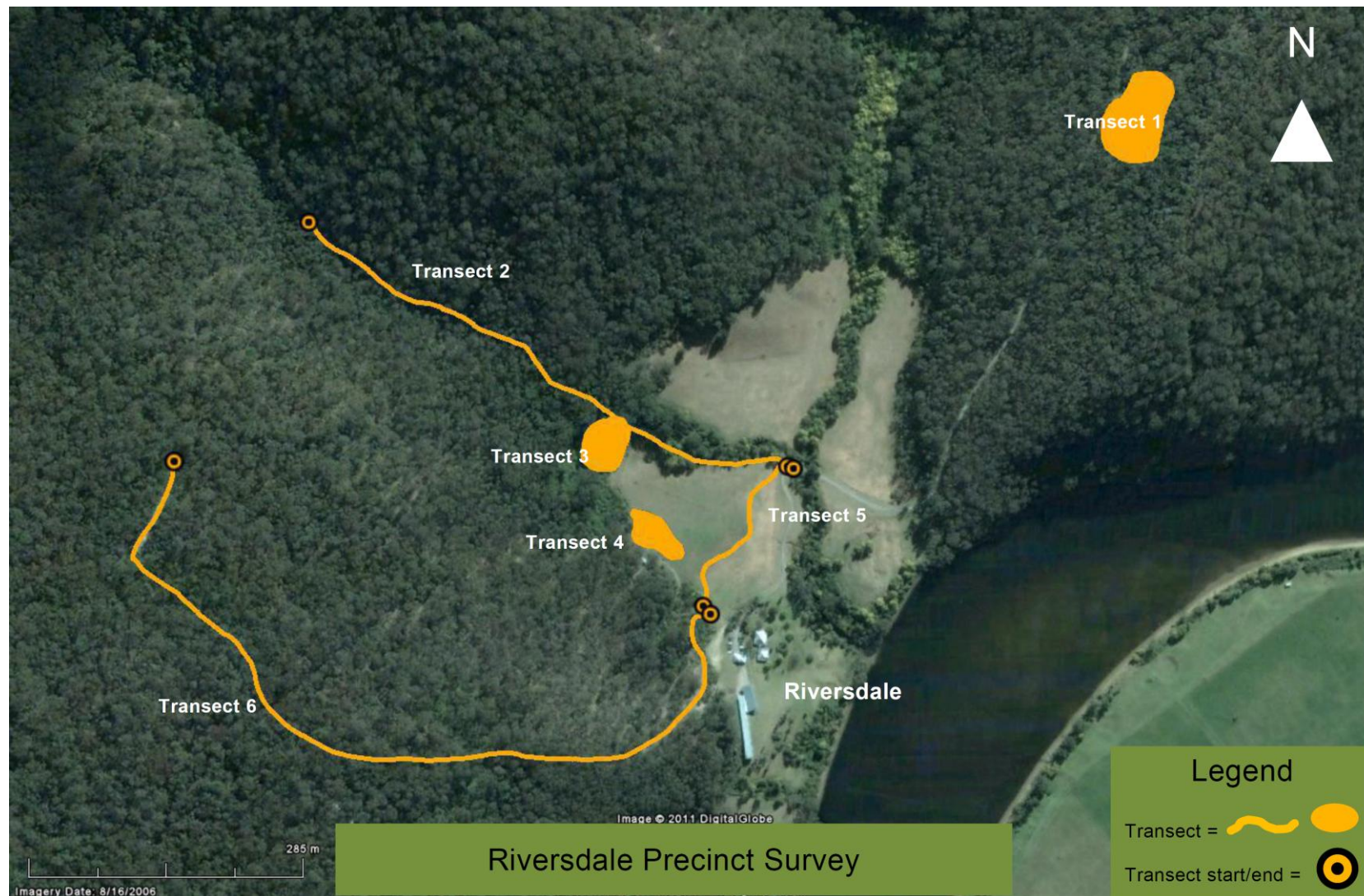


Figure 5: Riversdale Precinct Survey

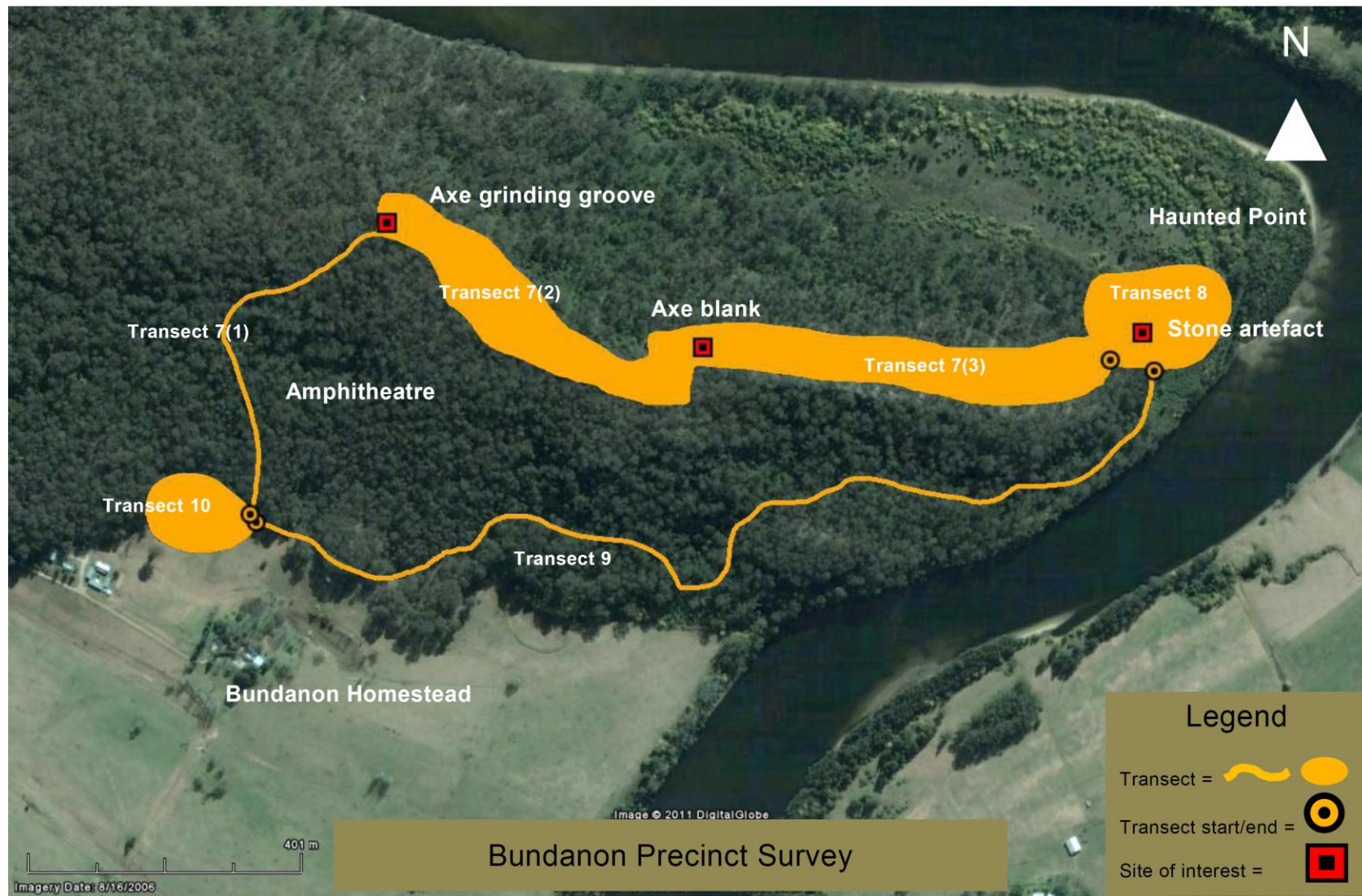


Figure 6: Bundanon Precinct Survey

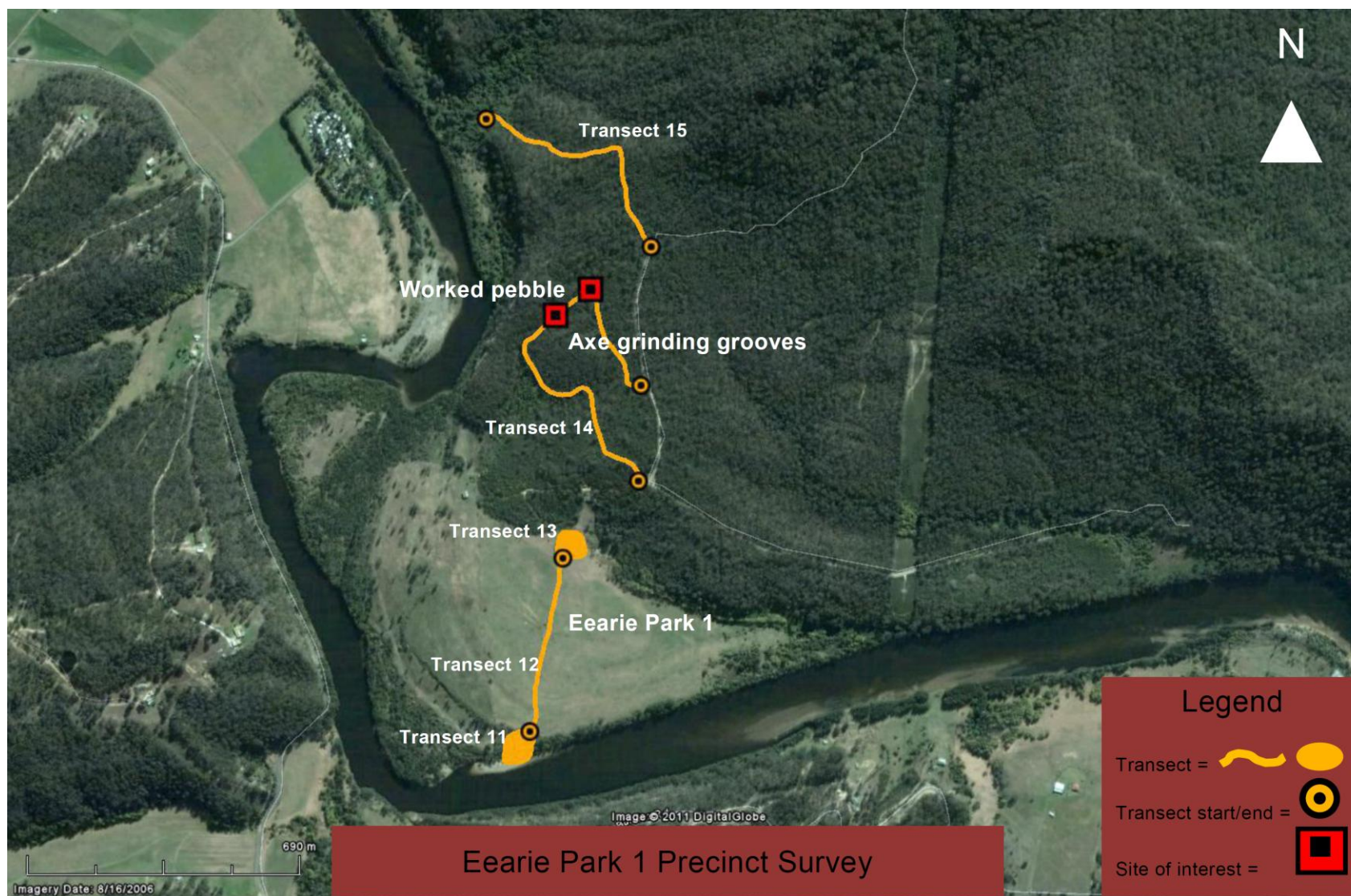


Figure 7: Eearie Park 1 Precinct Survey

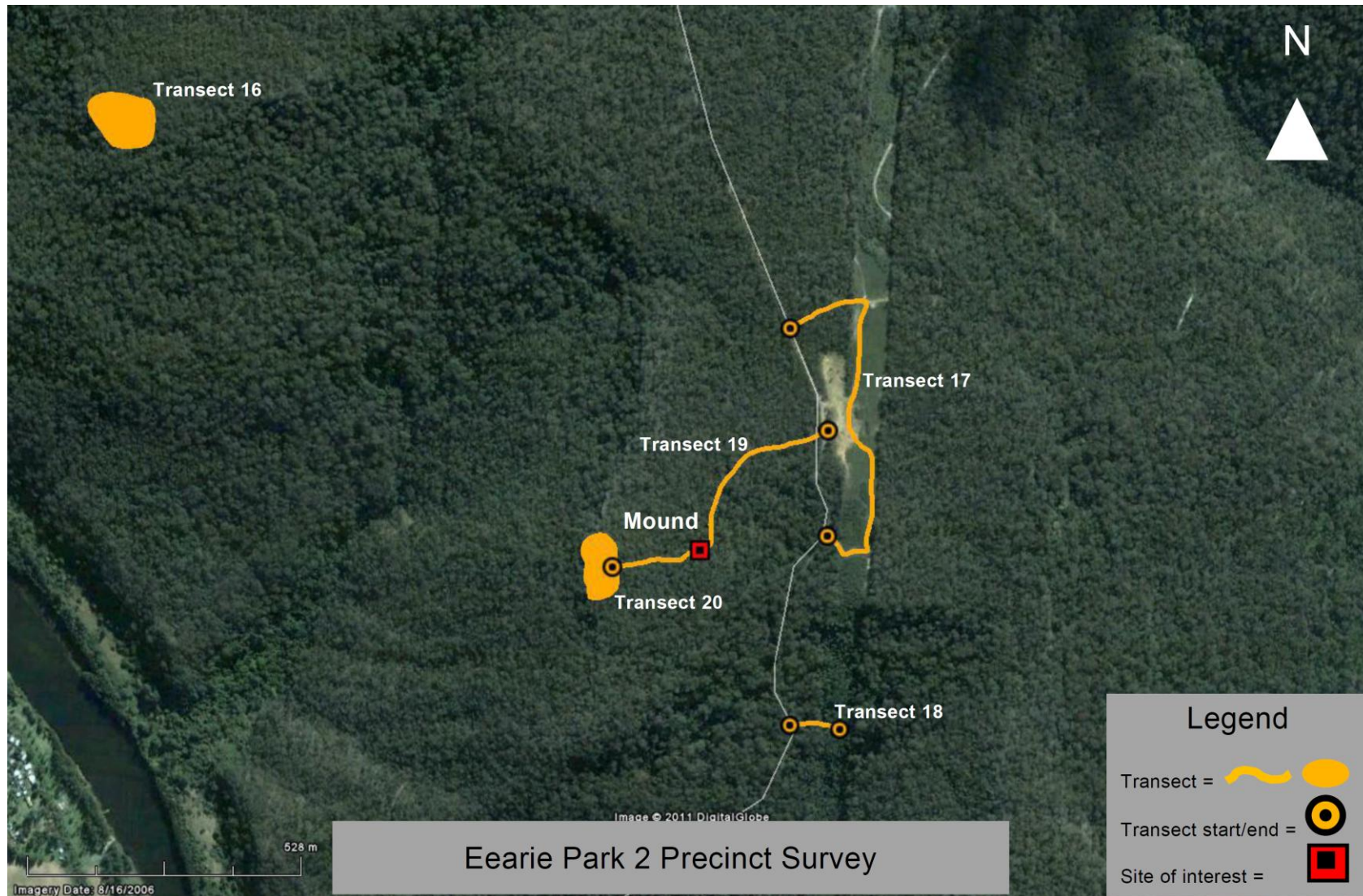


Figure 8: Eearie Park 2 Precinct Survey

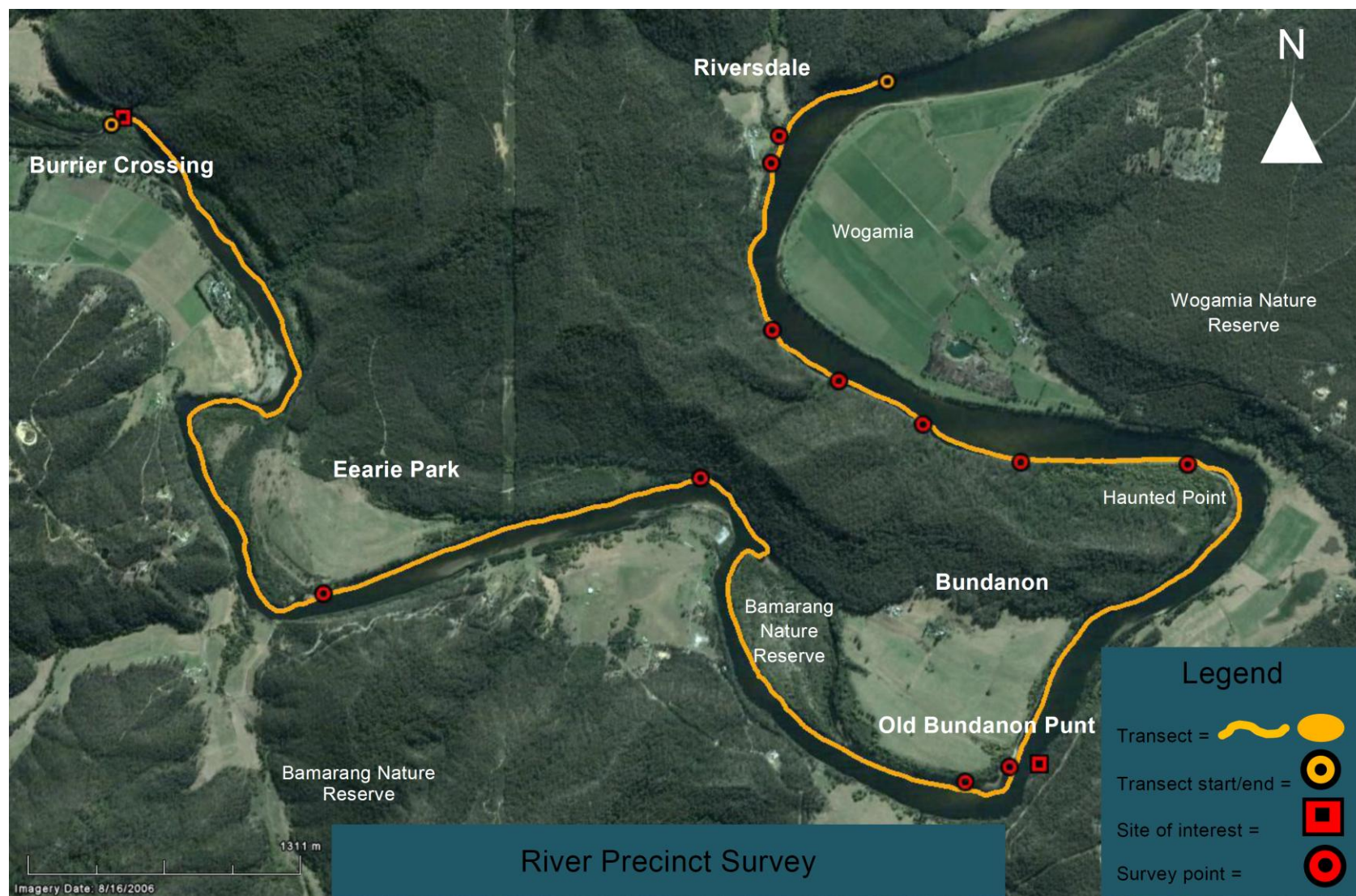


Figure 9: River Precinct Survey

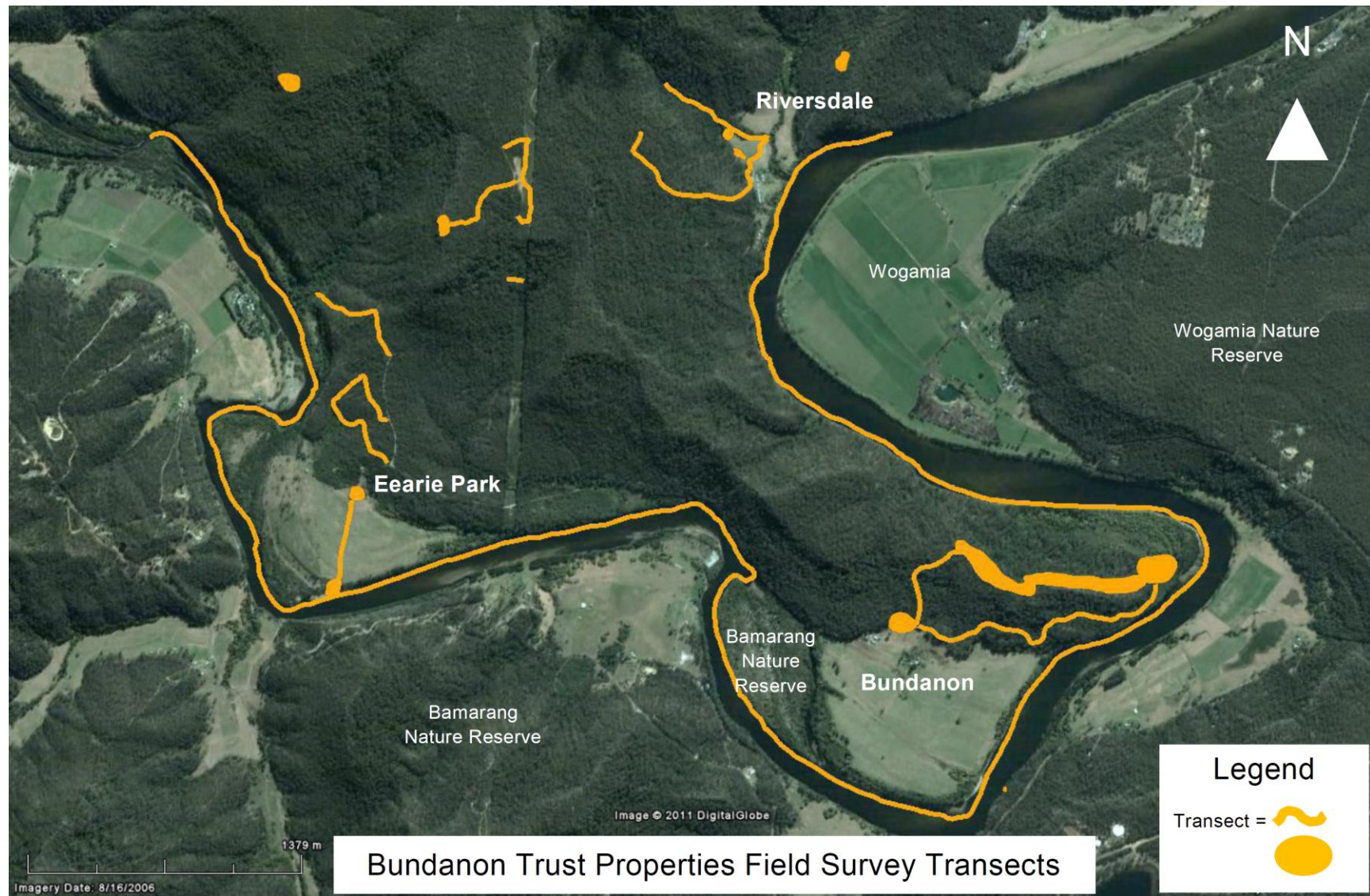


Figure 10: Bundanon Trust Properties Field Survey Transects

Table 2: Transect data

Transect no./precinct	Transect name	Date	Archaeological	Environmental description	Landform unit	Transect length(m)	Sites recorded
1/Riversdale	Rocky outcrops, Riversdale Road	26/11/2010	Medium/high in rock overhangs, with flat dry floors	Escarpment eastern side of road, skeletal soils, open forest, grassy understorey. Numerous rock overhangs.	Mid-slope	450	No sites
2/Riversdale	Riversdale western tributary walk	3/12/2010	High for axe grinding grooves Medium/high for artefact scatters adjacent to creek at eastern end	Narrow steep creekline, with water, boulder in creeks, also flat benches. Flats either side of creek in some locations, infested with lantana	Lower slopes/creeklines	580	No sites
3/Riversdale	Riversdale Creek flat	3/12/2010	Medium for artefact scatters Medium for axe grooves in creek	Western side of creekline, low river flats, possibly flood prone, heavy lantana infestation, some cleared	Lower slopes/creeklines	184	No sites
4/Riversdale	Riversdale septic tank site	3/12/2010	High for artefact scatters	20x10 m cleared area for septic tanks, gently sloping-flat above western creekline. Other exposed areas with natural gravels	Lower slopes/high terraces	160	No sites
5/Riversdale	Riversdale paddocks and lower creek	3/12/2010	Medium for artefact scatters on flat ground above flood zone	Gently undulating above creeklines, cleared and grassed, some exposed ground	Lower slopes	270	No sites
6/Riversdale	Riversdale Fire trail	3/12/2010	High for artefact scatters on flat benches and saddles	Disused fire trail south of buildings generally sloping with wide flat areas at saddles, and benches. Rocky ridges and knolls	Lower slopes/creeklines	1000	No sites

			High for stone arrangements/lookout areas, artefact scatters along tops of ridges	overlooking river and sloping ground beside track.			
7(i)/Bundanon	Amphitheatre walk to top of ridge	13/1/2011	High for artefact scatters on flat sections of track, especially at intersection of amphitheatre track with track to top of ridge High for rockshelters in rocky sandstone outcrops on slopes facing river	Existing walking/vehicle track, gently sloping, flat in places, benched in places, heavy leaf litter. Passes through a range of vegetation types, spotted gum forest with burrawang understorey, grading up into <i>Casuarina</i> . Many sandstone outcrops along contours. Towards top, many open grassy patches. Head of valley.	Upper slopes/creeklines	450	No sites
7(ii)/Bundanon	Ridgeline transect	13/1/2011	High for rockshelters Medium for artefact scatters	Old track follows top and side of ridge eastward. Rock overhangs in bluffs looking over river to N/NE. Wide flat ridge at beginning of transect, grassy understorey, very open (previous clearing?)	Upper slopes/escarpment	1100	1 axe groove 1 broadheaded snake
7(iii)/Bundanon	Ridge top to Haunted Point	13/1/2011	High for artefact scatters on flat areas of ridgeline and flat areas closer to river High for rockshelters Medium for scarred trees where mature forest	Followed ridgeline down to river; then followed contours to avoid lantana, open woodland grassy understorey, rock overhangs along contours	Upper/mid/lower slopes	870	1 possible axe blank (found previously and left in a prominent location by Total Earth Care team)

8/Bundanon	Haunted Point	13/1/2011	Very high for artefact scatters	30 x 30 metre cleared area, surrounded by regenerating Acacia, gently sloping to flat, on large bend in river and above most floods. Gravels and sands	Lower slopes/high river terraces	500	1 possible stone artefact (core)
9/Bundanon	Haunted Point to Musicians Cottage	13/1/2011	High for artefact scatters	Rough vehicle track, parallel to river, flat to gently undulating, some rainforest, lantana. Poor ground visibility	High river terraces,	1780	No sites
10/Bundanon	Musicians Cottage surrounds	13/1/2011	High for artefact scatters	Gently sloping to flat, cleared and grassed, some exposures around buildings and along track	Lower slopes	350	No sites
11/Eearie Park 1	Burrier Reach	26/11/2010	Sand shingles – low; Low terraces behind – medium/high for artefact scatters	Sandy shingles recent deposits being revegetated, river banks/terraces grassed, with weeds	River terraces and flats	450	No sites
12/Eearie Park 1	Eearie Park paddock	26/11/2010	High for artefact scatters/campsites above flood zone	Grassy paddocks below house, limited ground visibility	River terraces and flats	400	No sites
13/Eearie Park 1	Old Eearie Park ⁴ homestead site	13/1/2011	Medium for artefact scatters	Flat, gently sloping hummocky land, cleared and grassed, very little exposure	Lower slopes/high river terraces	350	No sites

⁴ Subsequently found not to be the site of the old homestead

14/Eearie Park 1	Eearie Park creek line and slopes	26/11/2010	Low for artefact scatters on sloping ground and flat poorly drained ground at bottom of valley, higher for more elevated areas e.g. lantana patch Medium for axe grooves in creeklines	Sloping, open forest, thick understorey in placers, narrow rocky southern and northern tributary creeklines, dry, with small rock ledges, covered in leaf litter and lantana in lower slopes/flats	Lower/mid-slopes and creeklines	670	1 set of axe grinding grooves 1 possible worked pebble
15/Eearie Park 1	Old logging road/fence line/track to river	13/1/2011	Medium for artefact scatters along logging road, low for slopes down to river Medium for axe grooves in adjacent creeks	Rough logging track under western escarpment – flat along top of low ridgeline, spotted gum with Casuarina understorey, transect turns eastward and drops steeply to escarpment above river, creek opens into river but lantana impenetrable. Creekline running across slopes, narrow and steep with rocky platforms	Midslopes/lower slopes, creeklines	600	No sites
16/Eearie Park 2	'Phasmid Lane' track and rock platform	26/11/2010	High for axe grooves on platform Low for artefact scatters along track Medium for rockshelters below escarpment	Open forest, tea tree understorey, flat, sandstone conglomerate platform, views over river	Plateau/escarpment edge		No sites
17/Eearie Park 2	Transmission line	3/12/2010	Medium for small artefact scatters	Cleared track under transmission line, low heath/open woodland, occasional sandstone platforms. Unsealed vehicle track west back	Plateau /upper slopes	720	No sites

				to Bundanon road			
18/Eearie Park 2	Bundanon Road Creekline	3/12/2010	High for artefact scatters along track High for axe grooves in creek valley	East from Bundanon road along a track with good visibility, gently sloping creek valley, Tall forest, rainforest in valley, small rocky areas and some ledges along creek bed	Upper slopes/creeklines	85	No sites
19/Eearie Park 2	Western escarpment access track	3/12/2010	Medium for artefact scatters	Open woodland, tea tree understorey, also casuarinas	Plateau/upper slopes	350	No sites Mound feature
20/Eearie Park 2	Western escarpment rocky platform	3/12/2010	High for axe grooves and stone arrangements on sandstone platform	Spectacular views to west over river, flat sandstone/conglomerate platform, with many depressions for holding water. Steep bluffs below, possible overhangs	Plateau/escarpment	480	No sites Historic beer bottle dump on old logging road
21/River	River transect	21/1/2011	High for artefact scatters Medium for burial sites High for rockshelters in steep bluffs next to river	Transect from Watersleigh to Burrier Crossing. Nine separate areas inspected, comprising river deposited sand forming terraces; areas where the base of the slope flattened out; sandstone bluffs, beach areas; intersections of creeks with the river	River flats and terraces	15.3 kms (spot checks = c. 2 kms)	No sites

6 Results

Despite intensive scrutiny, very little archaeological evidence was found. Sites recorded include two sets of axe grinding grooves; a possible pebble tool, a possible axe blank and a possible flaked stone artefact, possibly a core (see Table 3).

6.1 Site descriptions

Eearie Park axe grinding grooves 0268671E; 6137730N

Three axe grinding grooves, comprising two grooves together and one on its own. Length = 22 cm, width = 4.5 cms, average depth = 2 cms (same for all three grooves) (see Figure 11). This is likely to be the site recorded in 2003 by Jim Walliss and referred to by Trust staff.

The grooves are located just behind the lip of a 2 metre deep sandstone scarp in a steep, rocky and narrow creek valley, the western tributary of a small unnamed creek which does not connect to the Shoalhaven River.



Figure 11: Eearie Park axe grooves. Dark area is 2 grooves; pen is next to single groove

Table 3: Site gazetteer

Site type	Site ID	Survey precinct	Grid reference	Altitude (ASL)	Landform type	Description	Significance
Axe grinding groove (previously recorded by Jim Walliss)	Eearie Park 1	Eearie Park 1 Precinct	56H 0268671E; 6137730N	45m	Lower slopes and escarpments	3 small, indistinct grooves behind small scarp in ephemeral unnamed creek, c. 200 west of Shoalhaven River	Other better preserved axe grooves occur on properties. A common site type regionally. Location of grooves in a difficult to access narrow creek line may represent an activity other than sharpening axes.
Possible pebble tool	Eearie Park 2	Eearie Park 1 Precinct	56H 0268758E; 6137796N	61m	Lower slopes and lower escarpment	Elongated river pebble, on disused dirt track, in creekline. May be associated with axe grooves above.	Comprises an isolated manuport which may not be an artefact and is probably not <i>in situ</i> . Low scientific significance.
Axe grinding groove	Bundanon 1	Bundanon Precinct	56H 0271993E; 6136927N	92m	Escarpment and upper slopes	Single groove on prominent ridgeline, with river on three sides. No obvious water sources close by	May represent more than a groove produced by axe sharpening. Could be significant.
Possible axe blank	Bundanon 2	Bundanon Precinct	56H 0272437E; 6136769N	58m	Lower slopes and lower escarpments	Possible axe blank, northern side of prominent ridgeline.	Assessed as not being artefactual.
Possible core	Bundanon 3	Bundanon Precinct	56H 0273058E; 6136800N	27m	River flats and terraces	Probable multiplatform core, river terraces/lower slopes	Probably not in situ but of moderate scientific significance if definitely a core. Located in a zone of high potential, may be other artefacts present. Highly scientifically significant site if more artefacts are found.
Axe grinding grooves	Jim Wallis recording	Eearie Park 1	Approx. 0268900E; 6138700N		Upper slopes	Five reasonably defined grooves on sandstone shelf above a small depression.	Not assessed, but from photo, is a well preserved set of axe grooves, Scientifically significant.

Eearie Park worked pebble 0268758E; 6137796N

A single oval shaped river pebble, with possible pitting on the surface (see Figure 12). The rock is a hard, fine grained igneous rock type, not found in the immediate area. The possible artefact was found on a disused vehicle track where it crosses over the same creekline containing the axe grooves.



Figure 12: Possible worked pebble, Eearie Park

Bundanon axe grinding groove 0271993E; 6136927N

Single axe grinding groove (see Figure 13) in a small area of flat sandstone outcrop on a prominent north west to south east trending flat topped ridgeline that slopes down to the river at Haunted Point. Quite good visibility as little understorey except for grasses, open forest dominated by spotted gum. Lots of flat sandstone outcrops but mostly covered in moss and leaves.

Axe groove was aligned roughly north – south, with dimensions: length = 22 cms long; width = 4 cms at widest place, tapers at each end, very shallow, striations along one side. No other grooves were found in the vicinity despite careful searching. The ridgeline offers splendid views to the river on the northern side of the ridgeline and is a favourite place for artists to create their works (see Figure 14).



Figure 13: Bundanon axe groove



Figure 14: Northern view from axe groove location

Bundanon possible axe blank 0272437E; 6136769N

While traveling eastwards along a contour in steep rocky terrain just below ridgeline on its northern side (see Figure 15) a possible stone tool was observed sitting on top of a rock. It did not appear to be *in situ* and it was confirmed later that it had been placed there after being found by an ecologist during a vegetation survey of the properties.

The possible artefact has the features of a stone axe or hatchet in the early stages of its manufacture, with a number of large negative flake scars. It was made from a light grey, fine grained dense igneous rock (basalt or diorite) (see Figure 16). A careful search of the area found numerous small nodules of what appeared to be the same material. Photographs of

the possible axe blank were shown to stone tool expert Dr Richard Fullagar on 15/1/11, who thought it unlikely to be artefactual because of the absence of sharp angles or edges (Figure 10). The ground below the contour flattened out somewhat and had potential to contain campsites but was heavily infested with lantana and unable to be surveyed.



Figure 15: North-east view along contour, close to location of possible axe blank



Figure 16: Possible axe blank

Haunted Point possible core 0273058E; 6136800N

Haunted Point is a gently sloping toe slope/river terrace approximately 30 metres above the present river level. It is located on the inside of a very large bend in the river with river flats on all sides, on both sides of the river. There is a large bare area c. 40 metres x 15 metres, comprising gravels (possibly water deposited or the result of rock weathering), providing 100% archaeological visibility. The remainder of the area is rapidly being colonised by *Acacia* species and grasses, reducing archaeological visibility down slope towards the river (Figure 17).

The area has a very high potential for containing Aboriginal campsites, based on existing models of traditional Aboriginal occupation in riverine environments.

One possible core was located in the area of bare gravels, made from a grey igneous rock, possibly porphyry, with the appearance of flakes having been removed from all sides. There is small amount of pebble cortex still present. However, the absence of any other artefacts in the area throws some doubt as to whether this is an artefact (Figure 18).



Figure 17: Haunted Point, showing bare ground and colonising *Acacia*



Figure 18: Possible core, Haunted Point

7 Discussion

The field investigation resulted in the recording of two axe groove sites, an isolated artefact (multiplatform core) and a possible axe blank. Many more sites were anticipated, based on the predictive model established previously by Clarke and Kuskie (2006) and the proximity of the properties to the Shoalhaven River. The river would have not only been a major resource zone but also a transport corridor in traditional times.

Whilst only a small area was actually field surveyed and archaeological visibility was patchy, the low number of sites found is considered to be a true reflection of the archaeological footprint on the properties, as survey was as thorough as could be expected given limitations arising from impenetrable lantana. The apparent paucity of Indigenous archaeological sites on the properties defies a simple explanation. It is possible that camp sites containing artefact scatters on low river terraces have been washed away by repeated flooding over thousands of years or that land use practices have caused the destruction of sites. Evidence for rockshelter occupation was also expected, and although there are numerous rock shelters potentially suitable for occupation, most may have been too far above the river to be suitable for camping or rock art.

Another possible explanation is related to social organisation. The ethnography suggests that Indigenous people along the south coast people divided themselves into coastal and inland people (refer to section 10.2 of the Bundanon Trust Properties Indigenous Cultural Heritage Management Plan). It is possible that the location of the Bundanon Trust properties

close to the tidal limit of the Shoalhaven River meant that the area was used more as a transition or overlap area by both groups. Small mobile hunting or fishing groups from the coast and further inland may have visited the area for resource gathering as evidenced through early explorers' observations but may not have camped for extended periods of time.

The surveyed areas contain many landforms normally considered to have a high to very high probability for containing sites, and as such the results of this study challenge prevailing predictive models for archaeological evidence of Aboriginal occupation of the Lower Shoalhaven valley.

It is likely that unrecorded sites still exist on the Bundanon properties, awaiting future discovery, but it is very difficult to predict where they might occur. Based on a precautionary principle Appendix 3 is a predictive model for the properties, to guide planning for any future development. The presence of places and landscape of cultural significance to local Indigenous people cannot be predicted and must rely on consultation with relevant knowledge holders.

The axe grooves and possible axe blank are located in relatively remote locations and are not threatened by any proposed developments or natural processes. No archaeological sites were found in areas of potential future development e.g. 'western escarpment' and Haunted Point.

8 Recommendations

1. The recorded axe grooves (including those recorded previously by Jim Walliss) should be monitored on an annual basis to report on their condition and any potential threats to their integrity.
2. Any proposed developments in areas identified as having a high archaeological potential in the Indigenous Cultural Heritage Management Plan at Appendix 3, should be preceded by a heritage investigation by the Nowra Local Aboriginal Land Council and a professional archaeologist (if relevant).
3. The environmental assessment for any development at Haunted Point should include an archaeological survey and should confirm the artefactual nature of the stone core. The survey should be conducted after ground vegetation has been cleared, to increase archaeological visibility.

4. Any ground disturbing maintenance works or operations e.g. digging drains, building new roads, etc, occurring within zones of high archaeological potential should be preceded by an Indigenous heritage assessment
5. All Aboriginal objects are legally protected in NSW and a permit is required to legally impact an object. It is an offence to impact an object without a permit, unless the Due Diligence process has been followed (see Appendix 5). It is recommended that the Trust confirm with OEH that the preparation of the Indigenous Cultural Heritage Plan and the associated archaeological survey is a legal defense under the 2010 amendments to the *National Parks and Wildlife Act 1974* if objects are harmed as a result of development.

9 References

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