BRIDGWATER BAY: A SUMMARY OF ITS GEOMORPHOLOGY, TIDAL CHARACTERISTICS AND INTERTIDAL CULTURAL RESOURCE

by Richard McDonnell

Introduction

This paper is a modified extract drawn from a fuller, more detailed account of a rapid preliminary assessment of Gore Sand and Stert Flats in Bridgwater Bay. That report was prepared on behalf of the Royal Commission on Historic Monuments, England and includes additional sections on methodology, hazards and procedures, conclusions and recommendations for future work (McDonnell 1995). The associated record forms, graphics and photographic archive generated by that assessment can be consulted at the National Monuments Record Centre (NMRC), Swindon. The field assessment was undertaken over the winter of 1993-94 and the spring and summer of 1994. The desk based assessment of the locally available aerial photographic and cartographic evidence was undertaken at the same time. The assessment follows a preliminary pilot survey of part of the area (McDonnell 1993b).

Bridgwater Bay, in the County of Somerset, is located at the eastern end of the Bristol Channel immediately downstream of the Lower Severn Estuary (Figure 37). It is a hyper-tidal coastal plain estuary formed by the north-facing coast between Hinkley Point and the mouth of the River Parrett and the west-facing coast between that estuary and Brean Down. The Somerset Levels lie immediately to the east and are fronted by the bay (Figure 37). The area is described in detail in McDonnell (1995).

The rapid, preliminary assessment was undertaken on the two areas of Stert Flats and Gore Sand that comprise the central and south-western end of the bay and extend for approximately 36 square km. The western limit of the area is a line drawn north from Hinkley Point and the northern limit a line drawn westwards from the wreck of the Nornen on the southern end of Berrow Flats. The vertical range of the assessment generally lay between High Water Springs (HWS) and Chart Datum (CD).

The north-facing coast between Hinkley Point and the mouth of the River Parrett comprises low lying marine alluvial deposits on which are developed ground water gleyed soils of the Newchurch 2 Association (Mackney *et al.* 1983). The surface of the alluvium is at 6 m OD and is fronted by shingle built storm beaches. These features extend for the whole length of this part of the coast at Stolford, Wall Common, Steart Marsh, Steart and Stert Point, though are significantly less pronounced towards the east. Between Steart Marsh and Stert Point the undulating surface suggests that the settlement of Steart lies on an area of stabilised dune sand. The movement of shingle and other material along this stretch of the coast is from west to east (Kidson and Carr 1961).

The west-facing coast between the mouth of the Parrett and the northern limit of the assessment area is similarly composed of marine alluvium, with its surface at 6 m OD, on which are developed the same ground water gleyed soils. At Burnham-on-Sea new sea defences, built after the town was badly flooded by winter storms during the early 1980s, extend from the mouth of the River Brue northwards for nearly 2 km. The eastern end of Gore Sand, or the southern end of Berrow Flats, is backed by a dune complex that is up to 500 m wide and extends for 9 km northwards to Brean Down. Within the

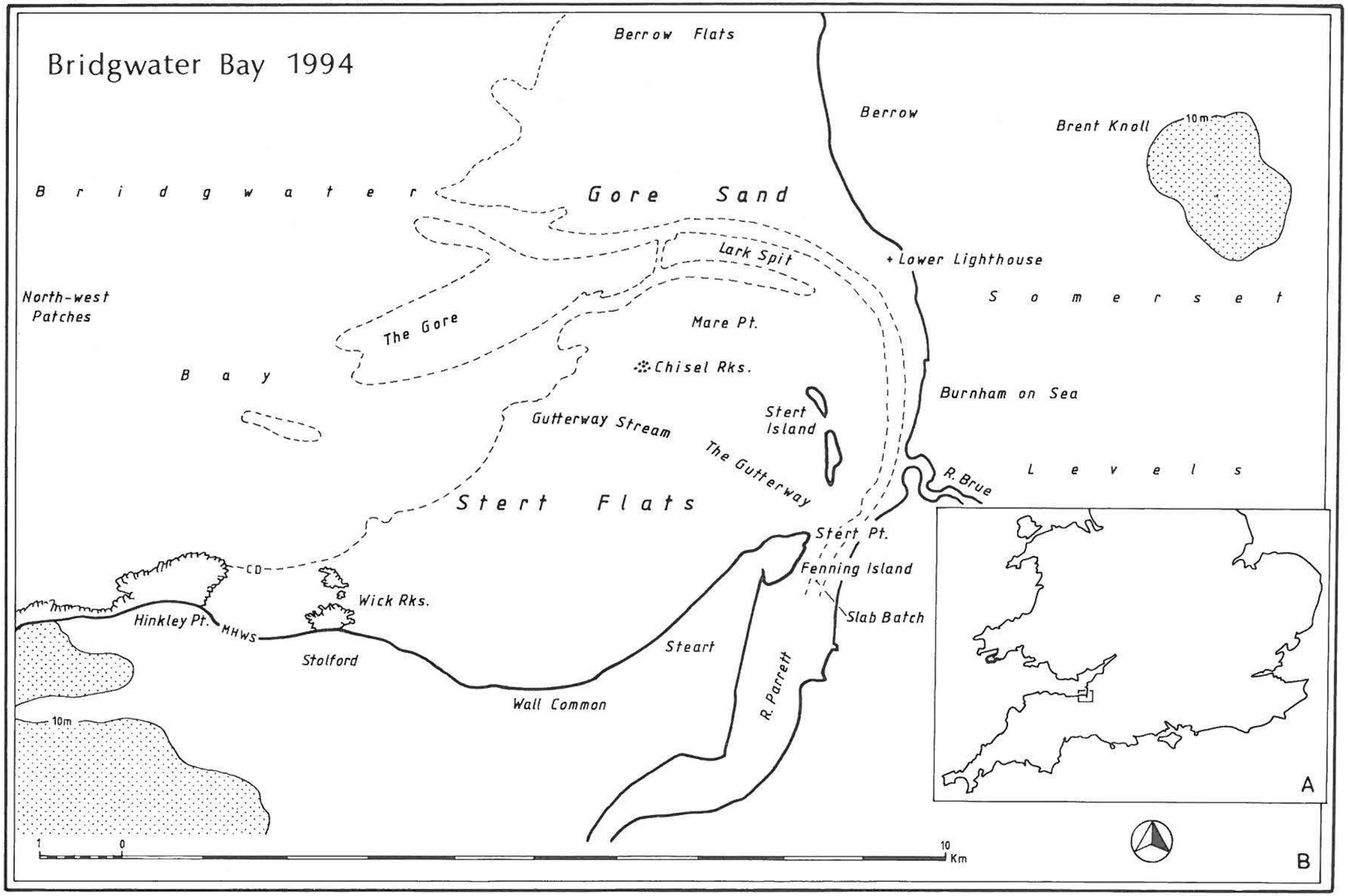

Figure 37. Bridgwater Bay: Location plan and named features mentioned in the text.

area of this assessment it extends for 2.5 km and has a maximum width of 500 m. Within that width it contains a fairly extensive area of marsh with dominant vegetation stands of *Phragmites australis*. The dune fronts are unstable and are retreating inland.

Area status

The recognised status of Stert Flats and Gore Sand is based on the nature conservation value of these areas. Stert Flats was designated as a National Nature Reserve (NNR) in 1954, primarily as a wildfowl refuge. In 1976, under the terms of the Convention on Wetlands of International Importance held at Ramsar, Iran in 1971, the bay was designated a RAMSAR site in recognition of its importance for wintering wildfowl and waders. The whole of Bridgwater Bay, including the NNR, was designated as a Site of Special Scientific Interest (SSSI) in 1989 and in 1993 a Marine Consultation Area (Hancock 1993). The area inland of the sea wall between Stolford and Steart is designated by the Somerset County Council (SCC) as a Special Landscape Area.

There are no Scheduled Ancient Monuments or County Council designated Areas of High Archaeological Potential (AHAPs) in the area of the assessment.

Geomorphology

The intertidal deposits and stratigraphy of Bridgwater Bay have been described by Kidson and Heyworth (1976), briefly summarised by the Geological Survey (Whittaker and Green 1983) and examined in more detail by the Severn Tidal Power Group (STPG 1993). The following descriptions are based on those sources and the results of the preliminary field assessment.

Bridgwater Bay and the coastal margins of this part of the Somerset Levels are formed by deposits of Holocene sediments infilling a buried valley whose base lies 30 m below OD (Whittaker and Green 1983). These deposits contribute to the particularly wide shore platform that is up to 3 km wide and cuts across Quaternary sediments and Triassic rock outcrops.

The Pleistocene gravels in the bay are thought to be the same material as the deposits of gravelly head that extend north-eastwards from the Quantock Hills (Whittaker and Green 1983; Edmonds and Williams 1985). Rounded Devonian Sandstone pebbles have been occasionally recorded both intertidally and sub-tidally during this assessment. Overlying the rock and Pleistocene gravels are the deep estuarine sediments resulting from the sea level rise during the Holocene. Within these clays are brackish and freshwater peats that can be as much as 2 m thick (Kidson and Heyworth 1976). The basal peats, representing the vegetation of the valley floor, have been radiocarbon dated to 8400BP (Heyworth and Kidson 1982). The main exposures are at Stolford where the date range for the peats covers the period from 7000BP, for the material at MLWS, to 3000BP for the material on the upper foreshore in front of the storm beach (Kidson and Heyworth 1973). Submerged forest remains are also present in association with the lower layers of peat. A number of radiocarbon dates ranging from 7000BP to 3500BP have been obtained from the Stolford oak samples (Heyworth and Kidson 1982).

There are no records of intertidal exposures of Burtle Sand in Bridgwater Bay.

Mobile deposits

The interpretation of the stratigraphy in the intertidal area is complicated by the presence of mobile deposits of shingle, sand and mud (Kidson and Heyworth 1976). These are the three principal types of material that are currently mobile within the bay.

The Holocene shingle is considered

to be derived from both solid rock outcrops, particularly Liassic Limestone pavements (Kidson 1960; STPG 1993), and from the Pleistocene gravels (Kidson and Heyworth 1976). Shingle occurs throughout the whole tidal range, though Kidson and Heyworth considered it to be mobile only in the upper part of the range; this material forms the current storm beaches between Stert Point and Hinkley Point. Shingle ridges that occur lower down the tidal range were considered to be 'fossil' storm beaches formed at a time of lower sea level (*ibid.*). Recent studies, however, report a highly mobile shingle regime in the lower part of the tidal range (STPG 1993). During this assessment shingle ridges, domes and spreads were recorded, predominantly on Stert Flats in the mid to upper parts of the tidal range with an increase in incidence to the west of Stert Island. It is worth remembering that the shingle complexes now at MHWS will have been rolled up slope, as a result of rising sea levels, across the surface of the peat and submerged forests. Beach drift experiments between Lilstock and Stert Point have shown that the movement of this material, alongshore, is extremely slow and generally from west to east (Kidson and Carr 1961). Despite this slow movement considerable changes were noted in the shingle complexes at Catsford Common and at Stert Point between 1957 and 1964 (Carr 1965).

The intertidal deposits of sand are mobile throughout the entire tidal range. Significant changes in both height and distribution of this material were noted over a matter of only three or four tides during this assessment, especially in the mid to lower part of the tidal range. The sand appeared to be the most dynamically mobile deposit and could completely obscure the remains of a large fish weir over a matter of only a few days.

The local reports of extensive areas of quick sand in the bay were found to be exaggerated and appear to have been developed as part of a local mythology nurtured by the perceived bleak wilderness of the area. Quick sand was reported along the northern bank of the intertidal Parrett near the Lower Lighthouse but was not encountered here during this assessment. To the west of Stert Island there are deposits of sand, in the bottom and on the south side of the Gutterway, that cannot be crossed on foot. The sand appears to retain water in suspension and, though appearing firm and dry, becomes fluid when foot pressure is applied. There are varying degrees of fluidity which may be related to the height of the tide. It was not, however, found to be a significant problem during this assessment.

The deposits of mobile mud mask vast areas and are cited as the dominant sediment type in the intertidal area of Bridgwater Bay (Whittaker and Green 1983). Depths of up to 2 m were recorded by Kidson and Heyworth (1976) who considered that much of this material probably resulted from the reworking of older muds held in abandoned river channels. The work of the STPG suggests that some of it may derive from the eroding Holocene sediments in the mid to upper tidal range. These mobile deposits tend to increase in thickness in the lower part of the intertidal area and in the immediate sub-tidal area (STPG 1993). The advice from various sources of local knowledge that the mud tends to lift off during the winter months was not confirmed by the experience of this assessment. Over the winter of 1993-94 there was no appreciable reduction of these deposits until the end of January. The reduction was then very slow and some areas, throughout the whole tidal range, were never clear of this material, especially the areas in the mid and lower tidal ranges. There were, however, occasions when the mud was found to be cleared from limited areas and occasions when new deposits of mud would appear within a matter of a few tides, though in both cases this was generally a localised phenomenon.

The mobile deposits of mud are a particular problem; they not only mask large areas of the intertidal surface but also prevent pedestrian access to other areas. On the mid and upper parts of the intertidal surface mud as deep as 700 mm can be traversed on foot when it lies on the surface of the Holocene deposits, on sand or on shingle. Lower down the intertidal range, off the coastal shelf, there is often no feeling at all of a firm, underlying base. Although mud of this type can be walked through for short distances it is arduous and the distance from shore, of anything between 3 and 4 km, creates an unacceptable, additional risk.

The central, southern and western parts of Stert Flats (Figure 37) were covered in deep mud throughout 1994. This phenomenon is reported locally as a permanent feature of that area and effectively precludes the use of the survey techniques applied during this assessment from a large part of the intertidal bay. The mud here also forms a barrier across the mid and upper parts of the intertidal area, thereby obstructing the most direct and quickest route back to the shore from the lower part of the Flats. The small bay to the west of Wick Rocks at Stolford also retained its covering of mud throughout the period of this assessment. There was a swathe of mud across the central and eastern parts of Gore Sand which effectively cut off much of the Gore from pedestrian access during the early part of 1994.

Tidal characteristics

The bathometric geometry of the Severn Estuary and Bristol Channel contribute towards both the range of the tide and to the very fast rate of the streams. The tidal characteristics of this area are exceptional. It should be noted that at Burnham-on-Sea tides between MLWS and LWS fall below CD.

	CD	(OD)
MHWS	10.9 m	(5.77 m)
MLWS	-0.2 m	(-5.33 m)

Mean spring range 11.1 m

MHWN	8.1	(2.97 m)
MLWN	2.1	(-3.03 m)

Mean neap range 6.0 m

Table 3. The mean tidal heights and range for Burnham-on-Sea

(Source: Chart 1152, Hydrographic Office 1986).

At Burnham-on-Sea CD is 5.13 m below OD, at Weston super Mare, 13 km up channel to the north, it is 6.0 m below OD while at Watchet, 23 km down channel to the west, it is 5.8 m below OD.

The highest predicted tide at Burnham-on-Sea during 1994 was 11.9 m above CD, the height of the tide above OD was therefore 6.77 m. The surface of the coastal clay belt of the Somerset Levels, where they fringe Bridgwater Bay, lies at 6 m OD; during 1994 there were 72 predicted tides that rose above that level. These figures do not account for the unpredictive effects of storm surges or barometric pressure, they are therefore approximate.

The tidal data used during this assessment were based on calculations for Burnham-on-Sea and came from three sources. For general, day to day predictions of high water heights and times, tables prepared by the Proudman Oceanographic Laboratory were used. Both low and high water heights and times were calculated from the Macmillan and Silk Cut Nautical Almanac using the Secondary Port data block for Burnham-on-Sea against the Standard Port of Avonmouth. Intermediate times and heights, between high and low water, were calculated by additional use of the tidal curve for Avonmouth.

The chart 'Watchet to Weston super Mare, Barry to Newport' (1152), 1:50,000 scale, published by the Hydrographic Office of the Admiralty, provided a guide to depths and drying heights though given the presence of often deep, mobile deposits in the bay these provided only a general reference.

Despite the extreme range and the very fast movement of the tide over the ground, the tidal characteristics in Bridgwater Bay are generally favourable for archaeological field assessment. The occurrence of LWS between 1100hrs and 1600hrs GMT allows the maximum exposure of the intertidal surface to occur during the middle of the day. It also means that the ebb can be followed out in daylight hours. The extreme range of the tides also produces a correspondingly larger vertical intertidal exposure.

During this assessment only predicted tides of above 10 m CD at Burnham-on-Sea were used for assessment of areas exposed in the mid to lower tidal range. Assessment of the upper foreshore can be undertaken on neap tides but it was generally found more convenient to undertake fieldwork in the blocks of seven to eight consecutive days when the springs were above 10 m CD and when low water occurs around mid-day. The request from English Nature (EN) not to enter Stert Flats at weekends, when the bird watching public use the hides on the warth, effectively reduced the fieldwork days in this area to blocks of five.

In the central and northern parts of the area CD generally lies some 4 km from the closest MHWS but the western end of the Gore lies some 7 km west of Burnham-on-Sea. These considerable horizontal distances when combined with a large tidal range result in a very rapid tidal movement. A measured transect across Stert Flats gave a slope of about 1 in 400 (STPG 1993). Between three and four hours into the flood of a 10.9 m tide (MHWS) the height of the tide will increase by 2.72 m within the hour making almost half a metre every ten minutes. In the intertidal channels the ebb runs faster than the flood.

The rate of increase in the height of the tide, and in consequence its speed over the ground, varies according to the time that has elapsed since LW. The tide rises quickest and therefore flows fastest during the third and fourth hours after LW when it will make about half of its range for the day. The other factor that affects the rate of the flood is the variable inclination of the intertidal surface. Where the surface is level, especially if this occurs in the mid tide range where the rate is greatest, the speed over the ground of the flood is very rapid. The effects of wind and barometric pressure can also affect the height and rate of the tide and are unpredictable.

Given these variables, when working in a new or unfamiliar part of the bay a large safety margin was allowed for the return journey. There are no hard and fast rules about timing the retreat from the intertidal area, much will depend on your position in the tidal range, the nature of the surface and the length of your safest route out of the area. Common sense, care and experience are the best aids. On the eastern end of Gore Sand (Figure 37), when working over 2 km out from the shore, the return was started one hour after LW. In this area the mud cover made walking slow and on the wet, reflective, level, featureless surface it was difficult, in calm weather, to see the approaching tide. Fieldwork in the area between 2 and 3 km west of Stert Island was initially also stopped an hour after LW. In this area, however, the concentration of archaeological sites meant that frequent visits were made allowing the team to become familiar with the more detailed behaviour of the flooding tide. This accumulation of experience for a particular area was found to be very important and similar levels of experience need to be

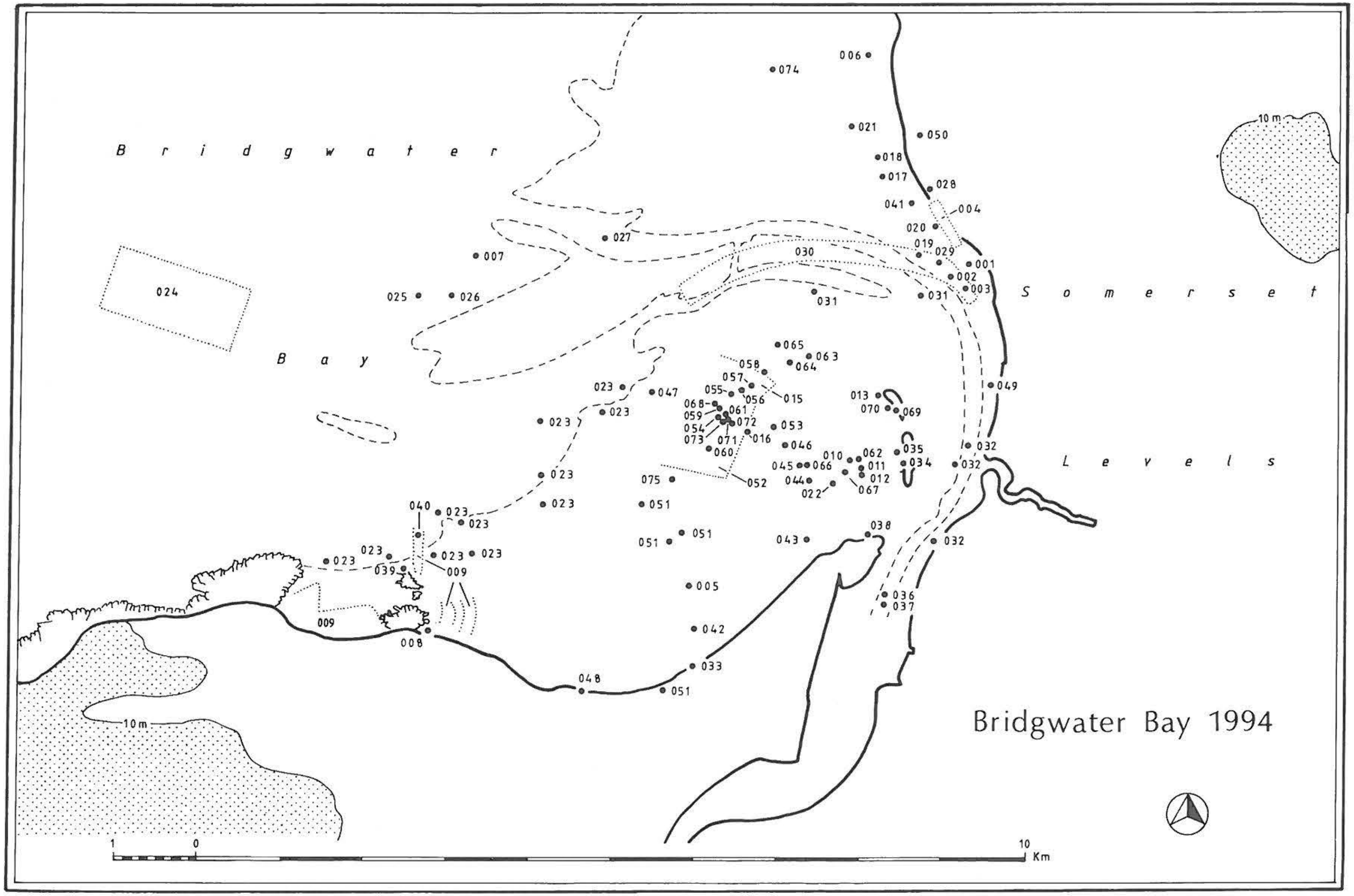

Figure 38. Bridgwater Bay: Location of archaeological and palaeoenvironmental sites and areas.

developed in other areas of the bay. It allows a far smaller safety margin to be applied so that more time can be spent in the field under less stressful conditions. When familiar with an area the state of the flood can be gauged in more detail from the disappearance of known and familiar features such as sand banks, fish weirs etc.

During the initial reconnaissance of a new area it was found useful to follow out the ebbing tide. This allowed the team to become familiar with the detailed topography and to note the varying speed and direction of the ebb. It is difficult to assess how level the surfaces are until you see them rapidly exposing as the tide falls.

Two km north-west of Steart the scoured surface of the Holocene alluvium appears to be particularly level and holds water in the shallow, linear depressions for most of the low water period. On this surface there are no margins for error, the tide is either 'out' or 'in' and 20 or 30 hectares can become suddenly inundated in a matter of minutes on a flooding tide.

The Gutterway that runs roughly westward from between Stert and Fenning islands is an intertidal channel that divides the northern from the central parts of Stert Flats, it is of variable depth and between 20 m and 300 m wide. It is necessary to cross this channel to access Stert Island and the area to the west, but there are only two places where this can be achieved. At the western end, 3.3 km west of the southern end of Burnham-on-Sea, it can be crossed within two or three hours of MLWS. At this point it is a fast running, shallow stream some 15-20 m wide draining the west end of the Gutterway towards the southern, intertidal channel of the River Parrett. This stream flows continually throughout the period of low water. At the eastern end of the Gutterway, 800 m west of Stert Island south, the channel dries approximately one hour before MLWS and floods again between one and two hours after MLWS. It is in this area that the remains of a linear, shingle feature, known locally as the causeway (010), crosses the channel.

It is important to note that in the eastern half of the Gutterway the flood initially flows from the east and then turns round to flow from the west; the ebb after initially flowing to the west then also changes and flows to the east. The early part of the flood runs very fast in this channel and it becomes impassable, on foot, within minutes of the tide reaching it. The difference could mean having to spend a high tide on Stert Island or radioing for a boat to take you off.

All times before and after LW given above refer to calm or moderate conditions. A strong westerly wind will hold back an ebbing tide but increase the rate of the flood so that it runs sooner than expected. On the level surfaces in the mid tide range this effect is exaggerated. It is reported that during archaeological work in advance of the Second Severn Crossing two hours could be subtracted from the predicted exposure of a site under strong south-westerly winds. Under these conditions tide tables were said to be useless (Godbold and Turner 1993). In Bridgwater Bay it is just as important to use the tide tables only a fair weather predictions.

The cultural resource

There were a total of 77 records raised as a result of this assessment and accordingly allocated primary record numbers. Their distribution and location is shown in Figure 38. The quantification of sites at this preliminary stage of assessment should be considered as an interim account. The number of records bears little relation to the number of sites and in this case it is a substantial, quantitative under-statement of the area's potential. In many cases fishing grounds were allocated a single primary record number when they contained perhaps a hundred individual fish weirs, while on other occasions an isolated weir, in an area where there were no other weirs, will also have been allocated its own primary record number. A similar issue is raised by the extent of sites. The area of peat deposits and submerged forest remains at Stolford were allocated a single primary record number but were exposed, during the period of this assessment, in four apparently separately zones within an area of 31 ha.

Records classified by functional context

A broad classification of the records can be made on the basis of the interpretation of a site's original working context. These comprise the maritime, intertidal, dryland and uncertain categories.

The largest group was for intertidal sites which accounted for 37 records or 48.05% of the total. Records in this group include sites or structures considered to have functioned in an intertidal context, such as fish weirs, sea walls, gunnery ranges, the causeway, the town jetty etc.

The dryland group accounted for 23 records (29.87%), including sites originally designed to function above HW but which are now exposed in an intertidal context as a result of a variety of factors such as sea level rise and geomorphological variation. These include ditches, a lithic site, buildings and enclosures, artefacts, aircraft wreckage and animal bone. This group also contains the palaeoenvironmental records relating to peat deposits and submerged forest remains.

The maritime group accounted for fifteen records (19.48%), including all items considered to have been designed to function at sea; wrecks, buoys, jetsam and items interpreted as ship's timbers.

The uncertain group contained two sites (2.60%); the stake and brushwood structure and a miscellaneous group of stakes.

This information is summarised in Table 4.

Table 4. Bridgwater Bay: records by functional context

	No.	% of 77
Intertidal	37	48.05
Dryland	23	29.87
Maritime	15	19.48
Uncertain	2	2.60
Totals	77	100.00

Summary account of the cultural resource

The records in this section are briefly described according to their typological classification. Given the limited chronological depth associated with records produced from preliminary assessments of this type, a descriptive text based on typology and function was considered to be more appropriate.

The distribution and location of the records is shown in Figure 38.

Fisheries

There were 28 records (36.36%) in this category and all but one (024) were related to intertidal fishing activities. The number of records is a substantial understatement of the true number and extent of the intertidal fishing sites. The types of evidence are summarised in Table 5.

Table 5. Summary of evidence for fishing

	No.	% of 28
Fishing grounds	4	14.29
Single weir	3	10.71
Rank of weirs	8	28.57
Rank of traps	2	7.14
Remains of putts	3	10.71
Stakes	2	7.14
Documentary	6	21.43
Totals	28	100.00

Fishing grounds

There were four records that dealt with

areas of fishing activity which at this preliminary level of assessment have been designated for convenience as fishing grounds.

The two grounds 015 and 052 were designated as such during the field assessment in order to accommodate the remains of probably over a hundred single, wooden weirs. These structures are built with two lines of poles, sunk vertically into the ground, forming a 'V' shape which, though usually forming a fairly acute angle, can range between 40° and 90°. The length of the wings very between 10 and 30 m. The open end always faces the ebb. Both areas also contain ranks of such weirs though these are ascribed individual primary record numbers and described below. The two areas are separated by the Gutterway stream and lie 3.3 km west of Burnham-on-Sea on the northern part of Stert Flats, south and south-by-east of Chisel Rocks. The division of these two contiguous areas by the stream is artificial and is a result of field assessment strategies.

The northern ground, 015, extended for some 26 ha. The north and north-eastern limit of the area was marked by a low shingle ridge, the eastern edge by the incidence of sites though unmarked topographically, the southern edge was artificially marked by the Gutterway stream while the western edge was less well defined and faded under a deepening deposit of mud. Some of the weirs in this area displayed evidence of repair and in one instance one of the wings had been built at least three times. The southern ground, 052, extended for some 25 ha. The northern limit was the Gutterway stream, the eastern limit was defined by the incidence of features, the southern edge by a low shingle ridge and the western edge by deepening deposits of mud. In both areas the surface, where not masked by mud, comprised the scoured surface of the Holocene deposits with a sparse scatter of shingle and occasionally mobile sand banks. All of the weirs point generally towards the west and would have functioned on the ebb.

The remaining two fishing grounds, 023 and 030, were both identified from nautical surveys. The fishing ground 023 was first recorded on a survey by Lieut. Denham RN in 1831 and again by Commdr. Alldridge RN in 1853. The evidence appears as a dispersed group of fourteen, comb-like symbols extending for 4.5 km between Hinkley Point and Chisel Rocks. Field assessment failed to locate any of these features near Hinkley Point or off Stolford but three substantial wooden structures were seen from a distance about 1 km south-west of Chisel Rocks. Deep mud prevented these sites from being approached but they appeared to be low walls of closely packed stakes. The remaining area, 030, was recorded on nautical surveys by Denham in 1831, by Alldridge in 1853 and by Staff Commdr. Archdeacon RN in 1885. The area is defined by a curving, linear group of 26 weirs that extend west of the Lower Lighthouse, for some 2.5 statute miles (4.02 km), around the northern edge of the Parrett. The weirs were marked by a variety of symbols including comb-line marks, dashed lines and dotted lines. The annotations were all similar and include: 'small weirs are scattered along this edge', 'small weirs along the steep edge of the mud flats' and 'fishing weirs along the steep edge of the mud'. On the 1853 survey and the OS 1:2500 of 1886 (Somerset Sheets XXV 9-10) the symbols do not appear to be schematic and there is the suggestion of metrical integrity. These features were charted as late as 1927 but none were located during this assessment. Transposing the position of these features onto the OS 1:10000 suggests that most will have been destroyed by the northerly migration of the intertidal course of the Parrett. The symbols used probably indicate that these features were ranks of weirs and not individual weirs.

Figure 39. Part of the large, wooden walled fish weir (045), facing north east and on the south side of the Gutterway. This arm of the weir was at least 200 m long.

Figure 40. Fish weir rank 055, facing north on Stert Flats 3 km west of Burnham-on-Sea.

Single weirs

The three single fish weirs that were individually ascribed primary record numbers may represent the same site recorded from different sources. The record 014 reports a wood and stone fish weir on Stert Flats (McDonnell 1993b) and was originally seen from a boat in the Gutterway. It seems likely that this site is the same as 045 recorded during this assessment. There are, however, substantial movements of deep sand in this area that could easily obscure another large weir. The record 022 was made from nautical surveys by Denham in 1831 and by Alldridge in 1853. On both surveys it is marked as a large, curving, comb-like symbol annotated 'weir' (1831) and 'fishing weir' (1853) and located 5 cables (926 m) west of the southern tip of Stert Island.

The weir 045 (Figure 39), recorded during this assessment, lies 500 m to the west-north-west of the position of 022 and is the only weir recorded in this area as a result of field assessment. It is constructed with thousands of tightly packed, vertically placed poles forming the remains of two, low walls approximately at right angles to each other. The east-west wall is at least 200 m long though part is obscured by a sand bank and the terminal is similarly obscured. The north by west-south by east wall is at least 255 m long but a section 129 m long in the middle is obscured by a shingle dome and the terminal is not clear. The poles or stakes are generally about 60 mm in diameter and some on the east-west wall are exposed up to 400 mm high. On the north by west-south by east wall there are two rows of packed stakes giving an overall width of 3 m to this wall which may have been replaced or repaired. At the interior of the apex there is a group of miscellaneous stakes, though there is no gap in the junction of the walls as there is in the similarly large weirs further west at Minehead and Porlock (McDonnell 1980). Other lines of posts within the arms of this weir may represent separate, non-contemporaneous structures.

Ranks of weirs

The remains of eight ranks of weirs were recorded of which seven were wooden structures and one a stone structure. The stone structure 039 lies on the rocks to the north of Stolford and comprises a north-south line of seven contiguous weirs forming a zig-zag pattern in plan. The wings are generally about 6 m long and have been formed by cutting slots into the surface of the rock (slates) and then standing stones on end and packing them with fragments of slate. No provision for posts were noted. These slots are about 300 mm wide and 150 mm deep. At the apexes on the west side the gaps are faced with short rectangular slots similarly packed and about 500 mm long by 300 mm wide and 150 mm deep.

The remaining seven, wooden ranks of weirs contain some of the best preserved structures associated with fishing that were recorded during this assessment. Two ranks 060 and 071 lay in the fishing ground designated 052, the remaining five lying in the fishing ground 015. All of the sites were oriented at approximately 015° (T) and lay within an area, of similar orientation, that is 1.4 km long by 0.4 km wide and located 3 km west of Burnham-on-Sea. The longest rank is 055 (Figure 40) at 230 m with 29 weirs; the shortest is 056 at 80 m with eight weirs but mud obscured much of this site and perhaps its true extent. The wings of the weirs in these ranks are much shorter than on the individual weirs and are generally only about 8-10 m long. At the apexes on the west side there are lines of stakes and poles extending westward for an additional 10 m or so giving an average total width to the ranks of about 20 m. The most substantial part of these structures is on the western sides