

SHORT REPORTS

The Temporality of Cultural Material on a Deflated Dune System at Abbot Point, Central Queensland Coast

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Introduction

Abbot Point on the central Queensland coast has long been recognised as an area of cultural heritage significance (Environmental Protection Agency 1999). The area has essentially been ignored in terms of research archaeology because of the lack of integrity of the cultural material, nearly all of which sits on deflated dune surfaces. Because of the problems associated with preservation of open sites in coastal tropical environments (see Bird 1992) most archaeological reconstructions in the region have been based on rockshelter deposits. However, the sheer volume and density of archaeological material found along the coast in this region indicate that open coastal sites such as Abbot Point and Upstart Bay to the north were probably intensively used with evidence of a much greater range of generalised hunter-gatherer activity in comparison to the more specialised rockshelter sites (Barker 2004; Bird 1992; Brayshaw 1990). Thus, given the evidence of intensive use of Abbot Point and its central location within a system of other clearly linked sites within the region (see below), it was felt that an attempt should be made to include this site within the wider framework of regional site patterning and use and that in this context an attempt should be made to establish its temporality.

This study was carried out as part of a consultancy on behalf of Ports Corporation of Queensland and the Giru Dala Council of Elders, Bowen, with the aim of locating, recording and assessing the cultural heritage significance of prehistoric and historic sites within the boundaries of Ports Corporation of Queensland land holdings at Abbot Point and the Bowen region (Barker 1999) (Figure 1).

Environment and Geomorphology

Abbot Point is located 20km north of Bowen and is the site of a large coal loading facility at the extreme northern end of Abbot Beach (Figure 1). Abbot Beach is formed by an extensive beach dune system which extends south for 6km from Abbot Point in the north to an extensive mangrove system at Euri Creek in the south. The Caley Valley wetland surrounds Abbot Point to the south and west (Ports Corporation of Queensland 2005).

The dune system extending the length of Abbot Beach consists of quartzose sands closely associated with estuarine/river sedimentary outflow and sand moved onshore from the continental shelf during the Holocene marine transgression. The foredunes are mobile, early to mid-Holocene in origin, associated with transgressive events leading up to mid-Holocene sea-level stabilisation (Hopley 1970). A feature of the beach is the presence of an offshore rock platform extending parallel to the beach for approximately 3.5km, forming a seaward buffer to

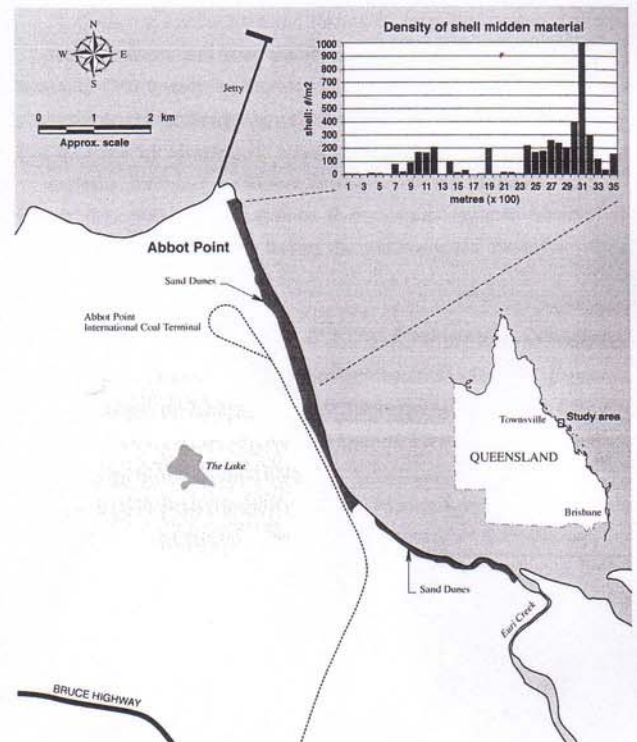


Figure 1 Abbot Point. Density of shell midden material calculated every 100m (after Ports Corporation of Queensland 2005).

foredune exposure. This rock platform is exposed at low tide. An extensive range of archaeological cultural material is present on the foredune area. All of the cultural material visible today sits on deflated dune surfaces.

The Archaeology

The cultural material at Abbot Point is spatially extensive with discrete and often dense concentrations of midden material located within an almost continuous 'background' scatter of lower density shell and in this context it resembles other closely related coastal dune sites such as Upstart Bay to the north (Bird 1992; Campbell 1982).

Midden material is present more or less continuously for 3.5km down the beach at varying densities ranging from a low of 9.1 fragments of shell/m² at the very northern end of the beach to 1000 fragments of shell/m² near the southern extent of the scatter (Figure 1). Although shell was used as an indicator of presence and density, it is acknowledged that dune deflation artificially magnifies densities; however, a complex and extensive array of other archaeological material is present which clearly differentiates this site from others along the coast. Thus, it is clear from the diverse range of archaeological evidence that Abbot Beach is an important site which saw intensive occupation.

This evidence includes a range of stone artefact 'types' including grindstones, hammer stones, backed blades and implements such as 'Juan Knives' and 'Elouras', edge-ground axes and other flaking debris (Figure 2). Raw materials range from local basalts and granite (Mount Roundback) to exotic cherts, quartzite and volcanic tuff from as far away as South Molle Island 120km to the south (see Barker and Schon 1994). Shell artefacts, such as *Gelonia coaxans* (mud mussel) scrapers and *Melo amphora* (Baler shell) water carriers are also present. Subsistence remains include a range of mangrove and sandy beach bivalves and gastropods, including the mud-dwelling mangrove bivalves *Gelonia coaxans* (mud mussel), *Trichomya hirsuta* (hairy mussel), oysters and *Anadara aliena* (mud ark) and the gastropods *Telescopium telescopium* (mud creeper) and *Pyrazus ebeninus* (mud whelk). Sandy rubble-dwelling bivalves include a range of *Veneridae* sp. Overall, the shell assemblage is dominated by a Muricidadae species, the rocky reef-dwelling thaid, *Thais luteostoma*. Other evidence of subsistence activity includes burnt turtle bone, bird bone and 'hearth stone' manuports.

It is clear from the evidence of flaked bottle glass that Aboriginal occupation of the Abbot Point foreshore and wetlands continued into the historical period.

Radiocarbon Dating

The basic rationale behind dating of non-stratified deposits at Abbot Point was to obtain a large sample of dates on cultural material in order to at least provide a maximum and a minimum age of site use. Although it can never be unequivocally proven that the dates obtained are the oldest, contextual factors, such as a close correlation with the known maximum age of cultural occupation for the region as well as with the temporal profile of site types such as coastal middens, can all provide corroborating evidence.

The other key issue in the dating of non-stratified sites relates to ensuring that the material chosen is of cultural origins. Selection of shell for dating, therefore, was wherever possible carried out on mangrove species which have been culturally transported some 2km northward from the extensive mangrove forests to the beach. Other factors supporting cultural origins of dated samples include the marked differences between humanly selected shell species and individuals and those deposited through natural processes. Naturally deposited shell from such action as storm/cyclonic events tends to be extremely heterogeneous in terms of species present, including species known to be 'non-economic', covers the whole range of sizes within a population



Figure 2 Deflated midden material and grindstone (scale=30cm) (Photograph: Bryce Barker).

and tends to be highly fragmented. Cultural deposits of shell on the other hand tend to be restricted in type (i.e. only preferred edible species), narrow in size range and largely intact or at least not as fragmented. At Abbot Point only three species of shellfish from the sand/rocky reef adjacent to the dune system are present from a potential shellfish population of dozens of species; they all fall within a similar size range and are largely intact. Although the range of mangrove species present is fairly broad, only two species were represented consistently across the site (*Melo amphora* and *Gelonia coaxans*). Furthermore these same species are found in middens that are stratified within the wider region and some at Abbot Point are burnt or artefactual.

It is acknowledged that a direct cultural association with a single individual shell from the sandy/rocky reef system adjacent to the dune system can be strongly implied but not unequivocally stated. However, it is argued that the presence of mud-dwelling bivalve and gastropod species from mangrove systems 2km southward on the dune system in clear association with a wide range of other cultural material and fitting a cultural pattern of shellfish predation known for the region provides strong support for a cultural origin.

Shell samples were collected approximately every 100m where shell was densest along the dune system extending southward for approximately 3.5km. Nine samples of shell were submitted for AMS dating to ANSTO (Table 1).

Calibrations were conducted using the CALIB (v5.0.1) computer program (Stuiver and Reimer 1993). Dates on marine samples were calibrated using the marine calibration model dataset of Hughen *et al.* (2004). Although a range of marine reservoir corrections have recently been obtained specifically for

Table 1 Radiocarbon determinations from Abbot Point.

Location (see Figure 1)	Sample ID	Lab. No.	Species Dated	¹⁴ C Age (years BP)	Calibrated Age BP (2 sigma range)
300m	Sample 1	OZE880	<i>Thais luteostoma</i>	470±30	0*-223
700m	Sample 4	OZE881	<i>Thais luteostoma</i>	375±40	modern
1200m	Sample 5	OZE882	<i>Melo amphora</i>	310±35	modern
1600m	Sample 6	OZE883	<i>Thais luteostoma</i>	575±35	74-287
1900m	Sample 7	OZE884	<i>Gelonia coaxans</i>	555±35	0*-274
2400m	Sample 8	OZE885	<i>Gelonia coaxans</i>	490±35	0*-228
2700m	Sample 9	OZE886	<i>Gelonia coaxans</i>	360±35	modern
3100m	Sample 10	OZE887	<i>Thais luteostoma</i>	730±30	286-442
3500m	Sample 11	OZE888	<i>Gelonia coaxans</i>	505±30	0*-229

the central Queensland coast to the south of the study region (Ulm 2002), highlighting regional variation in the marine reservoir effect along the coast, the generalised regional average of $\Delta R=11\pm 15$ (Reimer and Reimer 2006) was used to calibrate dates (Stuiver and Reimer 1993). Samples too young for use of the calibration curves are reported as 'modern'. Ranges marked with a '0*' are suspect owing to impingement on the end of the calibration dataset (Stuiver *et al.* 2005).

As shown in Table 1, only two dates fell outside the range of modern, Sample 6 (OZE883) with a calibrated age-range of 74–287 cal BP and Sample 10 (OZE887), encompassing a temporal range of 286–442 cal BP. The range of dates obtained post-date the establishment of the dune system and closely mirror the very late Holocene range of the earliest dates from stratified coastal middens between Cape Cleveland and Bowen as well as another obtained in a stratified deposit at Abbot Point by Hopley (1970). By using a relatively large sample of dates spanning a representative sample spatially across the whole site, I have been able to reasonably show that these dates are a true reflection of the archaeological signature (Bird 1992; Campbell 1982; Hopley 1970). Whether this late Holocene temporal profile dating to the last 500–600 years is solely a product of cyclonic events as suggested by Bird (1992) and Rowland (1989) or a reflection of socio-cultural factors relating to post-500 BP changes to tropical Aboriginal coastal peoples on the east coast (Barker 2004) remains to be resolved.

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