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## The study region: the southern Curtis Coast

### Introduction

This chapter contextualises the study with brief outlines of the physical environment, Aboriginal cultural setting and previous archaeological investigations in the region. The first section covers geology, climate, hydrology, flora, fauna and palaeoenvironment to provide a background to regional landscape development, resource availability and dating issues. Local ethnographies, documentary histories and oral histories are reviewed in the second section to create an overview of recent Aboriginal lifeways and historical transformations in the region. The final section summarises previous archaeological work in the broader region before focussing specifically on the results of Gooreng Gooreng Cultural Heritage Project investigations on the southern Curtis Coast. Information from dated but as yet unexcavated sites is also presented.

### Physical setting

For the purposes of this study, the southern Curtis Coast is defined as the coastal landscapes between the mouth of Baffle Creek and Rodds Bay. This area is also commonly known as the 'Discovery Coast'. It is located in southeast Queensland, just south of the Tropic of Capricorn. The study area extends along the coast from Wreck Rock in the south to Hummock Hill Island in the north and inland to Miriam Vale and Bororen in the west (Figs 2.1–2.2). This region covers a total land area of about 1,500km<sup>2</sup>, with a high water shoreline length of over 500km. The boundaries of the study region are located 70km northwest of Bundaberg and 20km southeast of Gladstone, between latitudes 24°20' and 23°58' south and longitudes 151°26' and 152°00' east.

The study area falls within the northern end of the well-defined southeast Queensland bioregion and exhibits two major landscape provinces — the Burnett-Curtis Coastal Lowlands in

the southeast and the Burnett-Curtis Hills and Ranges in the north and west (Sattler 1999; see also Coaldrake 1961). The former are characterised by fine-grained sediments; alluvium; coastal and estuarine sediments; a broad coastal plain; high rainfall (1,100mm); low elevation (<50m); and eucalypt and melaleuca forests and woodlands. The latter are characterised by acid volcanics; metamorphics; localised basic volcanics; small areas of elevated sediments; hills and ranges; alluvial valleys; high rainfall (900mm); medium elevation (<250m); and eucalypt woodlands and araucarian microphyll rainforest (Young and Dillewaard 1999).

The coast is characterised by extensive estuaries and embayments bordered by saltflats and claypans. Recent (<6,000 year old) Holocene sediments dominate the geology of the area with beach ridges up to 2km wide bordering Bustard Bay. The Baffle Creek catchment dominates the western two-thirds of the study area, although its outlet to the ocean is located 24km south-southeast along the coast from Wreck Rock at the southern-most point of the present study region. The region is characterised by broad curved sandy beaches anchored to rocky headlands backed by high dunes in the south and extensive tidal estuaries and freshwater wetlands in the north (Figs 2.3–2.4). Further inland, the near-coastal granite ranges contribute to a complex drainage system which maintains freshwater coastal swamps and wetlands that flow both north into Rodds Harbour and south into Baffle Creek.

### **Geology and geomorphology**

The southern Curtis Coast comprises a relatively restricted range of rock types and landforms dating from 235–213 million years ago to the last 6,000 years (QDEH 1994:33). The basal geology of all but the extreme west of the study area is dominated by rhyolites and granites assigned to the Agnes Water Volcanics formation of the Toogoolawah Group (Ellis and Whitaker 1976; Stevens 1968). The Agnes Water Volcanics drape an uneven underlying land surface composed of heavily weathered and undifferentiated granites of Permian to Triassic age and adjacent Palaeozoic sediments (Ellis and Whitaker 1976). The thickest accumulations of the formation fill palaeotopographic lows that now persist as headlands along the contemporary coastline (Stephen Cotter, Cooperative Research Centre for Landscape Evolution and Mineral Exploration, University of Canberra, pers. comm., 2001; see also Ulm et al. 2005).

Although the coast is punctuated by rocky headlands, the study area is characterised as a depositional coastline with low north-northwest trending Holocene beach ridges and swales oriented roughly parallel to the modern coastline, trailing northwards from the northern side of almost every estuary of note (Hopley 1985:76–7). Beach ridges and sand masses consist of fine-grained quartz sands and dispersed heavy mineral sands including rutile, ilmenite and zircon (Connah 1961). The coast in the study area is open to full oceanic conditions, which has significantly impacted on coastal sedimentation and erosion regimes. This situation is relatively unusual on the Queensland coast, as to the south the mainland is protected by the marine sand accumulations of Fraser, Moreton, and North and South Stradbroke Islands and Cooloola, and to the north by the Great Barrier Reef.

One of the primary issues in evaluating the regional archaeological record is consideration of palaeoenvironmental factors, particularly the potential effects of sea-level change and erosion on site survival and visibility. Accumulating geomorphological evidence suggests that there may have been minor variations in sea-level along the eastern Australian coast since 6,000 BP. Larcombe et al. (1995) have recently presented a model of episodic post-glacial sea-level rise based on a detailed study of radiocarbon dates from the central Great Barrier Reef shelf (between Hayman Island and Cape Tribulation) for the last c.12,000 years. On this basis, they identify a peak in sea-level at c.8,500 BP at c.–11m, a regression at c.8,200 BP at –17m, followed by a rapid rise to c.–5m at c.7,800 BP.



In the absence of sea-floor studies in the study region, local bathymetric contours are employed to approximate the general position of palaeoshorelines. This approach is particularly problematic on sandy coastlines with broad, low gradient continental shelves owing to sediment accumulation on the sea-floor. Despite these uncertainties, this approach can provide a general impression of the approximate positions of palaeoshorelines relative to the modern coastline (see Barker 1995; McNiven et al. 2002). The -200m bathymetric contour, located 75–95km northeast of the current coastline, provides an approximation for the position of the shoreline at the Last Glacial Maximum c.18,000 BP (Fig. 2.1). The study area is located just south of the point where the continental shelf broadens to some 250km wide. Over 200km<sup>2</sup> of continental shelf immediately adjacent to the study region has therefore been inundated over the last 12,000 years, since sea-levels breached the steep continental slope and began to inundate the continental shelf. In the early Holocene the coast would have been within 1.5km of the current shoreline throughout most of the study area although, for reasons outlined below, it is unclear how these changes impacted on the form and development of estuaries. Taken together, this evidence suggests a geologically very recent origin for many of the coastal landforms which are the subject of this study, including numerous tidal estuaries, extensive intertidal and subtidal flats, low sandy beach ridges and cheniers (see below).

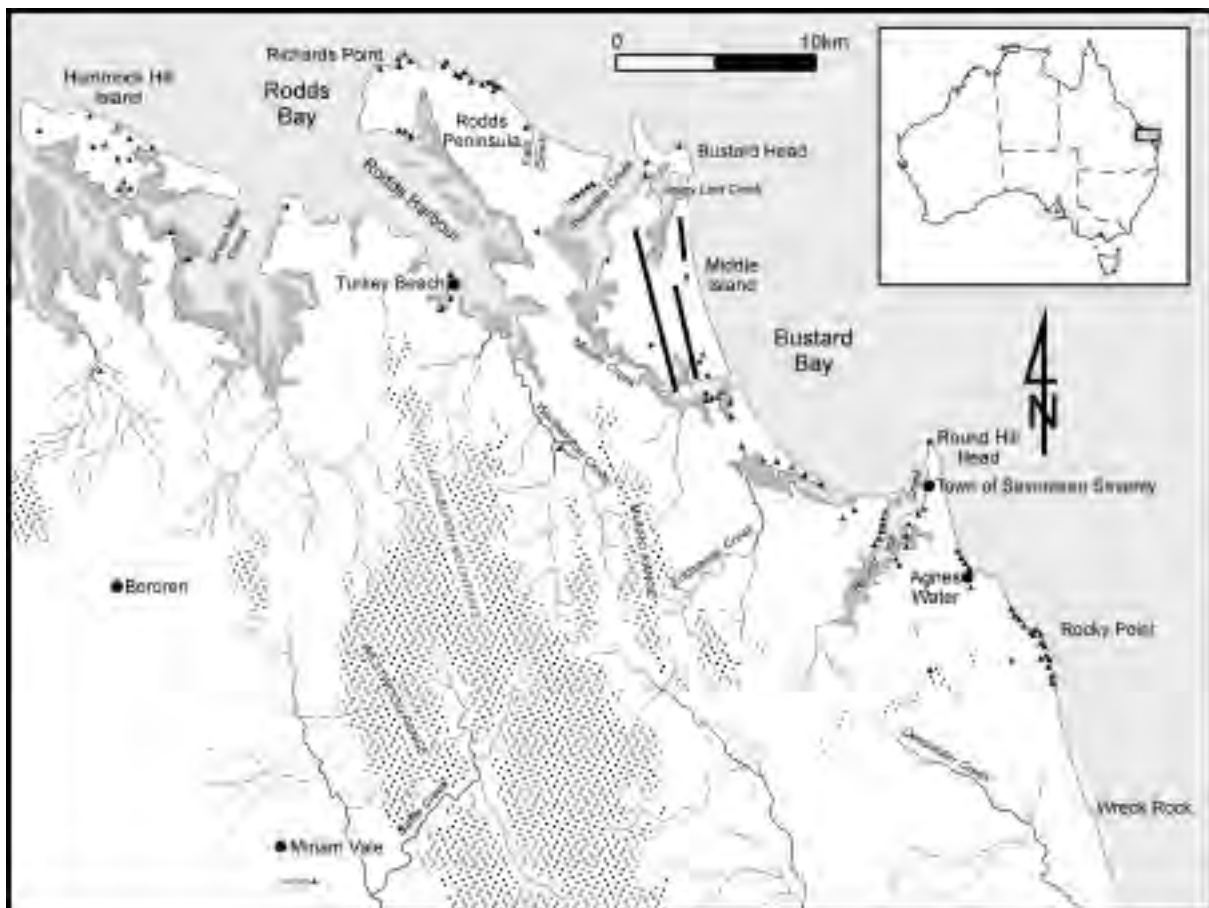


Figure 2.2 The southern Curtis Coast study area, showing all recorded archaeological sites as triangles (after Ulm and Lilley 1999). Site designations are shown for sites which are not illustrated in Figs 2.9–2.11. Heavy black lines on Middle Island indicate the general location of extensive low density shell deposits.

## Climate

The Curtis Coast has a subtropical maritime climate characterised by dry mild winters and hot humid summers influenced by the southeast trade winds, topography and the moderating influences of the ocean. The region experiences occasional monsoon influences, although cyclones are more frequent features, as are the major frontal systems common in more southerly latitudes. These varied influences generate marked variability in rainfall, temperature and prevailing wind conditions (QDEH 1994:11). Average minimum and maximum temperatures range from 22.8°C and 28.9°C respectively in the summer to 13.4°C and 20.9°C respectively in the winter (QDEH 1994:13). Rainfall is summer-dominated, with January and February commonly the wettest months and August and September the driest, with mean annual rainfall at the Town of Seventeen Seventy of 1,318mm (QDEH 1994:11). Major factors which influence the distribution of rainfall include topographic influences of mountain ranges, geographic influences such as the orientation of the coastline to the prevailing water-saturated winds, and occasional cyclones causing extreme rain events from November to April.

## Hydrology

The southern Curtis Coast is transected by numerous creeks and rivers which form an extensive network of interconnected estuaries. Numerous minor seasonal tributaries drain into estuarine creeks from the low subcoastal ranges in the west. The Munro Range, Edinburgh Mountains and Westwood Range divide the catchments of Baffle, Round Hill, Eurimbula and Middle Creeks to the south and east from Worthington and Seven Mile Creeks to the north (Olsen 1980a:4; see Fig. 2.2). The major influences on water movement within these tributaries are prevailing tides and weather conditions, although freshwater inflow associated with periods of high intensity rainfall can cause heavy runoff. In the south, Round Hill, Eurimbula, Middle, Jenny Lind and Pancake Creeks are generally shallow, mangrove-fringed estuaries characterised by sandy bottoms merging to silt and clay in the upper reaches (Olsen 1980a:3). To the north, Rodds Harbour and Seven Mile Creek exhibit deeper channels near the mouth and extensive flats and zones of silty sand upstream with large areas of mangroves with claypans bordering grassy or layered eucalypt forest (Olsen 1980a:3; see Table 2.1).

Tidal processes of the southern Curtis Coast are influenced by the presence of the southern extremities of the Great Barrier Reef, ocean floor topography and coastal geology, such as inshore islands and headlands (QDEH 1994:17). The tidal effects of estuaries also contribute to the amplification of tidal range, with an average maximum tidal range of 2.43m at Pancake Creek in the approximate centre of the study region (QDOT 1998). Like all coastal regions, the area is subject to both wind- and storm-generated waves which modify the configuration of the shoreline. Unfortunately, only scant research into coastal erosion processes has been undertaken in the area and the effects of erosion on the representation of archaeological materials in open beach contexts is difficult to assess. Anecdotal evidence and field observations suggest that storm-surge activity exacerbates local erosion (Fig. 2.5).

Table 2.1 Creek/estuary characteristics in the study region (Olsen 1980a:17-25).

CREEK	ESTUARY (km <sup>2</sup> )	MANGROVE (km <sup>2</sup> )	SAMPHIRE/ CLAYPAN (km <sup>2</sup> )	SHORELINE LENGTH (km)	WATER AREA (km <sup>2</sup> )
Round Hill	14.06	4.66	3.21	38.8	6.08
Eurimbula	6.8	2.98	1.06	22.2	1.76
Middle	17.41	5.64	4.61	53.8	7.15
Jenny Lind	6.96	2.5	1.58	40.8	2.88
Pancake	25.6	8.21	4.78	59	12.61
Rodds Harbour	72.54	17.32	6.34	97.5	48.88
Seven Mile	55.57	14.39	9.88	82.5	31.2
Total	198.94	55.7	31.46	394.6	110.56

## Flora

The ecological complexity and diversity of the study region reflect its status as part of a transitional zone between tropical and temperate provinces, with a zoogeographical boundary identified at about latitude 25° south (Edean et al. 1956; Knox 1963). This overlap generally translates into high rates of floral and faunal diversity, with representation of both tropical and temperate species. The region supports an extensive range of herblands, grasslands, heaths, scrubs and tall shrublands, and open and closed forests (QDEH 1994:45). Mixed herblands on foredunes include goat's foot convolvulus (*Ipomoea pes-caprae*) and coastal jack bean (*Canavalia rosea*). Extensive wet and dry heathlands occur on poorly-drained sandy-loam soils, comprising a number of species generally less than 2m in height, including banksia (*Banksia* sp.), teatree (*Melaleuca* sp.), and grass trees (*Xanthorrhoea* sp.). Beach ridges support tall, open paperbark forests, dominated by teatrees (*M. leucadendra* and *M. dealbata*) in association with weeping cabbage palm communities (*Livistona australis*) and bracken fern (*Pteridium esculentum*) (Fig. 2.6) (QDEH 1994:48). The distribution of closed forest is limited, with a relatively restricted tall, closed-forest community found bordering Eurimbula Creek, with hoop pine (*Araucaria cunninghamii*) emergent above a notophyll vine forest (QDEH 1994:49). Estuaries exhibit extensive fringing vegetation communities consisting of combinations of some 13 mangrove species dominated by the grey mangrove (*Avicennia marina*), spotted mangrove (*Rhizophora stylosa*) and yellow mangrove (*Ceriops tagal*) (Dowling 1980; Olsen 1980a). Seagrass beds (dominated by *Zostera capricornia*) are typically found in sheltered waters where water clarity allows sufficient light penetration for photosynthesis, including Round Hill Creek, Rodds Harbour, Pancake Creek and Mort Creek (Olsen 1980b; QDEH 1994) (Fig. 2.7). These estuarine habitats provide important habitats for fish, shellfish and crustaceans as well as turtles, dugongs and water fowl. Important local plant resources include cycads (*Cycas megacarpa*), bracken fern, grass tree (*Xanthorrhoea* sp.), bungwall fern (*Blechnum indicum*), weeping cabbage palm and pandanus (*Pandanus* sp.). Some of these resources are associated with often complex specialised processing technologies.

## Fauna

The region's terrestrial fauna is diverse and includes seven species of amphibians (all frogs and toads), 60 species of mammals (including bats, echidnas, koalas and kangaroos), 59 species of reptiles (including lizards and snakes) and 288 bird species (including shorebirds, waterbirds, seabirds and birds of prey) (QDEH 1994:59–65). Common macropods include the eastern grey kangaroo (*Macropus giganteus*), whiptail wallaby (*M. parryi*), swamp wallaby (*Wallabia bicolor*) and rufous bettong (*Aepyprymnus rufescens*). Other commonly recorded mammals include the Gould's long-eared bat (*Nyctophilus gouldii*), short-beaked echidna (*Tachyglossus aculeatus*), common ringtail possum (*Pseudocheirus peregrinus*) and yellow-footed marsupial mouse (*Antechinus flavipes*) (Woodall 1991). Occasional dingoes (*Canis lupus dingo*) have also been sighted in remote parts of the study region. Emus (*Dromaius novaehollandiae*) and the Australian brush-turkey (*Alectura lathamii*) are locally common terrestrial birds. Other common bird species include the abundant Pacific black duck (*Anas superciliosa*), common noddy (*Anous stolidus*), beach thick-knee curlew (*Esacus magnirostris*) and eastern curlew (*Numenius madagascariensis*). The terrestrial environment has been impacted by localised intensive logging and long-term cattle grazing. At least one local extinction is apparent, that of the eastern bustard or plain turkey (*Choriotis australis*) (Growcott and Taylor 1996:25).

Common marine fauna found along the Curtis Coast include a number of whale species (including the humpback *Megaptera novaeangliae*), four species of dolphins (including the common bottle-nose *Tursiops truncatus*), dugongs (*Dugong dugon*) and turtles (including loggerhead *Caretta caretta* and green *Chelonia mydas*). Rodds Harbour supports the largest dugong population along the Curtis Coast (QDEH 1994:66). As a transition zone, the area is also a wintering destination for some whales and migratory waterbirds.

A total of 148 species of fishes from 69 families is recorded for the Curtis Coast (QDEH 1994:68). Useful data are provided by Lupton and Heidenreich's (1996) detailed study of Baffle Creek just to the south of the study area. The lower estuarine component of this fisheries resource assessment covered habitats similar to the coastal estuaries in the study area. Despite significantly depressed regional rainfall levels (25% under the annual average) before and during the survey period, 55 fish and nine crustaceans were recorded. The larger fish species were (in order of abundance) flat-tail mullet (*Liza dussumieri*), sand mullet (*Myxus elongatus*), whiting (*Sillago ciliata*, *S. maculata* and *S. sihama*), yellowfin bream (*Acanthopagrus australis*), blue-tail mullet (*Valamugil seheli*), sea mullet (*Mugil cephalus*) and garfish (including *Arrhamphus sclerolepis* and *Hyporhamphus ardelio*) (Grant 1993; Lupton and Heidenreich 1996). Commercial finfish catches for the region reflect this pattern, with mullet, whiting and bream accounting for 64.1% of commercial catches (Olsen 1980a:11). Early historic accounts suggest that fish may have been more abundant in the past with both Banks and Parkinson impressed by the quantities of fish in the bay and estuary (Banks in Beaglehole 1963; Parkinson 1773). Mud crabs (*Scylla serrata*) and sand crabs (*Portunus pelagicus*) are also common.

Bivalves are common local marine mollusc fauna, attributed by Woodall et al. (1991, 1993) to the prevalence of sandy and muddy substrates and the paucity of rocky platforms. Unfortunately, the only marine mollusc studies available are based on observations of dead beach-washed specimens recovered from exposed beaches. Such inventories can only be taken as a general guide to living mollusc populations in the region. The contemporary estuarine mollusc fauna along the southern Curtis Coast is dominated by rock oyster (*Saccostrea glomerata*), found in mangrove and rocky habitats, and gastropods such as the hercules club shell (*Pyrazus ebeninus*), and members of the family Potamididae, including the mud creepers *Telescopium telescopium* (Fig. 2.8) and *Terebralia sulcata* (Roughley 1928; Shanco and Timmins 1975). Midden deposits are



Figure 2.3 General view of estuary and near-coastal ranges across Jenny Lind Creek. Such estuaries are common in the region and support diverse populations of marine life. Facing southwest.



Figure 2.4 Freshwater wetlands adjoining the upper reaches of Round Hill Creek. This swamp is part of a vast network of interconnected wetland areas located in the swales between ridge systems. Facing north.



Figure 2.5 Example of recent bank recession of the north bank of Middle Creek, showing concrete stairs once used to access the beach from the top of the erosion bank some 15m away from the contemporary section. Facing northwest.



Figure 2.6 Beach ridge vegetation in Eurimbula National Park, including weeping cabbage palm communities (*L. australis*) and bracken (*P. esculentum*).



Figure 2.7 Mud ark (*A. trapezia*) in a dense paddock of seagrass (*Z. capricornia*) in the middle of Round Hill Creek. The presence of mud ark valves in sites dated to 4,000 BP indicate that seagrass beds are a long-term feature of the local environment. Facing west.



Figure 2.8 Cluster of telescope mud whelk (*T. telescopium*) on the mangrove fringe of Eurimbula Creek. These whelks are abundant throughout the region, although virtually absent from archaeological deposits. Facing west.

dominated by rock oyster (*S. glomerata*) and the mud ark (*Anadara trapezia*) (Fig. 2.7), an estuarine bivalve. This last species is uncommon in the study area today and generally sparse in the coastal waters of Queensland (Chappell and Grindrod 1984:222) and is not included in estuarine inventories for the region (Shanco and Timmins 1975). Contemporary open coast mollusc populations are relatively depauperate, with scattered populations of milky oyster (*S. amassa*) on exposed rocky headlands (Olsen 1980a:11, 13) and pipi (*Donax deltoides*) on stretches of high energy sandy coast. Freshwater bivalves have been collected from both Eurimbula Creek and Deepwater Creek and include *Alathyria pertexta* and *Velesunio ambiguus* (Woodall et al. 1991, 1993).

### Palaeoenvironment and environmental change

Shoreline progradation, erosion and sea-level change are the major factors responsible for coastal landscape changes in the region since the early Holocene. Minor changes in sea-level can have a dramatic impact on the configuration of low gradient coastlines such as those of southeast Queensland. None of the estuaries in the study area has a significant or permanent freshwater outflow and therefore none is likely to have an incised channel, suggesting that local estuary formation is related to the final stages of sea-level rise. Episodes of mid-to-late Holocene dune-building towards the seaward margins are evidenced in the alignment of transgressive dune systems parallel to the modern shoreline. Of particular interest is the fact that the overall sedimentation regime in place since the mid-Holocene is positive, like elsewhere in southeast Queensland, with prograding rather than receding landforms the dominant landscape features (see Cotter 1996). Contemporary patterns of erosion appear to be relatively recent, impacting primarily on the exposed coastline and estuary mouths. The absence of archaeological materials on transgressive dunes bordering the coastline supports the notion that the coast was still actively prograding until the last few hundred years. As Lourandos (1997:225) noted for southwestern Victoria, the regional

coastal landscape is a prograding or depositional form and therefore recent sites are, in fact, more susceptible to erosion than older deposits (i.e. more recent archaeological deposits are in closer proximity to the modern shoreline than older ones). Periods of chenier formation also changed landscapes in specific areas since the mid-Holocene. Radiocarbon analyses of chenier deposits at Mort Creek suggest several episodes of formation, the earliest ceasing around 3,300–3,100 BP and a later episode occurring between 2,400 and 2,100 BP (Chapter 7). These dates broadly coincide with major periods of chenier formation identified at 3,550 BP and 2,500 BP at Broad Sound, 250km to the north, where they are linked to phases of decreased sediment supply (Cook and Polach 1973).

As part of the Gooreng Gooreng Cultural Heritage Project, a large suite of cores was taken from swamp deposits, archaeological sites and deposits adjacent to archaeological sites in an attempt to integrate local environmental and archaeological records. The most significant cores have been obtained from a permanently water-logged area of the Deepwater Creek drainage basin at the northern end of the Deepwater Section of Eurimbula National Park. Several cores up to 6m in length and dating up to 13,150±120 BP (OZD-757) were obtained from this deposit. It is anticipated that analysis of these cores will provide a detailed long-term vegetation history of the region. Preliminary study of another core dated to 3,240±60 BP (OZD-755) establishes the presence of mangrove pollen in present swamp areas draining into Round Hill Creek. Unfortunately, detailed analysis of these cores, which would provide an independent model of local palaeo-environmental and sedimentary development, remained unavailable at the time of writing (Maria Cotter, School of Human and Environmental Studies, University of New England, pers. comm., 2003). A limited coring program has demonstrated that the low sand ridges abutting the rhyolitic core of the peninsula formed on the northern bank of the confluence of Tom's Creek and Round Hill Creek and adjacent sand ridge residuals on the intertidal flats to the west are underlain by bluish-grey muds (associated with a date of 1956±57 BP (NZA-13385)), suggesting deposition in an estuarine environment (Chapter 13). Preliminary examination indicates that these sediments are rich in organic material and dominated by mangrove pollen and are therefore interpreted as mangrove facies.

In the absence of further data in the immediate region, the closest palaeoenvironmental studies available come from Fraser Island to the south and the Whitsunday Islands to the north. Longmore (1997a, 1997b; Longmore and Heijnis 1999) found a record of a mid-Holocene dry period in perched lakes on Fraser Island and of a major shift in vegetation after the Last Glacial Maximum from Araucariaceae to Casuarinaceae. A more detailed Holocene palaeoenvironmental record is available from Whitehaven Swamp on Whitsunday Island (Genever et al. 2003). Analysis of a 5.77m deep core dated to 6,957±58 BP (Wk-9389) at 5m suggests relative environmental stability since the mid-Holocene, with an emphasis on open and coastal woodland communities, and a reduction in rainforest over the last few thousand years. In contrast to the Fraser Island data, the distribution of rainforest taxa are associated with a moister mid-Holocene climate.

Shell midden composition can also be a useful broad palaeoenvironmental indicator on the assumption that midden contents will generally reflect local resource availability. It should be noted that shellfish communities oscillate in response to a wide range of often very localised conditions such as changes in substrate, temperature and salinity as well as predation pressure (Claassen 1998). Although middens in the region contain large quantities of mud ark (*A. trapezia*), estuary surveys revealed very low extant populations, suggesting that *A. trapezia* was more abundant in the past. Researchers in northern and northwestern Australia frequently cite the closely related *A. granosa* as 'not found in the mangrove-lined coast' (Hiscock 1997:445) and preferring 'the silty-sandy substrates of open beaches' (Hiscock 1997:447 citing Broom 1985). Although few studies have been conducted on *A. trapezia* ecology, it is known to be very similar to *A. granosa*, with the possible exception of a frequent (perhaps symbiotic) association with seagrass, which requires shallow water with relatively low turbidity (Inglis 1992). Shell assemblages dating

to the last 2,000 years show a consistent decline in *A. trapezia* abundance with a concomitant increase in the representation of oyster. The presence of *A. trapezia* in local assemblages by 4,000 BP suggests that estuarine conditions were already established in the region by this time, but that conditions less favourable to this taxa have prevailed in the recent past.

Oyster (*S. glomerata*) representation also sheds light on past environmental conditions in the area. Oysters require a hard substrate for attachment and occur on sheltered rocky shores and mangroves in the mid-intertidal zone. In the absence of rocky shores in most sheltered estuaries in the region, oysters often attach to the aerial prop roots of mangroves. At the Seven Mile Creek Mound, the high proportion of non-artefactual stone in the deposit and the presence of oyster bases still attached to gravels suggest that oysters were collected from the extensive shell/rock debris on the intertidal flats adjacent to the site (Chapter 6). However, such debris beds do not occur at other major estuaries in the region, indicating that oysters may have been primarily collected from mangrove substrates. Examination of oyster bases from sites such as Eurimbula Site 1 (Chapter 12) show a high proportion of valves exhibiting distinct concavities suggesting a growth position around a cylindrical substrate. The presence of oyster bases with these features may therefore be used as a proxy for the presence of mangrove communities near to the site in question. The increasing representation of oyster in excavated assemblages dated to the last 2,000 years in estuaries where rock is absent (or minimal) is consistent with an expansion of mangroves.

Another taxon, the telescope mud whelk (*T. telescopium*), is almost entirely absent from middens on the southern Curtis Coast but is the most common shellfish species in many estuaries today, regularly occurring in densities up to 100/m<sup>2</sup> (Fig. 2.8). Shanco and Timmins (1975:153) note this taxon in pools of water amongst the rearward mangroves of Eurimbula Creek. The almost complete absence of *Telescopium* from middens in the area is suggestive of a recent (<200 years) invasion by this species. A single *Telescopium* base has been observed on the surface of the Eurimbula Creek 2 site (see Chapter 11) which dates to within the last 200 years, supporting a recent origin for the proliferation of this taxa in the region. *Telescopium* is frequently recovered from shell middens pre-dating 1,000 BP in northern Australia (e.g. Beaton 1985; Hiscock 1997; Robins et al. 1998:119), where ethnographic data from western Cape York Peninsula indicate that it is a preferred food source (Cribb 1996; Isaacs 1987:176). It therefore seems unlikely that this taxon would not be collected had it been available in the local environment.

Overall, geomorphological data and patterns of mollusc availability are consistent with the establishment of estuarine conditions by 4,000 BP, with small areas of mangroves being progressively replaced by the dense mangrove forests of today. All data suggest that the modern coastal configuration is relatively recent and that, at least since the mid-Holocene, the coastal landscape appears to have consisted at all times of a broad mosaic of estuaries, sedgeland and wetlands.

## Cultural setting

As elsewhere in Australia, introduced diseases and frontier violence caused major reductions in Aboriginal populations in the study area (e.g. Butlin 1983; Campbell 2002). Population reduction in many areas contributed to demographic restructuring to accommodate groups displaced by the advancing European frontier, with remnants of groups aggregating along traditional social lines. Thus by the time European observers started to enter areas such as the southern Curtis Coast, it is likely that significant changes in demographic structures and land-use strategies had already occurred. The ethnohistoric record for the southern Curtis Coast is generally very sparse, with considerable conflict both among documentary sources and between documentary and Aboriginal oral histories (see Clarkson et al. n.d. for a detailed discussion). In one of the earliest discussions of

Aboriginal lifeways in this area, Curr (1887:122, 126) used the term 'Maroonee' to describe the people occupying the coastal areas of Rodds and Bustard Bays and inland to the Many Peaks Range. Mathew (1914) also placed 'Meerooni' in this area. Brasch (1975) suggested that a dialect of Gooreng Gooreng labelled 'Guweng' occurred in this same geographical area. Tindale (1974) termed this group 'Goeng' (also listing Meerooni, Gurang Gurang and Yungkong), and suggested it covered an area from Miriam Vale south to the mouth of Baffle Creek. Popularist accounts (e.g. Buchanan 1994, 1999; Growcott and Taylor 1996) represent the Bustard Bay area as occupied by the Meeroni. Buchanan (1994) recounts a conversation with Elsie and Bertha Bowden in the 1970s who were resident on Middle Island between 1910 and 1974 who stated that the local 'tribe' was called 'Meeroni', although it is unclear whether they derived this term from actual interaction with local Aboriginal people or from second-hand sources. Williams (1981:62) was not certain about including the area fringing Bustard Bay within Gooreng Gooreng country, despite extensive interviews with Aboriginal people from the study area. Clarkson et al. (n.d.) suggested that as the various terms refer to country today identified with Gooreng Gooreng speakers (see also Curr's 1887 language list for the Meerooni of Baffle Creek where 'no' = 'Gooraong'), they are unlikely to refer to the name of languages *per se*, but may be those of dialect groups or subgroups of Gooreng Gooreng (Burke 1993:8).

While Aboriginal people in the study area undoubtedly had links to the north, most of their cultural ties at the time of European contact were to the south. The Gooreng Gooreng language, for example, is more closely related to Gubbi Gubbi and Waka Waka rather than to languages in the Rockhampton area (Jolly 1994). Ethnohistoric accounts document a clear schism between Gooreng Gooreng and Bayali peoples and their Darambul neighbours to the north, which manifested itself in warfare and separate alliance networks (Horton 1994:112).

The very few documentary sources which relate specifically to the southern Curtis Coast begin with Banks' observation on 23 May 1770 of two Aboriginal men walking along the beach just south of Bustard Bay (Beaglehole 1963:65). The following day, a party from the *Endeavour* went ashore at Bustard Bay to inspect the country, noting 'innumerable Oysters, Hammer oysters and many more sorts' and a recently-vacated occupation site:

Those who stayd on board the ship saw about 20 of the natives, who came down abreast of the ship and stood upon the beach for some time looking at her, after which they went into the woods; we on shore saw none. Many large fires were made at a distance from us where probably the people were. One small one was in our neighbourhood, to this we went; it was burning when we came to it, but the people were gone; near it was left several vessels of bark which we conceivd were intended for water buckets, several shells and fish bones, the remainder I suppose of their last meal. Near the fires, for there were 6 or 7 small ones, were as many peices of soft bark of about the length and breadth of a man: these we supposd to be their beds: on the windward side of the fires was a small shade about a foot high made of bark likewise. The whole was in a thicket of close trees, defended by them from the wind; whether it was realy or not the place of their abode we can only guess. We saw no signs of a house or any thing like the ruins of an old one, and from the ground being much trod we concluded that they had for some time remaind in that place (Banks in Beaglehole 1963:67).

Other members of the landing party also reported the tail of a land animal at the camp to those that remained on the ship (Pickersgill in Bladen 1892:218). Setting sail and journeying north the next day Banks noted fires at some distance 'tho not many' (Banks in Beaglehole 1963). Banks also commented on the rich coastal resources of the area:

On the shoals and sand banks near the shore of the bay were many large birds ... On the shore were many birds, one species of Bustard, of which we shot a single bird as large as a good Turkey. The sea seemd to abound in fish ... on the mud banks under the mangrove trees were

innumerable Oysters, Hammer oysters and many more sorts among which were a large proportion of small Pearl oysters (Banks in Beaglehole 1963:66).

Subsequent sources (mainly from ships and exploratory vessels) make passing references to sightings of Aboriginal people, material culture or smoke from campfires in the general region (e.g. Flinders 1814; Oxley 1825; Perry and Simpson 1962). In August 1802, Flinders (1814:15–6) noted bark canoes, turtle remains and scoop nets at the southern end of Curtis Island while the ship's artist made sketches of dwellings. In 1846, MacGillivray (1852:57) made the following observations while visiting Port Curtis:

During our stay at Port Curtis, we had no inter-course whatever with the natives, although anxious to establish friendly communication. With the aid of the spyglass, we could occasionally make out a few, chiefly women, collecting shell-fish on the mud flats of the main land, and their fires were daily seen in every direction.

Although there have been suggestions of patterns of coastal transhumance related to water shortages (e.g. Oxley 1825), early historical sources document the presence of Aboriginal populations on the coast throughout the year (Burke 1993; Clarkson et al. n.d.) and water stored in coastal sandmasses appears to have been perennially available (Buchanan 1999).

The most recent ethnohistoric account for the study area dates from October 1846, when Colonel George Barney on board the *Cornubia en route* to Gladstone encountered Aborigines close to their camp while searching the southern entrance of Bustard Bay for freshwater with which to fill the ship's casks. Barney was shown a small freshwater soak in dense scrub about 100m from the base of Round Hill Head (McDonald 1988:10).

From around 1850 onwards Europeans made increasing inroads into the study region. The Wide Bay and Burnett Pastoral Districts were declared by 1848 and Port Curtis by the 1856 census. The Moreton Bay Penal Settlement had been broken up in 1840 and declared open for free settlement in 1842 but by this time squatters were already at the 50 mile settlement limit (Taylor 1967:40). Taylor (1967:62) notes that in the Burnett and Wide Bay Pastoral Districts, large coastal areas remained unused by Europeans in the early period of settlement and retained resident Aboriginal populations into the late 1850s and early 1860s. Aboriginal oral histories attest to continuing use of the area into the early twentieth century. A senior local Aboriginal community member, Connie Walker (pers. comm., 1999), recalls that her family used to visit the Round Hill Creek area from Greenvale Station, near Lowmead, to fish and to make boomerangs, shields and 'nulla nullas'.

Colonial impact, notably in the form of frontier violence and introduced diseases, precipitated the demographic collapse of local Aboriginal social groups and virtual abandonment of the near-coastal landscape by the late nineteenth century. Of the Tooloola of the Gladstone area to the immediate north, Curr (1887) estimated that by 1882 a pre-European population of 700 had been reduced to 43. During the 1850s, the Native Mounted Police were active in the region and several massacres are known to have occurred in the Miriam Vale area (Clarkson et al. n.d.). In the main, by the late nineteenth century Aboriginal populations in the region had coalesced into fringe camps at major European townships such as Miriam Vale in the west and Gladstone in the north (Roth 1898). Cox (1888) described wax figures taken from an Aboriginal camp at Miriam Vale in 1864 and Roth (1898, 1909) describes nets, clubs and shields made by people living in Miriam Vale at the time of his visit in 1898. Although Aboriginal people may have occasionally visited the area after the 1920s from local Aboriginal population centres such as Berajondo and Gladstone, the entire region was effectively depopulated by the removal of Aboriginal people to reserves and missions (particularly Barambah, Woorabinda and Bogimbah) under the provisions of the *Aborigines Protection and Restriction of the Sale of Opium Act 1897* (Blake 1991; Evans 1991).

Today Gooreng Gooreng people maintain active connections to country on the southern Curtis Coast through a range of activities, including residence, camping, fishing, cultural festivals

and conducting cultural heritage impact assessments. Contemporary Gooreng Gooreng understandings of landscape are informed by a narrative tradition that articulates particular or general features of the natural and cultural world to specific mythological figures, historical figures or events, or to each other (Clarkson et al. n.d.; Williams 1981).

## Previous archaeological research

Knowledge of the archaeological record of the study region was extremely limited prior to the 1990s. In fact, prior to 1993 only eight sites were recorded on the Queensland Environmental Protection Agency's (EPA) Indigenous Sites Database for the study area. This lack is particularly evident in comparison to the extensive investigations conducted in the Central Queensland Highlands to the west (e.g. Beaton 1977; Johnson 1979; Morwood 1979, 1981, 1984; Mulvaney and Joyce 1965; Richardson 1992, 1996; Stern 1980; Walsh 1984), the Keppel and Whitsunday Islands and adjacent coast to the north (e.g. Barker 1989, 1991, 1995, 1996; Rowland 1981, 1982, 1985, 1992, 2002) and the Great Sandy Region and Moreton Bay to the south (e.g. Frankland 1990; Hall 1982; Lauer 1977, 1979; McNiven 1990a, 1991a, 1991b, 1993, 1998; McNiven et al. 2002; Ulm and Hall 1996).

Despite its paucity, archaeological research in the Burnett-Curtis region in fact extends back to the 1890s, when interest arose in the extensive Burnett River Engravings site located in the bed of the Burnett River near Bundaberg. This site was included in early discussions of Aboriginal rock art by Mathews (1897, 1910) and Elkin (1949), as well as in more recent works by Quinnell (1976) and Maynard (1976, 1979). Sutcliffe (1972, 1974), who supervised a salvage operation at the site in the early 1970s, wrote a draft Master of Arts thesis on the salvage process, but apparently never submitted the manuscript for examination. Rola-Wojciechowski (1983) undertook a quantitative analysis of a sample of the engravings at the site as part of her Honours thesis at the University of New England. She suggested that the predominantly non-figurative art displayed affinities with other sites in southeast Queensland, but was distinct from assemblages recorded for the Central Queensland Highlands. Similar conclusions were reached in Chapman's (1999, 2002) recent study of the regional pigment art assemblage.

In the latter part of the nineteenth century and throughout the twentieth century, various Aboriginal artefacts from the general region were donated to or otherwise acquired by private collectors, local museums, the Queensland Museum and the Anthropology Museum at the University of Queensland. Unfortunately, many of these artefacts are not well-documented and it is difficult to determine whether they truly originated in the study area.

In 1915, Hamlyn-Harris conducted a surface collection of 330 stone artefacts and samples of shell from a 'feeding-ground' at Bargara, east of Bundaberg, after the site was brought to his attention by Lionel C. Ball of the Queensland Geological Survey. Ball had donated a small collection of 24 stone artefacts from the site to the Queensland Museum earlier that year. Ball (1915) noted that the 'chips are scattered in some profusion along the summits of the sand ridges' which 'rise immediately behind the beach'. This pattern of site location on beach ridges in the study area has been confirmed by recent research (see Lilley 1994a; Lilley and Ulm 1995; Ulm and Lilley 1999).

Hamlyn-Harris (1915:104) noted 'secondary chipping' or retouch on some artefacts in the collection. The surface collection consisted of 'shells, together with one blank (unfinished) axe of silicified sandstone, two primitive stone tools also made of the same material, a large quantity of flakes, chips, scrapers, drills and gouges made of silicified sandstone, jasperoid, petrified wood, quartz, etc., and a basalt hammer' (Hamlyn-Harris 1915:104). Hamlyn-Harris (1915:104) concluded that many of the raw materials represented in the collection derived from non-local sources and 'had evidently been brought some distance by them for this purpose'. In 1979, this stone artefact collection was analysed by students from the University of Queensland (Findlay 1979; Horsfall

1979; Horsfall and Findlay 1979). The presence of numerous stone artefacts, including retouched flakes, and abundant shellfish remains described for the site led Horsfall and Findlay (1979:6) to suggest a pattern of 'intensive and/or prolonged use of the site'.

In 1970, Marks reported the existence of earthen circles ('bora rings') at Rosedale Station and at Koonawalla and Woodside, both near Bororen. In a 1976 synthesis of archaeological sites in the Wide Bay-Burnett regions prepared by the Queensland Museum, only a single archaeological site is recorded for the study region (a stone arrangement on Hummock Hill Island). From the late 1970s, several archaeological sites in the area were recorded by State Government staff, including the Crevasses Art Site (JE:A25) at Cania Gorge, which was recorded in 1982, and a quarry (KE:A05) and axe grinding grooves (KE:A06) on the coast just south of Agnes Water, recorded in 1978. Smith (1980) reported local advice that a stone arrangement had been destroyed during construction of the road through the Town of Seventeen Seventy. It was not until the mid-to-late 1980s, however, that the number of reported Aboriginal archaeological sites in the study region increased markedly with the growing numbers of surveys carried out by independent archaeological consultants as part of cultural heritage impact studies (see Alfredson 1987, 1989, 1990, 1991, 1992, 1993; Barker 1993; Davies 1994; Duncum 1991; Gorecki 1995; Hall 1980a, 1981, 1985; Hatte 1992; Hill 1978; Lilley 1980, 1994a, 1994b, 1995a, 1995b, 1995c, 1995d, 1995e; Neal 1986; Reid et al. 2000; Spencer 1995; Ulm 2000a, 2001). With the exception of a few broad overviews (e.g. Gorecki 1995), the majority of these consultancy reports have focussed on geographically-limited development impact areas and adopted discovery-oriented research designs rather than predictive site location models. Further, most of these studies have been undertaken in coastal or near-coastal areas, creating a sampling bias against subcoastal and inland parts of the region.

Many of the foregoing surveys report little or no archaeological material (e.g. Alfredson 1989, 1990, 1991, 1992; Hall 1980a, 1981; Hill 1978; Lilley 1994b, 1995a, 1995b, 1995c, 1995d, 1995e; Spencer 1995), although some sites were surface-collected and several subjected to limited analysis (see Alfredson 1987). This apparent scarcity of archaeological material in the region led Alfredson (1990:10) to comment that:

The present survey results are in keeping with the results of the other archaeological surveys conducted in the region. The relatively sparse archaeological record does not indicate a large Aboriginal population inhabiting this part of the coast. It seems that the well-watered country behind the coastal ranges rather the [sic] coast may have been the main focus for the regional Aboriginal population.

On the basis of the small number of artefacts observed east of Monto, Spencer (1995:21) suggested that 'in spite of a richly diverse resource base ... few people lived and foraged here', and concluded that 'more studies in this region will shed further light on this matter, but until then we must assume that the lithic resources had little importance to the Aboriginal occupants of the area' (Spencer 1995:22).

During an impact assessment survey for Awoonga Dam, southwest of Gladstone, Hall (reported by Lilley 1980) identified four sites on the banks of the Boyne River. Only one exhibited significant integrity, the others having been severely disturbed by European activities. Hiscock (1982) conducted the first detailed archaeological investigations and excavations in the study region while following up Hall's (Lilley 1980) original study. Hiscock excavated a total of 1m<sup>2</sup> in addition to recording surface artefact scatters and the attributes of samples of the artefacts they contained. The undisturbed site covered approximately 8,700m<sup>2</sup> and exhibited artefact densities up to 29/m<sup>2</sup>. The assemblage was dominated by flakes but also included cores, retouched flakes and flaked pieces, with artefacts restricted to the top 6cm of the deposit. No organic material suitable for radiocarbon dating was recovered. Hiscock (1982:20) argued that the site was less than 1,000 years old on the grounds that the deposit was shallow, the river bank itself was probably very

recent and the artefacts did not include backed blades or points suggestive of an earlier age. He (1982:19) concluded that the 'archaeological evidence does therefore suggest that Aboriginal activities were concentrated close to the Boyne River'.

In contrast with the foregoing picture, several studies conducted over the last decade have revealed abundant Aboriginal cultural materials in the region, particularly on the coast (Figs 2.2, 2.9–2.11). Long-term local residents in the area were aware of many archaeological sites in the region, concluding that:

Axe flakings and remains of shell fish on Middle Island, Eurimbula, Round Hill Creek and Agnes Water [provide] the evidence that these were the main camping grounds of the Meerooni in the Bustard Bay area (Growcott and Taylor 1996:5).

In 1986 two shell middens were recorded by Neal (1986) on the west bank of Seven Mile Creek as part of an environmental impact assessment. In the same year, Rowland (1987) conducted a 'broad cursory investigation' of the study area as part of general surveys of the coast between Elliott Heads and Turkey Beach. Prior to his survey, only nine sites were recorded on the Queensland State Site Register for the Bundaberg 1:250,000 map sheet. Rowland located a further seven sites, although only one, KE:A11 just to the south of the Town of Seventeen Seventy, was reported to be of any significant size. Rowland (1987:17) noted that 'substantial middens are rare', sites are located 'either atop rocky headlands or in sheltered estuaries', and that 'smaller scatters of shells are located along open beaches'. He (1987:17) concluded that:

Whether this is a true reflection of Aboriginal settlement patterns in the area or an expression of geomorphological factors affecting preservation and visibility is a problem still to be resolved. Certainly the extent of erosion along the open coastal dune systems of the area would suggest that the loss of sites may be an important factor affecting the above pattern.

Two other localised surveys have been conducted in the area, one on Facing Island (Ringland 1978), where seven extensive shell midden sites were located, and one taking in part of Eurimbula National Park, where an extensive stratified midden deposit on the western bank of Round Hill Creek was identified (later registered as KE:A49–KE:A54) (Godwin 1990).

In 1993, Burke (1993) conducted selective surveys of the coast between Raglan Creek in the north and Agnes Water in the south and up to 1km inland from the mainland coastline as part of the Curtis Coast Scan project (see QDEH 1994). Although it extended south to overlap with Rowland's survey at Round Hill Creek, Burke's study was primarily concerned with the area to the north of Rodds Peninsula. In the southern Curtis Coast study area, Burke (1993) documented 93 sites, including shell middens (n=77), stone artefact scatters (n=12), quarries (n=2), stone-walled fishtraps (n=1) and scarred trees (n=1). Overall, Burke (1993) found that sites were most commonly located on level or gently inclined dune surfaces in low energy estuarine environments.

## Gooreng Gooreng Cultural Heritage Project

Since 1993, archaeological surveys and excavations have been undertaken on the southern Curtis Coast as the coastal component of the Gooreng Gooreng Cultural Heritage Project, augmented by a number of cultural heritage impact studies (Lilley 1994a, 1995e). Together these investigations were designed to expand the scope of the earlier, more limited or project-specific surveys discussed above. Of particular interest were questions concerning the antiquity of human occupation in the coastal region and whether the concentration of sites in estuaries and near absence of material on ocean beaches noted by Rowland (1987) reflected past Aboriginal behaviour, recent geological processes or patterns of archaeological research.



Figure 2.9 Northern segment of the southern Curtis Coast study area showing recorded archaeological sites as triangles in the Hummock Hill Island and Seven Mile Creek areas. EPA site numbers are shown. Sites without a 'JE:' prefix have a 'KE:' prefix which has been omitted owing to space limitations.

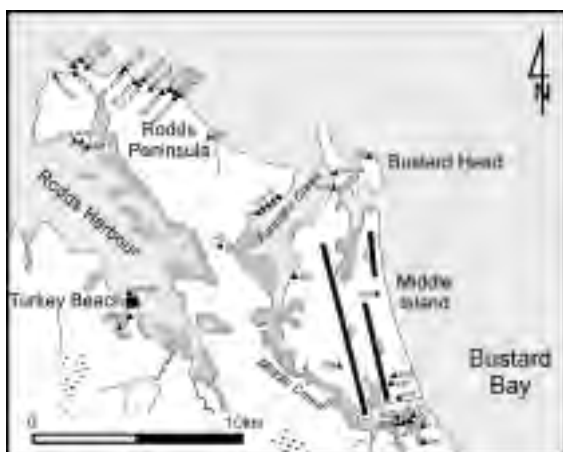


Figure 2.10 Central segment of the southern Curtis Coast study area showing recorded archaeological sites as triangles in the Turkey Beach, Rodds Peninsula and Middle Island areas. EPA site numbers are shown where available. Sites without a 'JE:' prefix have a 'KE:' prefix which has been omitted owing to space limitations. Sites with a 'SCC' prefix are currently unregistered sites.

On the coast, systematic site surveys undertaken as transects were conducted in all major environmental zones including open beaches and rocky headlands, marine estuary, swamp and wetland margins, and the coastal ranges. To date, however, the majority of investigations have focussed on near-coastal landscapes. The entire open coastline between Wreck Rock and Richards Point has been systematically surveyed, as have the lower estuarine margins of Round Hill, Eurimbula, Middle, Jenny Lind, Pancake, Falls and Mort Creeks (Figs 2.1, 2.9–2.11). Inland areas have proven more difficult to access owing to restricted access to freehold land, a lack of visibility and an absence of access tracks in many areas. The whole of Middle Island was intensively surveyed by Lilley (1994a) using a grid of drilling-lines graded across the island for mineral sand exploration. Some small transects have also been undertaken on the northeast margin of a large swamp which dominates the western half of the Deepwater Section of Eurimbula National Park and parts of Round Hill National Park (Lilley et al. 1997). Poor visibility away from coast and estuary margins was found to be a major impediment to site detection (see also Burke 1993:23, 32–3).

Survey crews were deployed to sample the different micro-environments that were encountered. The general strategy involved walking through the subject area in line-abreast at one visual distance separation between walkers and up to 50m in total width, focussing on areas of high ground surface visibility. In some areas, the crew was split into two teams to examine different zones, such as foredunes and backdunes, simultaneously. While field crews took advantage of every opportunity to examine soil profiles in road cuttings, creek banks and the like, no excavation, augering or other subsurface testing was undertaken during the survey phase of the study (cf. Burke 1993:23–4). Site locations were established with the use of topographic maps, aerial photographs and Global Positioning System (GPS) readings.

A major complication in effectively conducting and evaluating archaeological survey data from the region was a lack of access

to the earlier site recordings made by Burke (1993) and held by the Queensland Environmental Protection Agency. Although abbreviated survey results are available in Burke's (1993) report, an absence of detailed site descriptions and inconsistencies in location data prevented accurate ground-truthing of previously recorded sites. These details have recently been obtained under the provisions of the *Freedom of Information Act 1992*. As a result of these problems, some of the sites reported by Lilley et al. (1997:Table 2) had already been recorded by Burke (1993). Further confusion arose as some of the pre-allocated EPA site numbers assigned to Burke had already been allocated to other sites by the time they came to be registered (Melissa Carter, Queensland Environmental Protection Agency, pers. comm., 1999) and many of Burke's sites were subsequently conflated on the basis of proximity when entered onto the database (Burke's original 93 sites from this area were registered as only 51 sites). Additionally, Burke (1993:Appendix 5) assigned the same pre-allocated site numbers to more than one site on a number of occasions (e.g. KE:A37–KE:A40, KE:A44–KE:A46), which was not addressed during the registration process. It should be noted that most of the site numbers listed in QDEH (1994:Appendix XVI) were among Burke's (1993) pre-allocated site numbers, which were superseded when registered by the Queensland Environmental Protection Agency. To simplify the multiple site designations, Appendix 3 presents a key which links actually-registered sites to Burke's (1993) field numbers and pre-allocated site designations, as well as those assigned by other researchers, including those employed on the Gooreng Gooreng Cultural Heritage Project.

Appendix 2 is an attempt to synthesise the survey data for the area included in Rowland (1987), Burke (1993), Lilley et al. (1997) and the Queensland Environmental Protection Agency's (EPA) Indigenous Sites Database (obtained under the *Freedom of Information Act 1992*). This task was complicated by variations in site definitions and recording strategies combined with problems in site provenance data related primarily to inadequate location data. For example, the site Lilley et al. (1997) and Ulm et al. (1999a) refer to as Eurimbula Site 1 (SCC43) is registered as six separate sites on the Queensland Environmental Protection Agency site database (KE:A49–KE:A54), which is a secondary conflation of Burke's (1993) original 20 separate sites.

Clearly, these variations would render spurious any absolute quantitative comparisons between the sites presented in Appendix 2. The general descriptions of the nature of observed archaeological materials, however, provide a basis for broadly characterising the archaeological record of the study region.

A total of 79 Aboriginal cultural places is listed in Appendix 2, including recording details, basic location data and a brief site description. In most cases this description includes all information available for the site. Figures 2.9–2.11 show site locations. Site types include stone quarries, axe grinding grooves, stone-walled tidal fishtraps (Fig. 2.12), scarred trees (Fig. 2.13), shell middens (Figs 2.14–2.16), stone artefact scatters and contact period sites. Low density shell middens are clearly the most common archaeological expression of Aboriginal behaviour in the area, dominated, without exception, by mud ark (*A. trapezia*) and/or rock oyster (*S. glomerata*) (see also Burke 1993:40). Stone artefacts are commonly associated with larger shell middens (Fig. 2.17) and/or rocky headlands. Lithic raw materials are dominated by locally available rhyolitic tuff and



Figure 2.11 Southern segment of the southern Curtis Coast study area showing recorded archaeological sites as triangles in the Agnes Water, Round Hill Creek, Eurimbula Creek and Middle Creek areas. EPA site numbers are shown. All sites have a 'KE:' prefix which has been omitted owing to space limitations.

quartz with occasional non-local silcrete and banded rhyolite artefacts. Flaked glass artefacts also occur on the surface of two large shell midden complexes. Several glass artefacts exhibit clear evidence for use in plant processing activities (Ulm et al. 1999b).

These extensive surveys have revealed a consistent pattern of site location. Extensive, stratified shell midden deposits with evidence for multiple occupations and diverse activities are limited exclusively to tidal estuary margins in close proximity to their mouths. Such sites have been located on the northern and southern banks of Round Hill, Middle and Pancake Creeks. All are exposed in erosion faces extending over several kilometres. Relatively small, low density surface scatters of marine shell and stone artefacts made on local materials were noted on exposed headlands. Low density single-taxa scatters of shellfish remains on exposed coastal headlands are likely to be accumulated by birds rather than humans (especially Pacific gulls) (see Claassen 1998:72). Although occasional artefacts are encountered on these headlands, they have not been noted to co-occur with shell scatters. The extremely exposed situation of these shell deposits means that they are unlikely to survive long periods of time, with the absence of sediments preventing the possibility of burial. Midden deposits on the open beaches themselves were generally very limited in extent and composition and often deflated. Beach ridges and transgressive dunes located adjacent to the modern coastline contain abundant, extensive but shallow site complexes (Lilley 1994a; Lilley and Ulm 1995).

Prior to the commencement of the research reported in this monograph, two of the largest complexes of shell midden deposits in the area were test excavated: the Mort Creek Site Complex (KE:A41) on the west bank of Mort Creek at the northern end of Rodds Peninsula (see Chapter 7 for details) and Eurimbula Site 1 (KE:A49–KE:A54) on the west bank of Round Hill Creek (see Chapter 12 for details). The sites were radiocarbon dated to 2,300 cal BP and 3,200 cal BP respectively.

## Other dated archaeological sites in the region

In addition to the eight excavated and radiocarbon dated sites discussed at length in this monograph, four other sites were subject to basic recording and radiocarbon dating. Results are briefly described below and are incorporated into the regional synthesis in Chapter 14.

Table 2.2 Radiocarbon dates from unexcavated sites in the study region (see Appendix 1 for full radiometric data for each determination). ABM=Agnes Beach Midden; MISS=Middle Island Sandblow Site; RHCM=Round Hill Creek Mound; WCM=Worthington Creek Midden. Dates on shell were calibrated using a  $\Delta R$  value of  $+10\pm 7$ , except Wk-10090 where  $\Delta R = -155\pm 55$  (see Chapter 4 for further details).

SITE	SQUARE	XU	DEPTH (cm)	LAB. NO.	SAMPLE	$\delta^{13}\text{C}$ (‰)	$^{14}\text{C}$ AGE	CALIBRATED AGE/S
ABM	-	-	-	Wk-10969	charcoal	-27.1±0.2	266±87	485(289)0*
ABM	-	-	-	Wk-11280	<i>D. deltoides</i>	0.8±0.2	674±47	420(294)247
MISS	A	1	0	Wk-7679	<i>D. deltoides</i>	1.1±0.2	980±50	642(545)494
MISS	B	1	0	Wk-10091	<i>D. deltoides</i>	0.9±0.2	730±39	452(362)282
MISS	C	1	0	Wk-10092	<i>D. deltoides</i>	1.2±0.2	958±40	620(534)492
MISS	D	1	0	Wk-10093	<i>D. deltoides</i>	0.9±0.2	559±42	279(234)0*
RHCM	-	-	-	Wk-10090	<i>A. trapezia</i>	-0.3±0.2	1910±42	1810(1623)1482
WCM	-	-	5	Wk-10089	<i>S. glomerata</i>	-3.4±0.2	349±60	modern

### Agnes Beach Midden (ABM)

Recent storm-surge activity exposed a small discrete *in situ* layer of shell dominated by pipi (*D. deltoides*) and stone artefacts in a truncated frontal dune on the high energy beach adjacent to the town of Agnes Water (Latitude: 24°12'28"S; Longitude: 151°54'12"E) (Figs 2.11, 2.14). This layer of

shell is part of a shell midden/artefact scatter originally recorded by Rowland (1987) and re-recorded by the author (Lilley et al. 1997; Ulm and Lilley 1999). The site comprises several small, low density surface scatters of shell and occasional stone artefacts. The site is registered on the Queensland Environmental Protection Agency's (EPA) Indigenous Sites Database as KE:A10 and KE:A87 and Queensland Museum Scientific Collection Number S233 (Fig. 2.11). Despite extensive surveys this is one of the few stratified deposits containing organic material located on the open coast in the study region. After cleaning back the erosion section, a small area (10cm × 10cm × 10cm) of the *in situ* layer was removed *in toto* for laboratory analysis. Two radiocarbon dates were obtained from the recovered material to investigate local open water marine reservoir factors (see Chapter 4 for further details). The shell sample comprises valves of pipi while the charcoal sample is based on large blocky fragments of charcoal removed from the exposed lens in direct association with the shell fraction. The shell/charcoal pair (Wk-11280/Wk-10969) indicate that this site was occupied around 300 years ago (Table 2.2).

### Middle Island Sandblow Site (MISS)

The Middle Island Sandblow Site is an extensive shell and stone scatter exposed on the surface of the sandblow located on the northeast section of Middle Island, immediately south of Bustard Head. The exposure is c.2.8km long and covers a minimum area of 140,000m<sup>2</sup>. The approximate centre of the site is situated 15.5km northwest of Round Hill Head (Latitude: 24°03'44"S; Longitude: 151°45'56"E). The site is registered on the EPA's Indigenous Sites Database as KE:A67 and Queensland Museum Scientific Collection Number S234 (Fig. 2.10). It is located on the eastern, active face of the sandblow, parallel to the ocean beach to the east and bordered by Jenny Lind Creek to the north and west. The vast majority of shell and stone material is exposed immediately upslope of extensive pumice rafts located on a low area of trailing dunes, partially vegetated by dense stands of immature black she-oak (*Allocasuarina littoralis*) separating the active sandblow from



Figure 2.12 Stone-walled tidal fishtrap at Richards Point on Rodds Peninsula. This is one of two such features recorded in the study region. The second fishtrap is located in Mort Creek 4km to the south (see Chapter 8). Facing north (Photograph: Ian Lilley).



Figure 2.13 Scarred tree on eucalypt at Agnes Water (KE:A60) (Photograph: Environmental Protection Agency).

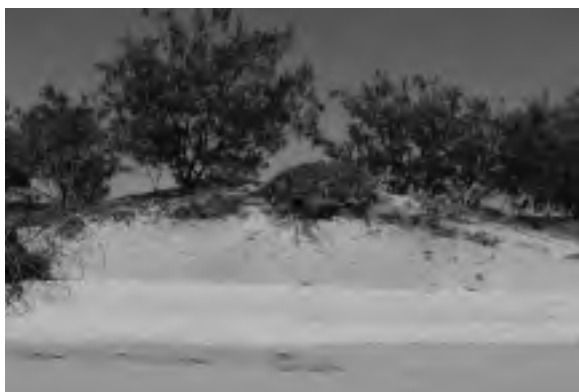


Figure 2.14 Agnes Beach Midden. Facing southwest.



Figure 2.15 Worthington Creek Midden. Facing northwest.



Figure 2.16 Middle Island Sandblow Site, showing pipi (*D. deltoides*) scatter on the surface of the sandblow. A range of cultural and non-cultural material is exposed on the eastern margin of the sandblow. Facing north.



Figure 2.17 Middle Island Sandblow Site, showing microgranite grinding implement located on the surface of the sandblow. Obviously modified and apparently unmodified pieces of stone are common along the eastern margin of the sandblow. Facing south.

the frontal dunes bordering the beach. Cultural deposits of shell and stone have been artificially concentrated by active dune-building processes resulting in deflation and conflation of archaeological materials onto a surface which continues to be differentially exposed by recent sand movement. Shell densities range from  $<1/m^2$  to  $150/m^2$  across the site (Fig. 2.16). In all areas, pipi (*D. deltoides*) dominates the shellfish assemblage, comprising at least 99% of all visible shellfish remains. Other shellfish taxa include lined nerite (*Nerita lineata*), hercules club whelk (*P. ebininus*), rock oyster (*S. glomerata*) and mud ark (*A. trapezia*). In addition, occasional toothless clam (*Anodontia edentula*) and pearly nautilus (*Nautilus pompilius*) shells were also noted. The pearly nautilus is a deep water species which is sometimes washed up on eastern Queensland beaches. While not documented as a food source, historical records document the use of nautilus shell to manufacture oval-shaped pendants at Cooloola and Fraser Island to the south (McNiven 1998). Occasional stone artefacts are distributed across the site (Fig. 2.17). The remains of at least six macropods, four birds and five cattle were also observed, all thought to be of a very recent origin.

Burke visited the site area during surveys conducted in 1993. While no mention of it is made in either of the two reports arising from the Curtis Coast Scan project (Burke 1993; QDEH 1994), notations made on the mounts of Burke's 35mm slides of this area held by the EPA include the words 'not cultural'. The cultural status of at least parts of this deposit was recognised by Lilley

and Ulm in 1994 (see Lilley 1994a). Although all cultural material appears to be restricted to the surface, the site is significant as the only large open beach archaeological site known between Fraser Island to the south and Facing Island to the north. During June 2001, basic attributes of all stone material visible on the surface of the sandblow was recorded. Five test excavations (Squares A–E) were also conducted, spaced across the length of the exposure to assess the subsurface extent of the site and to obtain samples for radiocarbon dating.

In total, 342 pieces of stone weighing over 300kg were recorded across the eastern margin of the sandblow. The assemblage included backed blades, flakes, broken flakes, flaked pieces, cores, hammerstones and grinding implements manufactured on a range of raw materials including rhyolitic tuff, microgranite, quartz, quartzite and silcrete. Most of the stone assemblage, however, is not obviously modified and its cultural status remains equivocal. Excavation revealed that all cultural material is restricted to surface deposits. The excavated material was dominated by pipi (*D. deltoides*) with minute quantities of bone, non-artefactual stone and pumice (Table 2.3). The shell valves were very friable, probably reflecting long periods of sun-bleaching and physical erosion by wind-blown sand particles. Given the high mobility of the sandmass and the completely unconsolidated sediments, none of the exposed cultural material is thought to be in primary depositional context. The four radiocarbon dates available for the site were obtained on samples of pipi (*D. deltoides*) valves (Table 2.2). The dates indicate that much of the material currently exposed on the surface dates to the last 500 years.

Table 2.3 Middle Island Sandblow Site, Squares A–E: summary excavation data and dominant materials.

SQUARE	SIZE (m <sup>2</sup> )	DEPTH (cm)	VOLUME (l)	pH	PIPI (g)	OTHER SHELL (g)	BONE (g)	ROCK (g)	CHARCOAL (g)	ORGANIC (g)
A	0.25	10	40	8.5	124.4	-	1.1	1.9	-	2.2
B	1	5	c.100	7	197.4	-	<0.1	-	0.1	0.8
C	1	5	c.100	NA	152.9	22	<0.1	3.6	<0.1	2.1
D	1	5	c.100	NA	734.4	-	0.1	0.3	0.2	35
E	1	5	c.100	NA	-	115	-	1.8	-	<0.1
Total	4.25	-	c.440	-	1209.1	137	1.2	7.6	0.3	40.1

### Round Hill Creek Mound (RHCM)

The Round Hill Creek Mound is a large shell mound located in open eucalypt woodland on a low rocky terrace close to the eastern margin of Round Hill Creek (Latitude: 24°12'09"S; Longitude: 151°51'56"E). Dense shell material is spread over an area of at least 16m x 10m with a minimum depth of 50cm visible in an exposed section created by bulldozer activity. The visible assemblage is dominated by mud ark (*A. trapezia*) with oyster (*S. glomerata*), stone artefacts, bone and charcoal also noted. The site was initially recorded by Rowland (1987) and subsequently visited by Godwin (1990), Burke (1993) and the author (Lilley et al. 1997; Ulm and Lilley 1999). The site is registered on the EPA's Indigenous Sites Database as KE:A16 and Queensland Museum Scientific Collection Number S235 (Fig. 2.11). A radiocarbon date was obtained on a sample of *A. trapezia* valves removed from an apparently undisturbed area half-way down the exposed section (Table 2.2). The date indicates that the site was in use around 1,600 cal BP.

### Worthington Creek Midden (WCM)

The Worthington Creek Midden is an extensive, shallow, linear shell midden exposed in section on the west bank of Worthington Creek (Latitude: 24°07'25"S; Longitude: 151°40'59"E). The midden material is located along the top margin of a high (c.4m) creek erosion bank (Fig. 2.15). Sandstone is exposed at the base of the section, overlain by a thick layer of light brown clays and a thin veneer of eroding top soils containing the shell material. Shell is visible along a segment of bank 350m in

length and up to 5cm deep. The shell assemblage is dominated by oyster (*S. glomerata*) with scallop (*Pinctada albina sugillata*) the only other taxon observed. This site has not yet been assigned an EPA site number and has the Gooreng Gooreng Cultural Heritage Project identification number of SCC64. It is registered as Queensland Museum Scientific Collection Number S236. A radiocarbon date was obtained on a small sample of oyster (*S. glomerata*) valves removed from an apparently undisturbed area containing the deepest material visible in the erosion section. It should be noted that oyster was the only sample material available and it is acknowledged that oyster is not ideal for radiocarbon dating purposes owing to uncertainties introduced by the growth structure of the shell (Wang and van Strydonck 1997). The 'modern' result dates occupation of the site to the recent past, although the subsurface context and absence of European materials confirms an Aboriginal origin for the deposit (Table 2.2).

## Discussion

At this stage it is unclear how processes of erosion and progradation on the exposed coast have affected the differential preservation and visibility of sites, as has been observed elsewhere (e.g. Bird 1992; Godfrey 1989; Head 1987; Rowland 1989). Intensive surveys of the open coastline suggest an almost complete absence of cultural material on the low frontal dunes bordering the ocean beach and a preponderance of material on the lower margins of major estuaries. That this pattern is an accurate reflection of past Aboriginal behaviours rather than an artificial pattern created by differential preservation of cultural materials by erosion of the exposed coast is supported not only by the absence of material on current coasts, but also by the absence of cultural material on particular coastal landforms. Although scatters of midden shell and stone artefacts have been recorded on numerous headlands on the exposed coast, they are very sparse compared to the abundance of material on estuary margins, suggesting a qualitative pattern of settlement preference in these areas. This pattern may in part reflect patterns of resource distribution, with lower creek margin sites often situated adjacent to a range of potential resource zones. Significantly, despite the proximity of large midden deposits on the lower estuaries to open beach habitats (in some cases <100m), only very occasional pipi (*D. deltoides*) valves have been observed or recovered from excavated deposits. Only one site in the region, the Middle Island Sandblow Site (KE:A67), contains significant quantities of this species. *D. deltoides* is the diagnostic signature of Aboriginal use of open coasts in southeast Queensland (e.g. Hall 1980b; McNiven 1990a, 1998). The pattern on the southern Curtis Coast suggests that either this species was consumed and discarded at locations other than those identified, and which have been obscured or destroyed by erosional processes, or that the open coast was not a primary focus of resource extraction in this region.

McNiven (1985, 1989) identified a similar pattern at sites at the mouth of the Maroochy River and on the Inskip Point peninsula at Cooloola. He suggested that in southeast Queensland 'major ocean beach shellfish (i.e. pipi) exploitation only occurred in contexts far removed from estuarine environments' (McNiven 1989:47), arguing that estuarine environments were preferentially exploited by people over the open beach owing to a greater productivity and diversity of resources in estuaries.

Results of previous archaeological work confirm Aboriginal occupation of the coast in this region from at least 3,000 BP, and conform with other dates obtained for the Queensland coast (Ulm et al. 1995; cf. Nicholson and Cane 1994). In particular, the dates are similar to the earliest dates obtained at the site of Booral in the Great Sandy Straits to the south (Bowen 1998; Frankland 1990), as well as those from the Keppel Islands just to the north (Rowland 1985, 1992). The general structure of the archaeological record of the region is qualitatively similar to adjacent areas to the north (Burke 1993; Border 1994) and south (McNiven 1990a, 1998) which have featured in

discussions of late Holocene change in Aboriginal societies on the Queensland coast (e.g. McNiven 1999; Ulm and Hall 1996). The investigation of the archaeological resources of the southern Curtis Coast therefore has the potential to contribute to discussions of these wider issues.

## Summary

The overview presented in this chapter is a baseline synthesis of the physical environment and known archaeological resources in the study area. High rates of floral and faunal diversity in the study region are related to its position as a transitional zone between temperate and tropical provinces. Although the present configuration of the coastal environment was largely created by Holocene sea-level rise, the major landscape features appear to have been in place shortly after the last major shift in sea-levels around 4,000 BP, with shoreline progradation the major active landscape process since that time. Preliminary investigations demonstrate that the southern Curtis Coast exhibits a rich and diverse archaeological record dating to the late Holocene which has the potential to contribute to discussions of wider issues in southeast Queensland archaeology.