

1.0 Executive Summary

A rapid coastal zone assessment survey was conducted by Glasgow University Archaeological Research Division (GUARD) along three areas of the Firth of Clyde coastline. The sections included areas of Ayrshire, the Cowal Peninsula and the whole of Great Cumbrae Island (Figure 1). The desk-based assessment and walkover survey produced a total of 104 new sites and 195 known archaeological sites, of which 21 were Listed Buildings and 11 were Scheduled Ancient Monuments. The field survey was carried out by a team of two archaeologists from GUARD and two geomorphologists from the Coastal Research Group (CRG), Department of Geography and Topographic Science, University of Glasgow. A Public Outreach and Training Officer also helped train and guide newly established Shorewatch groups in the survey areas. The work was commissioned by the SCAPE Trust (Scottish Coastal Archaeology & Palaeo-Environment) and the Firth of Clyde Forum and was funded by Historic Scotland. The work was carried out in accordance with Historic Scotland's Procedure Paper 4: Coastal Zone Assessment Survey (Historic Scotland, 1996).

A wide variety of sites are located within eroding areas of the coastline. Of these sites a total of 20 were recommended for further survey. These sites included two fort/dun sites, several Medieval castles on the Ayrshire coast, a probable pre-Improvement settlement, sites related to the industrial past of Ayrshire, a previously unrecorded jetty/harbour on Great Cumbrae Isle and three post-Medieval sites on the Cowal Peninsula (Table 11).

The survey concluded that the Ayrshire coast is the worst affected by coastal erosion, especially the area between Troon and Portencross, while the Isle of Great Cumbrae proves to be the most stable.

2.0 Introduction

2.1 *Background*

This report is one of a series that have been produced by various archaeological contractors, funded by Historic Scotland, to characterise the state of coastal erosion and the threat it poses to archaeology in Scotland. This report presents the results of a rapid coastal zone assessment carried out between October and December 2002 of three areas within the Firth of Clyde.

2.2 *Survey Area*

The survey area comprised three sections of coastline in the Firth of Clyde (Figure 1). These sections included the entire coast of the Island of Great Cumbrae (18.5 km), the southern and eastern coasts of the Cowal Peninsula from Ardyne point to Strone Point (28.2 km) and a stretch of the Ayrshire coast from Largs to Maidens (77.5 km). This was a total distance of 124.2 km (based on 1:10,000 base maps viewed within ArcView GIS software package). The area around Hunterston Power Station and Ore Terminal, to the south of Fairlie, was not included in the survey area.

2.3 *Survey Conditions*

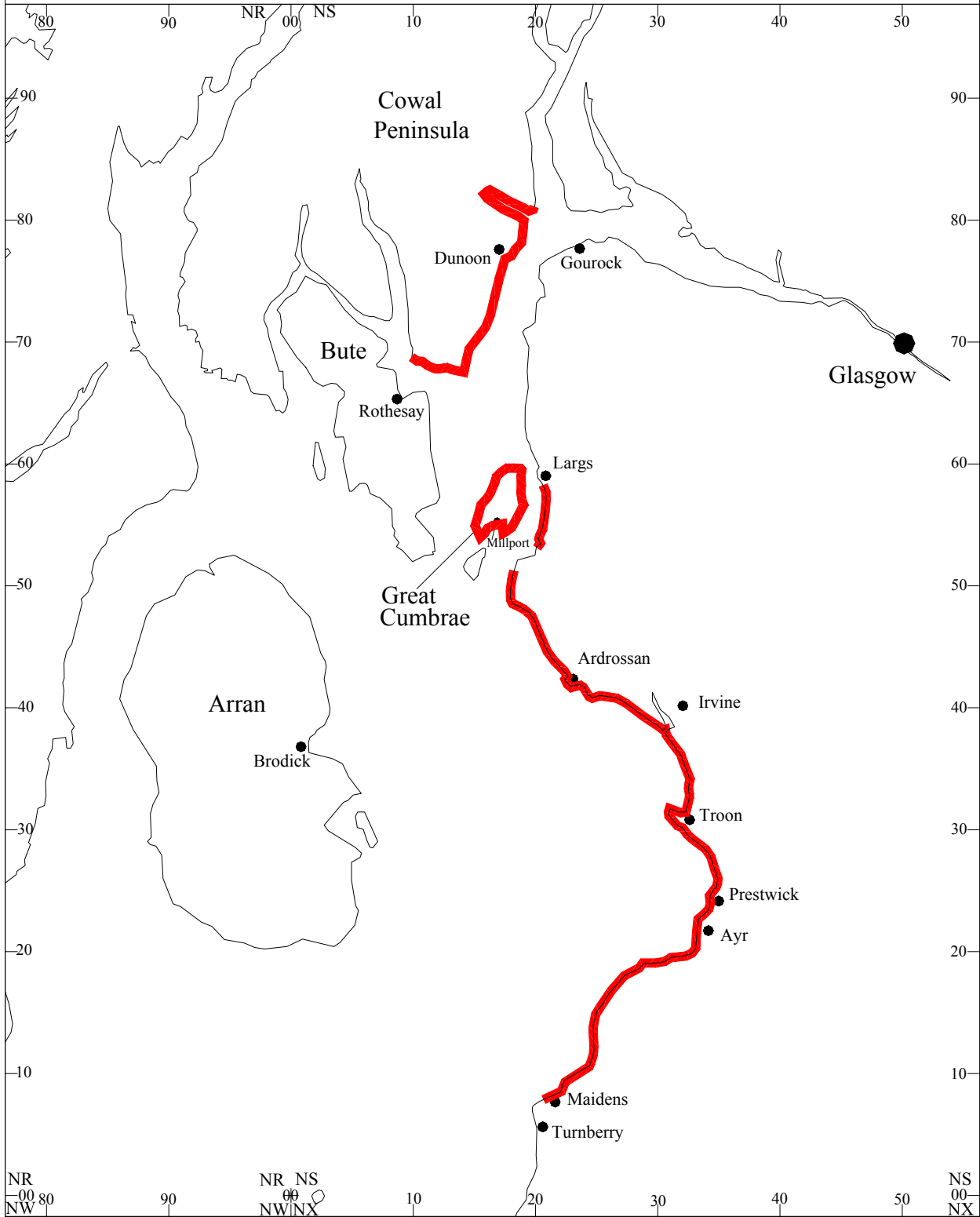
Carrying out the survey in the winter months was useful in that plant growth over the coastal areas was at a minimum. This increases the chance of identifying archaeological remains that may otherwise have been obscured by vegetation during the summer months. The effects of erosion are also more visible in winter because of the increased wind and wave action. However, the often adverse weather conditions, including heavy rain and wind, compounded by very short daylight hours, significantly slowed the field survey. Despite this, no full days were lost to bad weather.

3.0 Aims and Objectives

The main aims of the survey were:

- to increase knowledge of coastal archaeological sites and to identify those sites that are at risk, either presently or potentially, from erosional processes on the coastline, and
- to establish and train Shorewatch groups within the local community, to record archaeological sites and to monitor the effects of erosion in the longer term.

Figure 1 : Coastal Assessment Survey Area



The objectives were:

- to undertake a desk-based assessment that would identify all known archaeological sites within the intertidal zone and a landward strip of between 50 and 100 metres;
- to undertake a walkover survey in order to record the condition of the known archaeological sites and to record any new sites found;
- to undertake a geomorphological and erosional survey to inform the study about the rates of erosion and highlight any specific areas where erosion is particularly rapid, and
- to contact the local community in order to set up and train local Shorewatch groups.

4.0 Methodology

4.1 Introduction

The methodology was based on that set out in Historic Scotland's Procedure Paper 4: *Coastal Zone Assessment Survey* (Historic Scotland, 1996) and discussions in *Archaeology and the Coastal Erosional Zone: Towards a Historic Scotland Policy* (Ashmore, 1994).

4.2 Coastal Zones

The survey area consisted of two specific zones: the intertidal zone (defined by the area between Mean High Water Springs, *MHWS*, and Mean Low Water Springs, *MLWS*), the coastal edge (from the *MHWS* to a few metres inland) and a landward strip varying in width between 50 m and 100 m from the coast edge. The desk based assessment included all of the above areas. Field survey of the intertidal zone was undertaken only where access and the state of the tide allowed. High tides occasionally prevented access to a few small bays and inlets in the area between Culzean Bay and the Heads of Ayr. These were surveyed instead from a higher viewpoint. In urban areas the field survey was restricted to the coastal edge and intertidal zone; in particular, access could not be gained to parts of Ayr Harbour and Ardrossan Harbour because of commercial and industrial properties.

4.3 Desk Based Assessment

GIS data were provided by The West of Scotland Archaeology Service (WoSAS). This consisted of a Microsoft Access database of the relevant sites within the survey areas extracted from the local Sites and Monuments Record (SMR). The map base was also provided by WoSAS in ArcView and consisted of the 1:10,000 OS maps, 1:50,000 OS maps and the first edition OS maps (fitted to the National Grid). This greatly aided the production of the maps and data included in this report.

The desk-based assessment involved a thorough search of documentary and cartographic sources listed below (Sections 13.0, 14.1 and 14.2 for full list).

- Examination of documentary sources held in various libraries, including Glasgow University Library, the National Library of Scotland and local libraries within the survey area.
- A search of the National Monuments Record of Scotland (NMRS) held at the Royal Commission on the Ancient and Historical Monuments of Scotland (RCAHMS), Edinburgh, which contains information on all known archaeological sites in Scotland.
- An examination of the available documentary and cartographic sources regarding processes of erosion and coastal geology/geomorphology. This allowed identification of areas where processes of erosion were most likely to be adversely affecting archaeologically sensitive areas.
- An examination of available cartographic sources held at the National Map Library Scotland (NMLS) in Edinburgh, including the first and second edition 1:10,560 scale OS maps and a variety of historic maps from the seventeenth and eighteenth centuries.
- An examination of available aerial photographs held at the RCAHMS.

4.4 *Field Survey: Archaeology and Built Heritage*

The field survey was undertaken by two archaeologists. Due to health and safety issues the team always remained as a single unit and did not split up between the coastal zones. To allow maximum coverage of the coastal zone this generally meant surveying the coast edge and intertidal zone in transects on the outward journey and then surveying the hinterland 50 m – 100 m strip on the return leg. As mentioned above, very small areas of the coast edge and intertidal zones could not be accessed. Where feasible these areas were surveyed from a distance. While the marine zone was not part of this project, if a marine feature was noted from either the desk-based assessment or the field survey its location was recorded.

While individual sites were numbered separately, groups of closely located, interrelated sites were numbered together as a complex.

A large portion of the survey area was classified as urban where assessment in the field was confined to the inter tidal zone, coast edge and buildings immediately abutting the coast edge.

Each archaeological site was allocated a unique number in the field to be used as its identification in the text, photographs and maps. Each known site visited or new site located during the field survey was recorded by written description on survey sheets designed specifically for this project (Section 15.5 and 15.6). They were also recorded by sketch, including dimensions and locational data where appropriate. All sites were photographed on black and white print and colour slide. The location of each site was established using a hand held Garmin Global Positioning Satellite (GPS) instrument. This gave a ten-figure grid reference, which is presented in this report. It is important to note that only the eight figure grid reference can be taken to be accurate. The location of the sites was also marked on hard copies of the Ordnance Survey 1:10,000 edition maps. Written notes and photographs were also kept on the erosional status of the coastline, the geomorphology and geology of the coast and the general landscape character of the coast in areas not covered in detail by the geomorphologists.

The dates of sites referred to in this report were derived from the WoSAS SMR and the NMRS. The dates assigned to new sites were derived from their material composition, visible appearance in the field and from documentary sources. As no intrusive or destructive work was carried out during the survey, many of the sites could not be accurately dated (Section 5.1.2).

The recommendations for action for each site were ‘survey’, ‘monitor’ or ‘nil’. These were proposed as a guide to future action that may be taken to help preserve the cultural heritage of the survey area. Issues that influenced the recommendation category assigned to each site included the significance of the site and the rate of coastal erosion (Section 5.1.4).

4.5 *Geology/Geomorphology and Erosion Class Survey*

A comprehensive review of the available documentary and cartographic sources regarding the coastal geology/geomorphology and erosional aspects of the coast was undertaken by geomorphologist Alistair Rennie, assisted by Dr Jim Hansom, of the CRG. This enabled the geomorphologist to highlight areas to the archaeological team where the rate of erosion was likely to be high and also enable the archaeologists to identify archaeological sites that required further attention by the geomorphological team. These areas were then targeted for detailed field inspection by the geomorphologists. This involved detailed field notes and digital photographs on coastal processes in specific areas of the coastline. The maps of the hinterland geology, coastal geomorphology and erosion class for the areas of the Cowal Peninsula and the central and southern sections of the Ayrshire coast were prepared from notes taken by the geomorphologist. A broad field survey of the remaining coastline was also undertaken by the geomorphologists and the maps were prepared after consultation with the geomorphologist.

4.5.1 *Extension of the Classification*

The classification of the coastline by Historic Scotland (1996) has been used in this report for consistency and continuity. However, the classification includes little reference to rates of erosion and to the time periods over which shoreline erosion has occurred. We have addressed this by classifying the status of the shoreline for long-term and short-term effects (supplemented by an erosion rate indicator) and embedded this within the Historic Scotland Classification. An example would Culzean cliffs, which are by definition an erosional feature. However, the rate of erosion is very low, so low that in the short term they may be regarded as stable. Thus a hard rock cliff coast with minimal short-term erosion is classified as: Long term – Erosional, Short term – Stable to Erosional, Low rate of change. The table below shows the range of possibilities. Long term is taken to mean in excess of a few hundred years, short term is taken to mean less than two years.

Table 1: Extension to the Classification

<i>Time Frame</i>	<i>Status</i>	<i>Rate of Change</i>
Long Term	Accretional Stable Erosional	Low Medium High
Short Term	Accretional Stable Erosional	Low Medium High

This extension of the classification thus gives information on the current status of the shoreline, but sets this into a timeframe beyond the current. Any additional information about erosion is contained within the documentary section.

Classification of the coastal status on the day is highly subjective and depends on recent wave and sediment conditions. This is acknowledged and exemplified in the SNH report on the Firth of Clyde (Firth & Collins 2002).

4.6 *Public Outreach and Training of Shorewatch Groups*

Contact was established with several local history and archaeology groups as well as interested individuals within the survey areas. Three Shorewatch groups are now in existence, covering north and south Ayrshire and Great Cumbrae, and the Cowal Archaeological and Historical Society have taken responsibility for Shorewatch along the Cowal Peninsula section. Along the Ayrshire section it quickly became apparent that the number of participants was too large to allow the whole group to be trained together. To resolve this, the groups were subdivided into smaller parties of four to five individuals to allow for more contact with the training officer, with the understanding that these people would train the others. A day was spent with each group walking areas of the coastline, providing information on the type of archaeological site and geomorphological conditions the Shorewatch groups were likely to encounter, and how to monitor, record and survey those sites.

In liaison with SCAPE and the Firth of Clyde Forum, a new set of recording and monitoring forms was developed (Section 15.6), along with a detailed information pack explaining how to use the forms and also providing information on basic recording, survey techniques and geomorphology. The recording forms were remodelled in order to ensure greater consistency and compatibility with GUARD's Coastal Zone Assessment recording form. This additional information was intended to supplement the Shorewatch Packs rather than replace them.

A follow up period of liaison will also take place in spring of 2003 to provide some support for the groups in their early stages.

5.0 Report Format

The format of the report follows the guidelines set out in Historic Scotland's Procedure Paper 4: Coastal Zone Assessment Survey (Historic Scotland, 1996), with some minor variations. These do not affect the overall presentation of the main components of the report and are sufficiently consistent with Historic Scotland's guidelines to allow comparisons with previous and future coastal zone assessments.

The entire survey area is divided into 13 consecutive stretches of coastline. Each of these area is represented by three associated map sections and related gazetteers. These are: 1. Built Heritage and Archaeology 2. Hinterland Geology and Coastal Geomorphology and 3. Erosion Class.

The following section explains the layout and terminology used throughout the report.

5.1 *Built Heritage and Archaeology*

The gazetteer entries accompanying the Built Heritage and Archaeology maps are set out as follows. Grid references are given as ten figures. As stated in Section 4.4, the accuracy of the GPS results in only the eight figure grid reference being accurate. In some cases, where the site was previously recorded and not relocated with the GPS during the survey, the grid reference given may contain two to three zeros. This is due to the previously recorded reference only being four or six figures. For example, a reference originating as NS 17 82 will appear as NS 17000 82000 in this report.

<i>Description</i>	<i>Gazetteer Example</i>	
<i>Site number(shown on Map)</i>	Site No	C40
<i>National Grid Reference</i>	Grid Ref	NS 17487 81214
<i>Site Name</i>	Site Name	Grahams Point
<i>Summary Description/ Site type (below)</i>	Site Type	Monument
<i>Period/ Date (below)</i>	Date	20 th cent
<i>Condition (below)</i>	Condition	Good
<i>Recommendation (below)</i>	Recommendation	Nil

The site description entries (Section 12.0) relating to the Built Heritage and Archaeology are set out as follows. NMRS Number relates to the number assigned to previously noted sites in the National Monuments Record of Scotland held at the Royal Commission on the Ancient and Historical Monuments of Scotland (RCAHMS). WoSAS Number relates to the number assigned to previously noted sites in the Sites and Monuments Record held by West of Scotland Archaeology Service. Where these numbers do not appear this indicates the site was *not* present in these monument records.

<i>Description</i>	<i>Site Description Example</i>	
<i>Site number(shown on Map)</i>	Site No	C21
<i>National Grid Reference</i>	Grid Ref	NS 18315 58883
<i>Site Name</i>	Site Name	Lady's Grave
<i>NMRS Number</i>	NMRS No	NS15NE 2
<i>WoSAS Number</i>	WoSAS No	5201
<i>Period/ Date (below)</i>	Date	Unknown
<i>Site Description</i>		The southern cairn, or 'Lady's Grave'.....

5.1.1 *Summary Descriptions/ Site Type*

No distinct categories were assigned when defining the site type. The purpose of the survey was not to provide in depth investigation into specific sites. When characteristics of a site were clear or previously known, a definition of the site type was given, for example 'Pier'. Where sites were more difficult to characterise, a more general site type was assigned, for example 'Maritime marker' or 'structure'. In some instances, where the site type is suggested rather than definite, the label is suffixed by 'possible'. In essence, the site type category is a very short abbreviation of what appears in the more detailed site descriptions (Section 12.0). The more clearly defined the description and detail present in the site descriptions, the more accurate a representation of the site can be stated in the site type in the gazetteers.

5.1.2 *Period/ Date*

The rapid nature of this coastal zone assessment results in some difficulty in accurately dating sites. This is due to the emphasis on identifying sites rather than providing a detailed archaeological account. For this reason the date ranges were kept relatively wide to provide an indication of the age of the site rather than a specific date. These date ranges were as follows.

- 20th century
- 18th to 20th century AD
- 14th to 18th century AD
- 6th to 14th century AD
- 1st to 6th century AD
- 4th millennium BC to 1st century
- Pre 4th millennium BC
- Sites of Unknown date

The new sites located during the survey were dated on appearance and any evidence provided by the desk based assessment. The information provided by the desk based assessment proved more relevant to sites of post eighteenth century. It should be noted that within the boundaries of this survey, with regards to the lack of investigative archaeological work, assigning a date range to a site can be very subjective. Many of the sites categorised as eighteenth to twentieth century may prove to be older but showed no sign of this during the survey. Sites where the date range could not be narrowed down to one of the above were categorised as of unknown date. Any date assigned to these sites would have been entirely speculative.

5.1.3 *Condition*

Sites located during the survey were assigned a condition based on their apparent state of preservation. The categories were as follows.

<i>Good</i>	This category related to sites where the majority or all of the site was present and visible. In general this applied to upstanding remains that showed clear characteristics allowing assignment to a date range and whose structure showed little or no sign of deterioration.
<i>Fair</i>	This category related to sites where remains existed to an extent that some form of interpretation was possible in relation to site type or age. In general, these sites were partially deteriorated but still contained upstanding remains and showed no signs of imminently decreasing in state of preservation.
<i>Poor</i>	This category related to sites where visible remains were in a heavily deteriorated state. This resulted in little or no potential for characterisation or interpretation unless stated in previous recordings.
<i>Unknown</i>	This category related to sites that were either not investigated during the field survey or were noted during the desk based assessment but were not located during the field survey.

5.1.4 *Recommendations*

The recommendations given for each site relate to suggested further work. The degree of work suggested was based on the significance of the site, its state of preservation and the potential risk to the site from erosional processes on the coastline. Recommendations fell under the following criteria.

<i>Survey</i>	Where survey is recommended, this generally indicates that a site is located where the rate of coastal erosion is high and the site holds some archaeological or historical significance. In some cases the survey work may range from topographic, standing building or geophysical survey to consolidation and public awareness work. Trial trenching may also be an appropriate means of assessing more ambiguous sites. In many cases, particularly the castle sites and related features, a more frequent and detailed monitoring/consolidation programme is suggested by the survey rather than periodic monitoring.
<i>Monitor</i>	Where monitoring is recommended, it is intended to draw attention to less significant sites that are located in an area where the rate of coastal erosion is high, or when significant sites that are under no immediate danger from coastal processes may, in the long term, come under some threat. It is hoped that the Shorewatch groups will form an integral part of monitoring the coast of the survey area over the long term.
<i>Nil</i>	Where no action is recommended, then no further work at the current time is required. This will include single find spots, sites that have already been destroyed, or sites that are located on a sufficiently stable part of the coast to merit little or no more attention for the time being.

5.2 *Erosion Class*

The erosion class gazetteers vary slightly from that stated in Historic Scotland's Procedure Paper 4: *Coastal Zone Assessment Survey* (Historic Scotland, 1996). It was deemed necessary to set out Long Term and Short Term erosional status of the shoreline (Section 4.5.1). It is important to emphasise that the erosional status at the time of survey and, therefore, the erosional status that is shown on the relevant map is the Short Term erosional category. The Long Term erosional status does not relate to the associated map. The gazetteer entries accompanying the erosion class maps are set out as follows.

<i>Description</i>	<i>Gazetteer Example</i>
<i>Coast Unit Number/Name</i>	1 Strone Point
<i>National Grid Reference</i>	NS 1911 8043
<i>Coast length of unit</i>	0.81 km
<i>Long term erosion class</i>	LT: Erosional - Low
<i>Long term erosion class</i>	ST: Stable - Low
<i>Description of coastal unit</i>	The littoral coverage was of <10%.....

5.3 Hinterland Geology and Coastal Geomorphology

The gazetteer entries accompanying the Hinterland Geology and Coastal Geomorphology maps are set out as follows:

<i>Description</i>	<i>Gazetteer Example</i>
<i>Coast Unit Number/Name</i>	1 Strone Point
<i>National Grid Reference</i>	NS 1911 8043
<i>Coast length of unit</i>	0.81 km
<i>Foreshore type</i>	Mainly rock platform
<i>Coast edge type</i>	Sea Wall
<i>Hinterland type</i>	Raised Beach
<i>Description of coastal unit</i>	The rock headland at Strone.....

6.0 Background to the Archaeology of the Survey Area

The three areas within the survey zone have had varying degrees of archaeological investigation carried out within them prior to the survey. A brief overview of this is given below.

6.1 Cowal Peninsula

The first major archaeological survey was included in the production of the first edition OS maps in the late 1860's. This noted sites of archaeological and historical interest and there have been follow up visits from Ordnance Survey throughout the twentieth century. The Royal Commission on the Ancient and Historical Monuments of Scotland (RCAHMS) produced an inventory of sites ranging from the prehistoric to Medieval and later sites, which was published in two volumes in 1988 and 1992. Follow up visits by the RCAHMS have also been undertaken. While the Cowal Archaeological and Historical Society have been active in this area (Rennie, 1993 & 1997), recorded excavations in the survey zone on the Cowal Peninsula are few. In May 1994 rescue excavations were undertaken by J Atkinson (GUARD) on five graves at Chapelhall, Innellan. Previous reports from the area in the mid nineteenth century noted remains of a chapel and burial ground in the area.

6.2 Great Cumbrae

Little recorded work appears to have taken place on the Island of Great Cumbrae. Most of the records relate to work carried out in the late nineteenth century (Chardenal 1883), and the production of the first edition OS maps in the late 1860's included notes on archaeological and historical sites. The former tumulus GC20 at the northern end of the island was investigated in 1879 and 1881. The vast majority was removed later during the construction of the road. Just to the south of this another cairn (GC21) was partially excavated in 1878. There are also records of a tumulus at the northern end of the island (GC32) that was destroyed in 1873 during the construction of the road (MacGowan 1883).

6.3 Ayrshire

The Ayrshire coastline has been subject to a variety of archaeological and historical surveys. These include the production of the first edition OS maps in the late 1850's, which included notes on archaeological and historical sites, and a publication on sites relating to prehistory (Smith 1895). More recent surveys include an inventory of sites in the southern area of the survey zone by the RCAHMS in 1983 and a coastal survey from Culzean to Dunure (Addyman 1998) in advance of a woodland regeneration scheme. E M Patterson produced an article on a survey of possible ancient fish traps in 1989 which covered the area from Ardrossan to Hunterston. Due to the heavily built up nature of the coastline north of Doonfoot, it would be expected that much of the pre twentieth century archaeological remains are destroyed, resulting in a lack of documented excavations in this area.