Coastal Assessment Survey
Solway North Coast

September and October 1996

Volume 1 of 3: Introductory material, and the
western part of the coast:

Carrickcarlin Point to Crook of Baldoon

Map sets 1 to 19

A Report for HISTORIC SCOTLAND

by the CENTRE *for* FIELD ARCHAEOLOGY

THE UNIVERSITY OF EDINBURGH

CENTRE *for* FIELD ARCHAEOLOGY

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1 INTRODUCTION

Background

In June 1996 Historic Scotland invited tenders to conduct the first phase of a coastal survey project to cover the Scottish part of the Solway Firth from the Mull of Galloway (NX 160 306) eastward to the bridging point of the River Sark (NY 327 669). Following submission of its Project Design, the Centre for Field Archaeology was awarded this project.

This project is part of a larger Historic Scotland review of archaeological resources in relation to the coastal zone and is the fourth such survey to be completed. Surveys have already examined: the north coast of the Forth estuary (Robertson 1996); the south coast of the Forth estuary (James 1996); and a stretch of coast from Ullapool to Lochinver in Wester Ross (Long 1996). This programme of work has emerged from the recognition of the importance of the coastal zone to Scottish archaeology and the need for information to allow Historic Scotland to determine the nature of the threats to coastal areas and to determine what the best solution is for specific sites (Ashmore 1994). Of particular relevance here was the recognition by Ashmore of the need to obtain better targeted standard information for coastal areas. As a consequence, all of the recent surveys have followed a similar methodology, based on Historic Scotland's *Archaeology Procedure Paper 4, Coastal Zone Survey* (1996).

In addition to the archaeological dimension, this survey has been conducted against a wider background of interest in the management of the Solway Firth. The *Solway Firth Review*, published in 1996 by the Solway Firth Partnership, presents a review of available information and is designed to provide a reference point for the development of a management strategy for the Solway Firth Partnership Area. Our survey encompasses only a part of this area, which also extends along the south shore of the Firth. The *Review* considers, amongst other topics, landscape and cultural heritage, geology and geomorphology, marine and coastal environments, ecology, social and economic resources, recreation and tourism, harbours and shipping as well as coastal protection, planning and management. Archaeology, and the preservation of archaeological sites, clearly cross-cut a number of these subjects, and the present Report represents a contribution to the debate leading to the development of a management strategy for the area.

The Department of Archaeology at Edinburgh University and the Centre for Field Archaeology have a long term interest in the archaeology of the coastal zone, perhaps best expressed in recent years in work in the Outer Hebrides, such as on the Valtos peninsula on Lewis, or at Bosta Beach on Great Bernera, and in the study of intertidal crannogs being undertaken by Alex Hale. In addition the Centre has already been involved in applied research along the north side of the Solway, having conducted extensive survey along the coast near Annan on behalf of British Nuclear Fuels plc and further west at the landfall of the Irish Gas Southwest Gas Interconnector pipeline. This project therefore represented an opportunity to combine the research interests of a number of members of staff and to provide the baseline for supplementary research over the next few years.

The fieldwork reported here was conducted by Kirsty Cameron, Dr Mike Cressey, Lisa Marlow, Dr Malcolm Murray, Ronan Toolis, Alex Hale, Matt Ritchie, and Jon Bendicks. Desk-based work and report production was chiefly conducted by Mike Cressey and Ronan Toolis, with illustrations being prepared by Kevin Hicks, George Mudie and Kirsty Cameron. Drs Geraint Coles and Ian Ralston provided assistance with the interpretation of geomorphological and archaeological data. Dr Bill Finlayson managed the project for CFA and Patrick Ashmore for Historic Scotland.

Project Aims

The objectives for the 1996 survey were set out in the Historic Scotland Project Outline as:

1) *To understand how best to assess the built heritage of the Solway over the next few years within the resources available, and in such a way as to encourage future research projects and local monitoring and fieldwork.*
2) *To prepare factual information on and an inventory of part of the coastal heritage to provide a basis for more work including:*
    - *detailed survey of important areas prior to protection, excavation or abandonment;*
    - *monitoring of sites and stretches of coastline by local organisations and people.*

In addition to agreeing to follow the Historic Scotland *Procedure Paper* to fulfil these objectives, CFA has undertaken to undertake certain additional elements of work to further the long term objectives of the project, including establishing local contacts with a view to promote long term monitoring of the shore and to conduct additional aerial photographic survey.

Report Format

This Report contains the results of the project. These are presented sequentially for each portion / cell of the coastline and follow a standard format. Elements included are an introductory section, a section describing the methodology employed, a section containing the geomorphological, coastal erosion and archaeological data and maps. Pertinent issues are highlighted through a number of case studies, which are followed by a section analysing the results and making various recommendations, and a list of references.

The Study Area

Introduction

The Scottish part of the Solway Firth included within the study area defined for this project comprises a wide variety of coastal forms, including hard steep shorelinesas well as a variety of areas in which depositional characteristics predominate. These latter comprise sand dunes, intertidal mudflats, estuarine and lagoonal complexes and saltwater marshes. The total length of coast in Dumfries and Galloway is estimated at 447km (Ritchie and Mather 1984), and the Solway Coast study area therefore comprises a significant proportion of this. Within this coastal strip, there are an estimated 35.4km of

beach formations. The total area of sand in Dumfries and Galloway, including beaches, dunes and links is 2,368ha, representing 4.7% of the Scottish total, but, at least in 1984, there were no beaches with high perceived erosion damage. 78% of the beaches have raised beaches near the coast, representing an important resource for early prehistory in the area. The presence of raised beaches and palaeochannels has resulted in this coastline having an extremely varied cultural heritage, ranging in date from the numerous Mesolithic sites identified (principally by W.F.Cormack) onwards to include features of industrial archaeological interest, such as the site of the former rail bridge over the Solway at Annan.

Known archaeological sites therefore range from "hard" upstanding structures to "soft" structures, marked by much flimsier and sometimes wholly organic remains such as the remains of former fishing systems and on to what currently appear to be largely structure free, and on occasion structureless sites, such as Mesolithic and Neolithic flint and chert scatters. Known cultural heritage sites occur on sectors of "hard" rocky coastline, as well as in "soft" areas, where sands, silts and clays constitute the geomorphological formations represented. The combination of differing geomorphological and archaeological site characteristics makes for a particularly rich and complex study area. The intricacies of marine transgressions and regressions, and the presence of raised beaches make the environment both complex and rewarding to study.

Extent and Dimensions

CFA initially proposed to conduct a rapid scan desk-based survey for both archaeological and geomorphological aspects of the survey for the full 320km length of coast and to determine, based on the results of this rapid scan, how much of the full 320km strip could be completed in detail during the subsequent desk-based and field stages. In the event, and partly as the result of relatively few previously unknown sites being located during the investigations, we were able to complete the full 320km distance for all stages of the project.

The Tidal Environment of the Solway Firth

The Solway Firth is influenced by the Atlantic Ocean and the physical features of the sea, climate and tidal regimes all contribute to the many varied shoreline features identified along the Solway Firth. The Solway Firth is an area of high tidal energy and this has a major bearing on the transportation of sea-bed sediment. The relative strength and duration of the tidal ebb and flood velocities tend to produce a resultant upstream transport vector which is augmented by wave induced currents. This strongly tidal environment has a bearing on shipping and, combined with the shallow nature of much of the Firth is a controlling factor as to why there are no major commercial developments at the head of the Firth (Solway Firth Review, 3 and 41).

The climate is relatively mild and certain parts of the Firth can at times be sheltered against the actions of wind and waves, although winds can change suddenly and expose sheltered coasts to wave erosion. The Galloway promontory affords shelter to areas in its lee from the severity of south-westerly gales. The height and direction of waves are governed by the dominant wind direction at any one time.

Figure 1 demonstrates the principal movement of residual currents and the general trend of sediment transportation. Much of the work concerning sediment transportation in the Solway Firth has been established from study of radioisotopes originating from Sellafield (more particularly Cs^{137}) and the distribution of sea-bed and surface markers and sea-borne domestic waste.

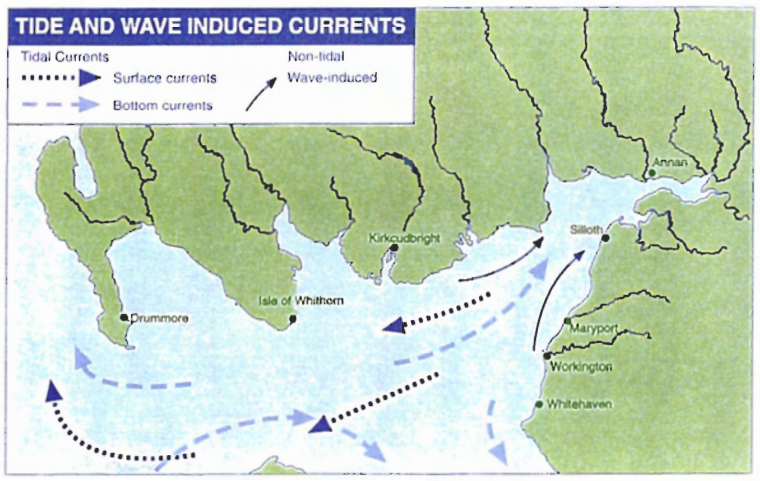


Figure 1 Tidal Currents (after Solway Firth Review 1996, 46)

Previous Archaeological Research

There has been a considerable amount of previous archaeological research in the area, and the desire to protect the archaeological resource is witnessed by the number of Scheduled Ancient Monuments along the coastal strip. Much of this research has, in recent decades, been prompted by coastal erosion, for example the work of Gordon Ewart at Cruggleton Castle (Ewart, 1985), or of Trevor Cowie in the Luce Sands. The information held in the Transactions of the Dumfries and Galloway Natural History and Antiquarian Society represents an invaluable resource. It is relatively unusual in Scotland to have a local society which has such a long and constant record of archaeological research and active local researchers such as Cormack have made a substantial contribution to our knowledge of this shore zone. The combined natural history and archaeological interests of the Society are of course particularly relevant to the needs of the current project. Restricted sectors of the coastal zone were examined as part of RCAHMS rapid assessment programme in the first half of the 1980s (RCAHMS 1991, 1985).

There has been a considerable amount of archaeological flying conducted in the eastern part of the survey area. Much of this has been undertaken in the late 1970s by Professor Barri Jones of Manchester University and has focused particularly on the Roman period remains at the east end of the study area (e.g. Jones, 1979, with map between pp. 40 and 41). Little systematic archaeological research has been conducted on cetrain landscape facets that have proved fruitful elsewhere, such as the extensive mudflats of the eastern part of the estuary.

There have been a number of geomorphological studies made along the Solway Coast, including work by Jardine and Morrison (1976). Recently research has been conducted by Andy Haggart of London Guildhall University. Dr Richard Tipping of Stirling University is currently working at Picts' Knowe, and in part his work is reassessing Jardine's research. Dr Tipping's research area does not lie within the current coastal margin but, since it has a marine component, this serves as a reminder of how considerable coastal change has been over the last few thousand years

Acknowledgements

We would like to express our thanks to all those who assisted us in this project. In particular we would like to mention Tony Woods of HM Coastguard Service Kirkcudbright and Wally Wright, the SNH warden at Caerlaverock.

2 METHODOLOGY

Within the framework furnished by *Historic Scotland Procedure Paper 4*, CFA proposed a four phase approach: rapid scan survey, full desk-based survey, field survey, and reporting.

Phase 1

CFA conducted a rapid scan desk-based survey for both archaeological and geomorphological aspects of the survey for the full 320km length. Based on the results obtained, senior staff then assessed whether the full 320km strip could be completed within available resources at the desk-based level. CFA had guaranteed to complete a minimum 250km strip at the full desk-based level, but had proposed to extend this if possible, as it was appreciated that the fundamental purpose of the study is to provide an initial suite of information covering as large an area as practical, which can then be examined in more detail as appropriate in subsequent stages.

During the course of the rapid scan, CFA made initial contact with the relevant bodies listed in the Historic Scotland Procedure and Project Outline.

Phase 2

CFA then carried out a full desk-based study, in accordance with Historic Scotland procedures. This research identified a series of zones characterised respectively by accretion, stability, or recession, which were subsequently ground truthed to verify the preliminary conclusions on their characteristics derived from the desk-based study. Ground truthing was conducted on the basis of visits to sample locations, rather than by the examination of continuous lengths of coastline. An important aspect of this work was to assess the reliability of available geological mapping in the area.

CFA concurred with the Historic Scotland Project Outline in considering that aerial photographic imagery would be of particular importance to the survey, especially in the study of intertidal mud and silt flats. This view was partially an outcome of safety considerations. Examination of accessible aerial photography was also important to ensure good spatial coverage within the constraints of available resources. In addition, however, we consider that the aerial photographic imagery is probably the best available source of information for these areas below High Water Mark. Previous surveys of intertidal zones have shown that aerial photographic imagery is often the only source which reveals the patterns of large scale features.

There are several relevant series of photographs, including runs from the immediately post War period, and surveys undertaken in the 1960s and 70s and obtained for land use capability assessments. These provide closely-dated series of images that can be used for comparative purposes over a considerable period:, when combined with ground inspection, they can provide sequential evidence for almost 50 years of change. Although the Historic Scotland procedure documentation notes that the examination of several series of photographs and map sources can be expensive, CFA considers that, especially given the importance we attach to aerial photographic analysis for the intertidal zone, the time spent on aerial photographic analysis and other documentary sources , in this context,

repaid the investment. In addition, it can be difficult in the field to determine whether a given stretch of coast is accreting, stable, or eroding, or indeed oscillating through time and the aerial photographic evidence furnishes comparative data which makes this assessment more secure.

In addition to the existing aerial photographic collections, CFA considered that new aerial photography should be obtained. We note that the Historic Scotland Procedure advises against setting out to acquire new aerial imagery, except in certain conditions.t CFA however considered that, against the background of the known tidal regime of the Solway, the use of oblique aerial photography may permit the most economical and effective way of examining the intertidal zone specifically for archaeological purposes, in addition to the benefits to safety of avoiding walkover survey in what can be a treacherous area. CFA considered it unlikely that the existing coverage would provide a systematic record of the intertidal zone, which has been borne out by our examination of the available cover. Aerial photography accessible to CFA staff, thus, whilst providing valuable information for the coastal erosion aspect of the study, is far from furnishing a comprehensive set of images, achieved in suitable lighting and tidal conditions, for either the known archaeological resources located on the coastal edge or for potential examples located below the high water mark .

What is still required is an initial assay, if justified followed by systematic effort, to record the intertidal zone at low tide, with low sun, to gain the maximum definition of what may be relatively small-scale or fugitive traces, suitably highlighted by oblique lighting conditions. Given the assumed absence of substantial colour differences to enable feature identification against natural silts (as noted in the Project Outline) and the probability that many features will be eroding almost to the level of the surrounding deposits and will therefore only have low relief, it is vital that photographs are taken in optimal conditions of tide and lighting. To ensure that flying was undertaken in optimal conditions, we stated that we might not be able to conduct this element of Phase 2 at the same time as the desk-work, but would programme it to fit the theoretical ideal conditions. It is also clearly advantageous that an aerial sortie is fully informed by the results obtained by other components of the survey programme, and to this end a flying map has been prepared, on which target zones and sites have been identified In fact, tides, light and weather have meant that this aspect of work has not been possible within the timetable for producing this report and, with the agreement of Historic Scotland's Project Manager, the results of the aerial survey will be produced as early in 1997 as suitable conditions prevail, and a Supplement to the present Report will be prepared thereafter.

In many respects the palaeoenvironmental data required for the purposes of the project have already been collected, and one of the chief aspects of the work that was required is that of collation. Unfortunately, as much of this work has not been conducted with a specific archaeological/heritage interest and has occurred over the last 30 years, there are inevitably problems of compatibility of information and standards of research. The focus of most of the palaeoenvironmental research has been on Holocene deposits and Late glacial material is less well studied.

Phase 3

The archaeological survey undertaken required (as specified in the Historic Scotland procedure) to be systematic and to be conducted in all relevant land parcels (with the exception of unsafe intertidal areas and certain areas of cliffed coastline. In general on cliff lines the top of the cliff edge was walked, and a search was made for previously known sites on the cliff face, but the base of cliff edges could not be systematically walked.). Our initial estimate was that we could cover a minimum length of coast (including foreshore and immediate hinterland) of approximately 250km. We did not attempt to specify at the outset exactly which strips this examination would include, as the selection in part depended on access negotiations conducted after award of contract. There were obvious potential problems in gaining access, for example the extent of fieldwork that could be undertaken around the Luce Sands depended upon arrangements that could be made with the Ministry of Defence. CFA did, however, undertake to ensure that the field survey covered a representative sample of the various combinations of environmental settings and, on the cultural side, remains of diverse periods and types. In the event, both the rate of progress and the helpfulness of the MoD and other landowners allowed us to survey almost the entire 320km coastline.

The desk study was completed before fieldwork commenced, allowing the field teams to be supplied with data assembled froma range of sources for checking. In essence, the fieldwork comprised standard archaeological fieldwalking survey, combined with the recording of the erosional status of sites, the assessment of vulnerable parts of the landscape, and ground truthing of geomorphological data. We used GPS to assist in the determination of the location of sites for mapping as required in the Historic Scotland Procedure, where mapped features at the local scale did not provide accurate control points. Because of the restricted availability of various members of the project team, the survey was not done as a single sweep, but comprised a walk over by a team of archaeologists, several inspections by the geomorphologists and a final survey session by the geomorphologists in conjunction with CFA's Environmental scientist (Dr Cressey) on the project.

Survey conditions were not ideal, as extensive areas of thick vegetation cover of land above the High Water Mark, potentially masking small-scale archaeological features, proved to be a problem. Although the survey was conducted in the autumn and early winter of 1996 few problems were encountered with weather conditions. Some areas, of course, could not be walked. These included some areas of high cliffs, and, most significantly along the Solway coast, areas of intertidal mudflats that could not be traversed on foot for safety reasons.

Phase 4

We allowed a considerable time element for reporting, as we appreciated that a considerable volume of data was likely to be produced during the survey. The present Report has been produced in the format requested by Historic Scotland. Preceding surveys in the series described in the Introduction above had made progressive modifications to the Historic Scotland specification, based on lessons gained during the course of work, and the present Report has made a further number of minor modifications designed to help make the data more accessible. These involve separating the archaeological data into separate lists for sites on firstly the coastal edge and foreshore and secondly those located within the hinterland areas that were examined.

3 STUDY RESULTS

This part of the report presents the survey results. For the purposes of this study, the coastline was divided into 56 sections. Each section of the survey is presented with a brief introduction to its hinterland geology and coastal morphology, followed by the identification of its erosion class. Then built heritage and archaeological resources are briefly enumerated. Following these introductory pages, are the gazetteer pages for each subject, each page of gazetteer entries accompanied by its respective map at the scale of 1:25,000.

Analysis of the results is presented in a series of case studies comprising Part 4 of this Report, with more general analyses and recommendations being held over until Part 5.

Within the study zone, there are extensive areas of shore which presently appear to be stable, but which have at some point been armoured by coastal defences. It is assumed that the defences are there because of past erosional problems and therefore it is considered that the addition of a new erosional class, extending those used in previous surveys, might be appropriate to categorise such sectors. These form, effectively, sectors of meta-stable shore - which are only stable because of the emplacement of man-made coastal defences. Should these defences fail or be allowed to fail under a policy of managed retreat, then archaeological sites behind them would of course be threatened. This proposed coastal category has not been introduced in this *Report*, but the descriptions contained in the various sectional accounts reveal the existence of this phenomenon. It is important to draw attention to the existence of such man-made defences, since any policy change affecting their upkeep could over time produce indications that the number of archaeological sites currently actively threatened by erosion could be a serious underestimate.

MAP 1: CARRICK POINT TO MARY POINT BAY

Hinterland Geology and Coastal Geomorphology: This section includes the peninsula of the Mull of Galloway which forms the most southerly point of Scotland. The underlying geology consists of the Wenlock Series that includes greywackee and shale. On the Mull of Galloway the hinterland comprises a shallow layer of soil derived from till deposits that overly sheer precipitous cliffs. Further north at Carrickcoil, less steep cliffs continue and again these are covered with till with shallow podsol formations. An isthmus has been formed between West and East Tarbet bay and a platform of land divides the two. The foreshore at East Tarbet is predominately shingle. The intertidal zone becomes much shallower towards Maryport Bay with sand bars, shingle and boulders. The hinterland comprises raised beach deposits with relict shore platforms on which are developed shallow brown forest soils. Fluvioglacial deposits (primarily sands and gravels) outcrop at Maryport Bay. Immediately north of the bay, raised beach deposits occur and continue to Cailness Point.

Erosion Class: This section of coastline is exposed to north-easterly gales. The base of the cliffs are being eroded by wave action and boulder fall is common at their base which suggests past and on-going cliff-edge erosion. Coastal retreat is, however, predicted to be relatively slow owing to the fairly resilient nature of the greywackee cliffs. Folding of the lithology exposes units of different strengths. Weaker units such as mudstones are being preferentially eroded, forming deep gullies. East Tarbet is trapping shingle that is probably derived from the raised beach area further north. A shallow intertidal zone continues northwards from Back Bay (NX 142330) and continues to Cailness Point. The intertidal zone between these locations consists of poorly sorted fluvioglacial pebbles and cobbles. Sandy spits occur where shingle is absent. Shingle is banked at the HWM but longitudinal grading is not evident. Accretion is occurring in parts and on the whole the HWM area appears to be stable.

Built Heritage & Archaeology: The archaeology of this section is varied, ranging from later prehistoric monuments, such as The Dunnan promontory fort and possibly the earthworks at the Mull of Galloway, to early Christian/medieval monuments, such as St Medan's Chapel and Chapel Wells, and to more recent monuments such as the nineteenth century cottage and quay at East Tarbet Bay (Graham, 1979, 46). A cluster of monuments are situated at or close to the isthmus of the Mull of Galloway while other sites are distributed in a more scattered fashion along the coast. There is no indication of coastal erosion affecting the recorded sites, with the exception of the earthwork (NX13SW 17) which is suffering from minor erosion derived from wave abrasion of the coastal edge at that point. Of greater significance to the survival of sites in this section is natural deterioration, and particularly for the monuments comprising earthworks, the detrimental action of animals; principally cattle and rabbits.

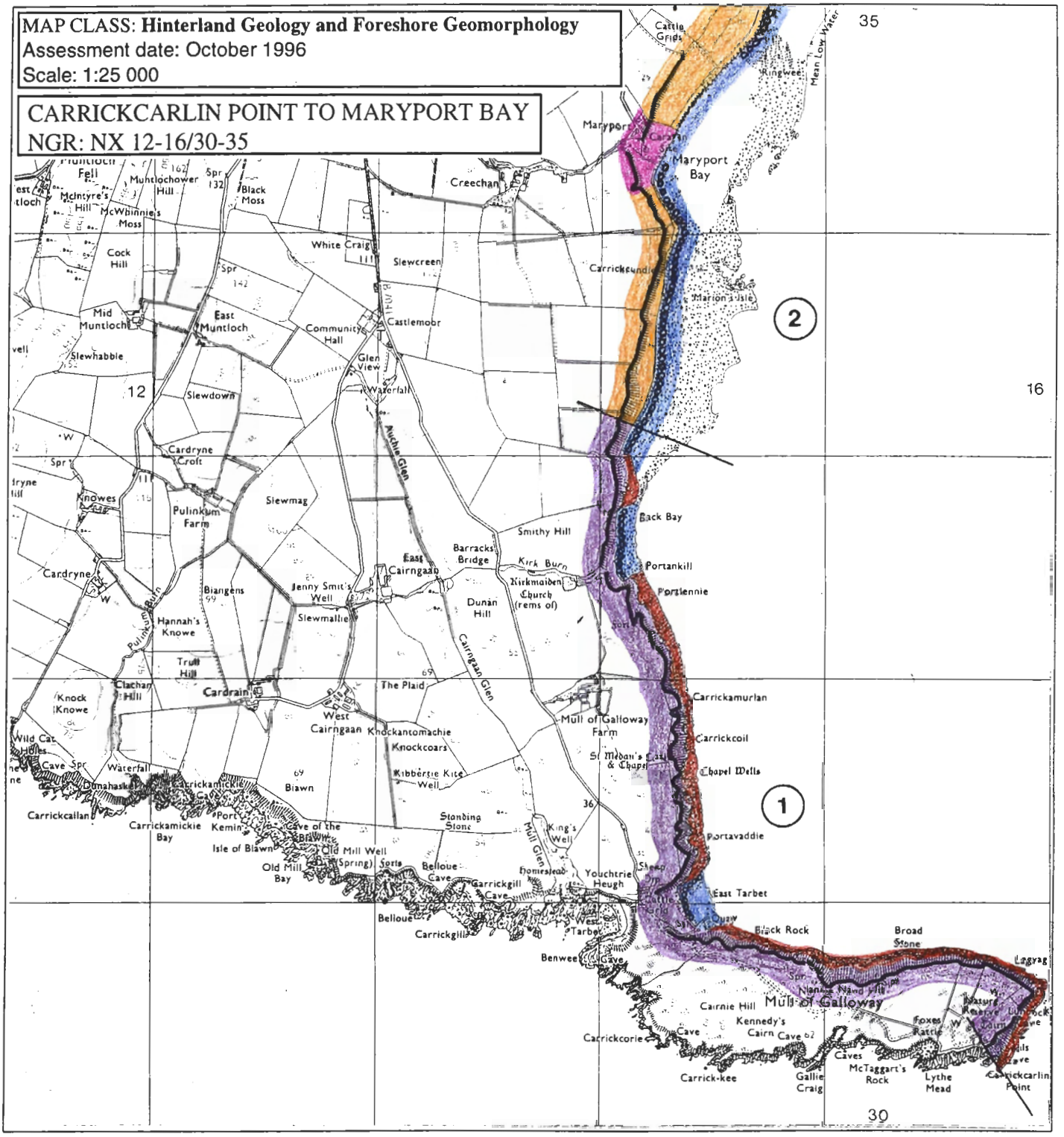
Map 1: Hinterland Geology and Coastal Geomorphology

1. CARRICKCARLIN POINT, CARRICKCOIL AND BACK BAY
NX 155 307
1.4km
Mainly rock platform
Cliffs (> 10m)
Till over visible rock
An exposed rocky promontory headland consisting of precipitous dipping Silurian greywackee and slate overlain by till and shallow humus-iron podsols. A narrow isthmus has been formed at East Tarbet where graded shingle banks are backed by a steep grassy slope. Steep till slope overlies incised rock platform at Carrickcoil. Cliff and rock platform give way to a boulder and shingle beach at Back Bay.

2. MARYPORT BAY
NX 146 350
4.5km
Cliff (< 10m)
Raised beach/relict shore platform
Irregular high terraced raised beach deposits at Carrickundle above shingle and boulder beach. The raised beach is indented at Maryport where glacially derived sand and gravel are exposed and meet a sand, shingle and boulder strewn shoreline. Towards Cailness Point, an exposed promontory headland is backed by marine sands and shingle with fairly shallow brown forest soils.

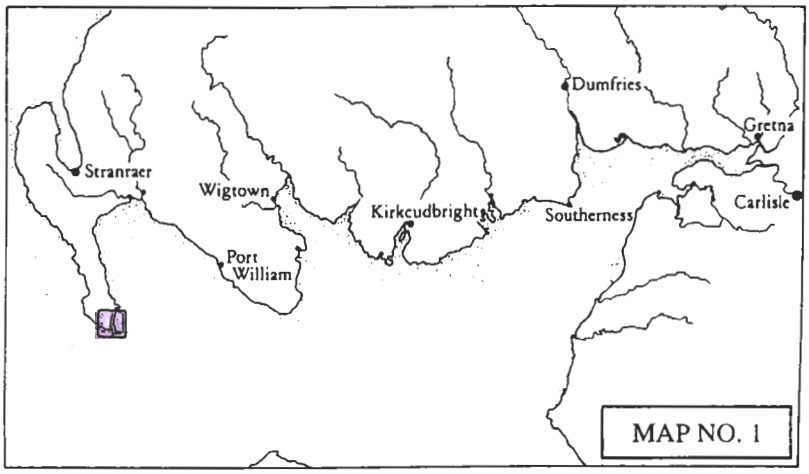
MAP CLASS: **Hinterland Geology and Foreshore Geomorphology**
Assessment date: October 1996
Scale: 1:25 000

CARRICKCARLIN POINT TO MARYPORT BAY
NGR: NX 12-16/30-35



KEY

Hinterland Geology	Derwent Code	Colour
Drift, boulder clay	French Grey	
Drift, boulder clay over visible rock	Dark Violet	
Raised beach and marine deposits	Golden Brown	
Blown sand	Pink Madder Lake	
Glacial sand and gravel	Magenta	
Alluvium	Emerald Green	
Coastal Geomorphology		
Mainly rock platform	Deep vermilion	
Mainly sand	Ultramarine	
Mainly alluvial/marine mud	Venetian Red	
Marsh	May Green	
Coast Edge		
Low edge (<5m)	Thin black line	
Cliff (>5m)	Solid black line	
Man made barrier	Black line with spines	
Shingle beach	Small circles	
Human disturbance	Black carats	



MAP 1: EROSION

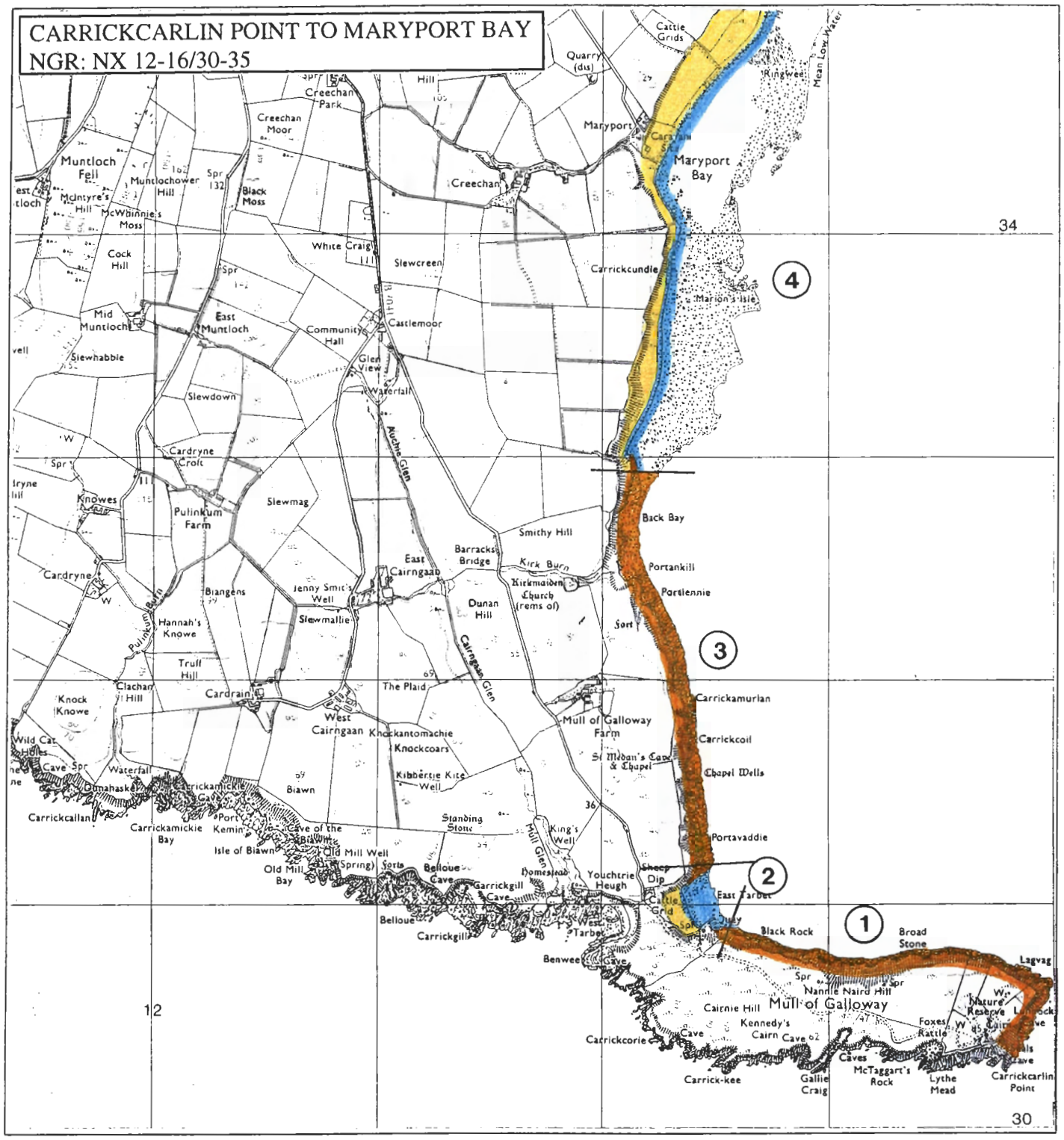
1. CARRICKCARLIN POINT, BLACK ROCK
NX 155 307
1.4km
Eroding or stable
This unit has an exposed north-easterly aspect. The cliff base comprises deep gullies that are being scoured and continually abraded by wave action. Erosion is predicted as occurring only slowly due to the fairly resilient nature of the greywackee.

2. EAST TARBERT BAY
NX 144 310
0.4km
Accreting or stable
An exposed bay consisting of boulders and shingle that is banking up against the base of a quay and against a cattle eroded back slope. There is no evidence of longitudinal grading along the beach but the bay is apparently forming a re-entrant trap for shingle along the inshore wave zone. Storm run-off and cattle are eroding the steep slope down to the beach.

3. CARRICKAMURLAN
NX 144 320
1.7km
Eroding or stable
This stretch of indented cliff is incised with numerous deep gullies between steeply dipping slates that are continually scoured and abraded. Boulder accumulation within the gullies attests to rock fall but the process is considered to be very slow.

4. MARYPORT BAY, CAILNESS POINT.
NX 146 350
Accreting or stable
An exposed beach with an easterly aspect. The wide intertidal zone contains numerous sand and shingle bars. The beach is predominantly shingle that forms a gradual incline to the HWM.
A very wide intertidal zone continues north of Cailness Point. The higher shore margin is consolidated with grass cover and suggests that this region of coast is at the present stable.

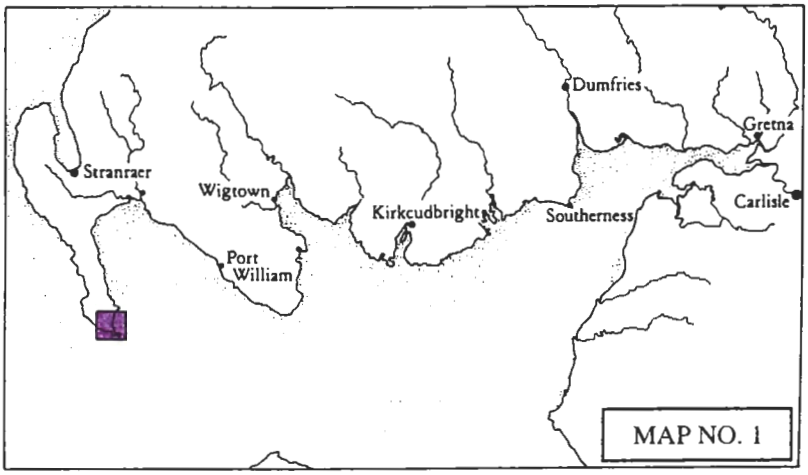
CARRICKCARLIN POINT TO MARYPORT BAY
NGR: NX 12-16/30-35



KEY

Erosion class	Derwent Code	Colour
Definitely accreting	Prussian Blue	
Accreting/stable	Light Blue	
Stable	Grass Green	
Stable/eroding	Deep Chrome	
Definitely eroding	Deep Vermilion	
Both accreting and eroding	Imperial Purple	
No access	Blank	
Land below 10m	Straw Yellow	

MAP CLASS: **EROSION**
Assessment date: 19.9.96
Scale 1:25 000



MAP 1: BUILT HERITAGE AND ARCHAEOLOGY

Sites on the Coast Edge & Foreshore

NX13SW 17
NX 1452 3086
MULL OF GALLOWAY
Earthwork
Scheduled Ancient Monument
1st Mill. BC/AD
Fair
Monitor

NX 1445 3089
EAST TARBET BAY
Cottage & Quay
Statutory Listed Building
19th century
Good
Nil

NX13SW 11
NX 1439 3159
CHAPEL WELLS, MULL FARM
Well
1st & 2nd Mill. AD
Uncertain; not located
Nil

NX13SW 10
NX 1437 3159
ST MEDAN'S CHAPEL
Cave & Chapel
Scheduled Ancient Monument
1st & 2nd Mill. AD
Uncertain; not located
Nil

NX13SW 8
NX 1417 3229
THE DUNNAN, PORTANKILL
Promontory Fort
Scheduled Ancient Monument
1st Mill. BC/AD
Good
Nil

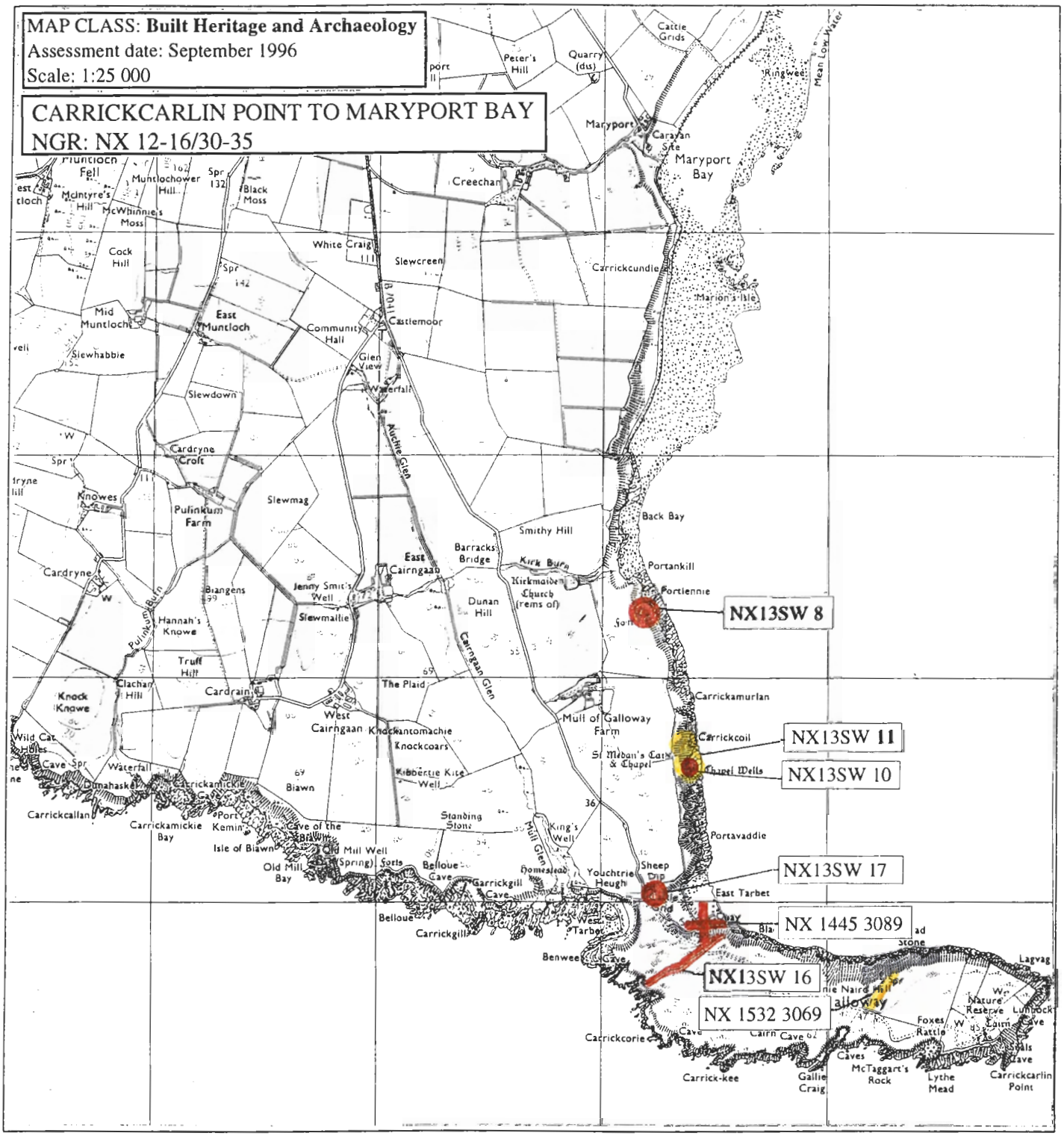
Sites in the Hinterland

NX 1532 3069
MULL OF GALLOWAY
Drystone Fieldbank
18/19/20th century
Good
Nil

NX13SW 16
NX 1422 3104
MULL OF GALLOWAY
Earthwork
Uncertain
Good
Nil

MAP CLASS: **Built Heritage and Archaeology**
Assessment date: September 1996
Scale: 1:25 000

CARRICKCARLIN POINT TO MARYPORT BAY
NGR: NX 12-16/30-35



KEY

Site location	Symbol	Colour	Significance
NGR ref. - eg. NX 143 368	Roundel - Solid, (or area)	Red	Protected Ancient Monument
	Cross	Red	Listed Historic Building
	Roundel - Open, (or area)	Red	Monument formally proposed by Historic Scotland for designation
	Roundel - Solid, (or area)	Yellow	Other known Ancient Monument
NMRS ref. - eg. NX13 SW17	Dashed outline	Yellow	Gardens/Designed landscape
	Roundel - Solid, (or area)	Yellow	Undesignated wreck
	Area	Green	Insufficient information; more work needed
	Area	Blue	Probably archaeologically sterile

MAP 2: CAILNESS POINT TO CAVE OF GRENNAN

Hinterland Geology and Coastal Geomorphology: This section of the coast has a substantially lower cliff-edge than the coastline in Map 1. However this section is still very exposed. The hinterland consists of raised beach deposits (sand, gravel and boulders) glacial sands and gravel and possibly morainic drift at Drummore. The shoreline is more indented forming a series of sandy bays at Cairngarrock, Drummore and Kilstay respectively. The bays generally contain poorly sorted boulders of varying sizes intermixed with sand and shingle spits.

Erosion Class: The majority of this coast line is classified as stable or accreting, however in Units 4 and 6 serious erosion is occurring. At Drummore harbour recent concrete sea and beach defences have been constructed. Here gabion baskets have been placed to control the loss of sand and shingle at the HWM but these works are failing. At Low Gurhie, c.30m of concrete sea wall has been displaced and now lies in pieces across the foreshore. Builders rubble has been used to shore up breaches but this is failing due to recent storms. Kilstay Bay is protected by a sea wall and the shore was seen to be accreting or stable.

Built Heritage & Archaeology: The majority of sites in this section date to the eighteenth, nineteenth and early twentieth centuries and are clustered in and around the village of Drummore. Reflecting the past predominance of maritime activities (Graham, 1979, 45) they include stores, mills, an inn, fishing stakes and a harbour. Several previously unrecorded World War 2 defences are situated at Cailness Point south of the village. Three prehistoric sites, comprising two flint scatters and a standing stone at Terally Bay are distributed along the immediate coastal hinterland northward from Drummore. The monuments situated on the coast and foreshore are affected by limited erosion. The majority of sites however are located in the hinterland and are not threatened by coastal erosion. Natural deterioration and land subsidence is adversely affecting the World War 2 monuments while animal action may be damaging the standing stone at Killstay.

Map 2: Hinterland Geology and Coastal Geomorphology

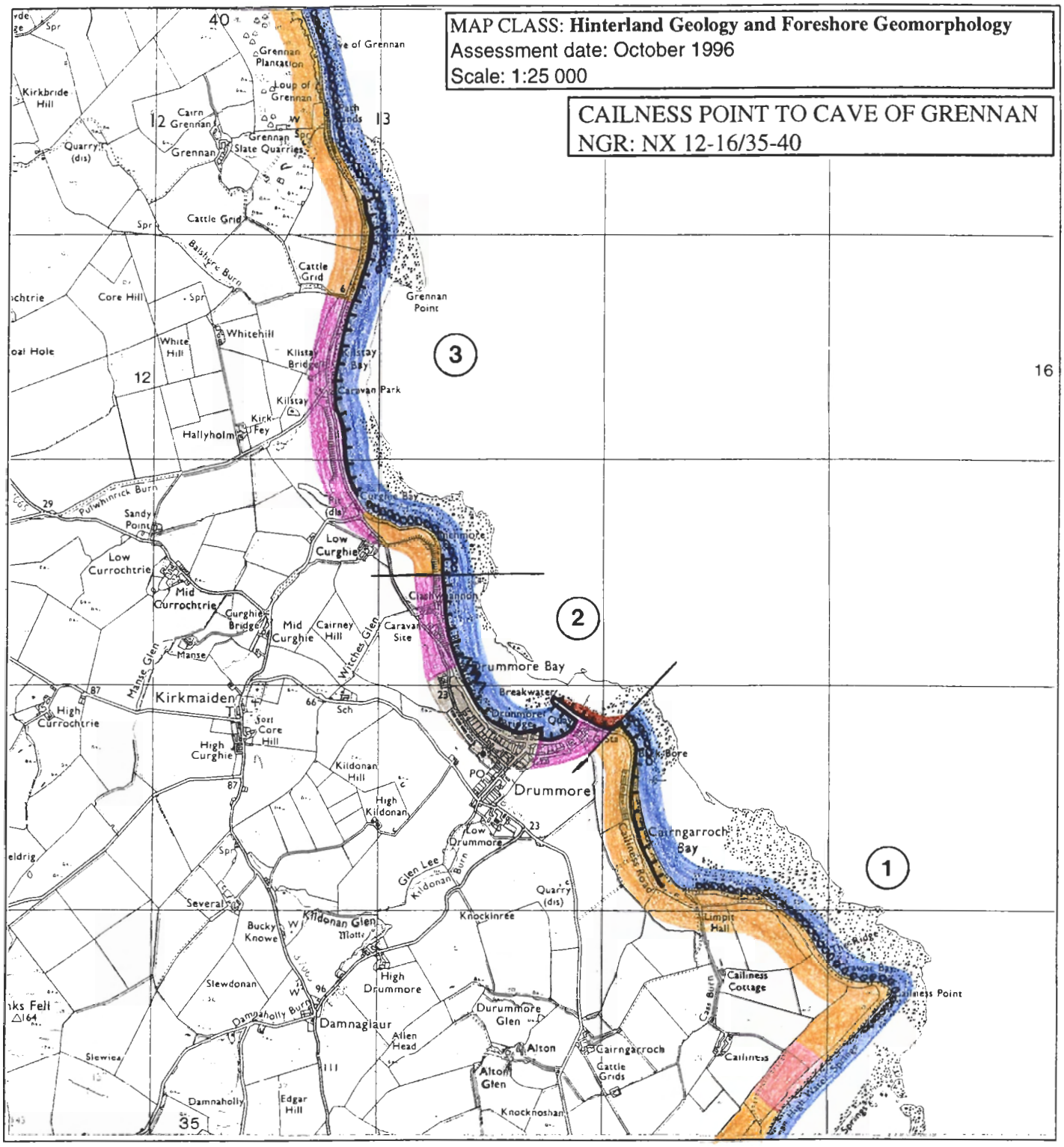
1. South of CAILNESS POINT to CAIRNGARROCH BAY
NX 142 363
1.8km
Cliff (< 10m)
Raised beach and marine deposits
This unit has a north-easterly aspect and is very exposed. The hinterland consists of undulating raised beach deposits. Shingle and sand dominate the wide intertidal area and become progressively sandier towards Cairingaroch Bay. A recently built concrete sea wall defends c.75% of the bay.

2. DRUMORE HARBOUR to CURGHIE BAY
NX 135 368
1.5km
Low edge (< 5m)
Drift till, till over rock/raised beach deposits
Drumore and the hinterland surrounding the bay is dominated by till. Raised beach deposits outcrop at Inchmore that forms the headland of Drumore Bay. The shoreline is vulnerable to storm conditions from the north-east.

3. KILSTAY BAY to TERALLY POINT
NX 128 394
2.7km
Cliff (< 10)
Till, raised beach
Steep raised beach deposits and till form the major deposit over the hinterland of this unit Concrete sea walls have been built to protect the coastal road running alongside Kilstay Bay, Grennan Point and Terally. The foreshore consists of sand and shingle. Rocky outcrops occur at Terally Point.

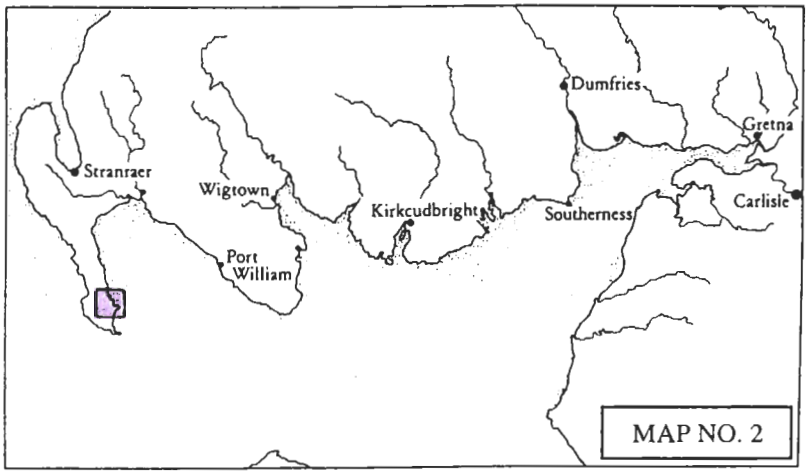
MAP CLASS: **Hinterland Geology and Foreshore Geomorphology**
Assessment date: October 1996
Scale: 1:25 000

CAILNESS POINT TO CAVE OF GRENNAN
NGR: NX 12-16/35-40



KEY

Hinterland Geology	Derwent Code	Colour
Drift, boulder clay	French Grey	
Drift, boulder clay over visible rock	Dark Violet	
Raised beach and marine deposits	Golden Brown	
Blown sand	Pink Madder Lake	
Glacial sand and gravel	Magenta	
Alluvium	Emerald Green	
Coastal Geomorphology		
Mainly rock platform	Deep vermilion	
Mainly sand	Ultramarine	
Mainly alluvial/marine mud	Venetian Red	
Marsh	May Green	
Coast Edge		
Low edge (<5m)	Thin black line	
Cliff (>5m)	Solid black line	
Man made barrier	Black line with spines	⊣⊣⊣⊣⊣⊣
Shingle beach	Small circles	ooooooo
Human disturbance	Black carats	^^^^^^^



MAP 2: EROSION

1. CAILNESS POINT to LIMPET HALL
NX 148 360
1km
Accreting or stable
An exposed stretch of coastline with a north-easterly aspect. The wide intertidal zone is strewn with boulders intermixed with areas of sand. The HWM consists of banked shingle and well vegetated. The banks above the shore are well vegetated and appear stable.

2. CAIRNGARROCH BAY to DRUMMORE HARBOUR
NX 142 366
1km
Stable
A public road has been defended by a concrete sea wall at Cairngarroch Bay. Gabion baskets and a breakwater have also been implemented at Back Bore and towards the quay in an attempt to trap sand and shingle. These works appear to have stabilised erosion in the short term.

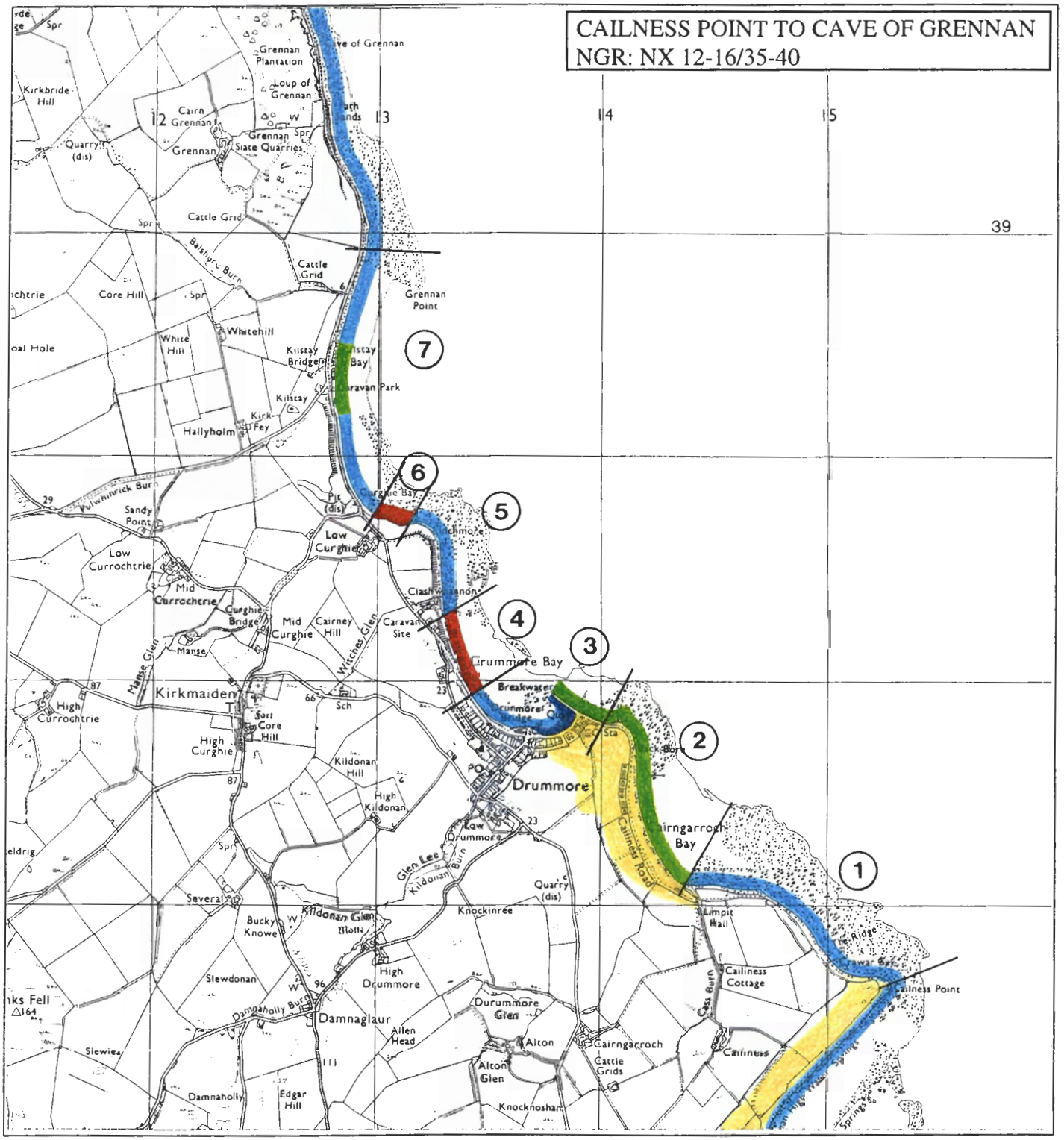
3. DRUMMORE HARBOUR
NX 136 368
1km
0.5km
Accreting or stable
Drummore harbour is accreting with sand and silts due possibly to lack of use and sediment entrapment.

4. DRUMMORE BAY to CLASHWANNON
NX 134 372
0.4km
Definitely eroding
A concrete sea wall and Gabion baskets have been constructed to protect the former a former coast road. It has been undermined in parts due to storm action and the abrasive effects of boulders that tend to scour the softer clay behind the wall.

5. INCHMORE
NX 133 376
0.4km
Accreting or stable
A concrete sea wall and stone armouring has been constructed and overlooks a wide intertidal area comprising boulders and sandy spits. Shingle is banked up at the HWM and this region appears to be stable for the time being.

6. LOW CURGHIE
NX 131 377
0.2km
Definitely eroding
With an exposed north-easterly aspect this area of coast is undergoing serious erosion from storm damage. A concrete sea has been displaced and large concrete blocks lie c.10m from the bank that they were revetted into. Some 30m of wall has been breached and in an attempt to consolidate the bank, modern building rubble has been tipped along the foreshore. Mass movement is being accelerated due to the scouring out of the softer material, namely till behind the existing sea wall.

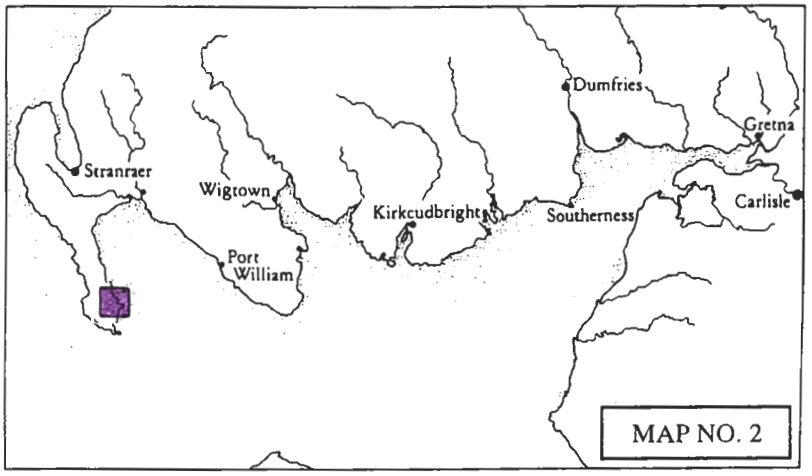
7. KILSTAY BAY to GRENNAN POINT
NX 128 385
1.2km
Accreting or stable
A concrete sea wall protects the coastal road that skirts Kilstay Bay to Grennan Point. The bay has an exposed easterly aspect and its intertidal zone is wide with sand and shingle. Shingle has been banked against the foreshore and this stretch of shore appears to be stable and accreting in parts.



KEY

Erosion class	Derwent Code	Colour
Definitely accreting	Prussian Blue	
Accreting/stable	Light Blue	
Stable	Grass Green	
Stable/eroding	Deep Chrome	
Definitely eroding	Deep Vermilion	
Both accreting and eroding	Imperial Purple	
No access	Blank	
Land below 10m	Straw Yellow	

MAP CLASS: **EROSION**
Assessment date: 20.9.96
Scale 1:25 000



MAP 2: BUILT HERITAGE AND ARCHAEOLOGY

Sites on the Coast Edge & Foreshore

NX 1413 3688
BACK BORE, DRUMMORE
Fishing Stakes
19/20th century
Poor
Monitor

NX13NW 34
NX 138 368
DRUMMORE
Harbour
19th century
Good
Nil

NX 1329 3729
INCHCOLM, DRUMMORE
Old Road & Bridge
18/19th century
Fair
Monitor

NX 1292 3792
CURGLUE BAY
Fishing Stakes
19/20th century
Poor
Monitor

NX13NW 14
NX 1286 3927
GRENNAN
Flint Scatter
6 - 2 Mill. BC
Fair
Monitor

Sites in the Hinterland

NX 1520 3565
CAILNESS POINT
Pillbox
Mid 20th century
Good
Nil

NX 1507 3567
CAILNESS POINT
Pillbox
Mid 20th century
Good
Nil

NX 1506 3564
CAILNESS POINT
Signalling Tower
Mid 20th century
Good
Nil

NX13NW 50
NX 1361 3674
SHIP INN, DRUMMORE
Hotel
18/19th century
Good
Nil

NX13NW 63
NX 1365 3674
MILL ST, DRUMMORE
Store
19th century
Good
Nil

NX13NW 69
NX 1368 3671
DRUMMORE MILL
Watermill
19th century
Good
Nil

NX13NW 36
NX 137 367
WYLLIE'S MILL,
DRUMMORE
Mill
Mid 19th century
Good
Nil

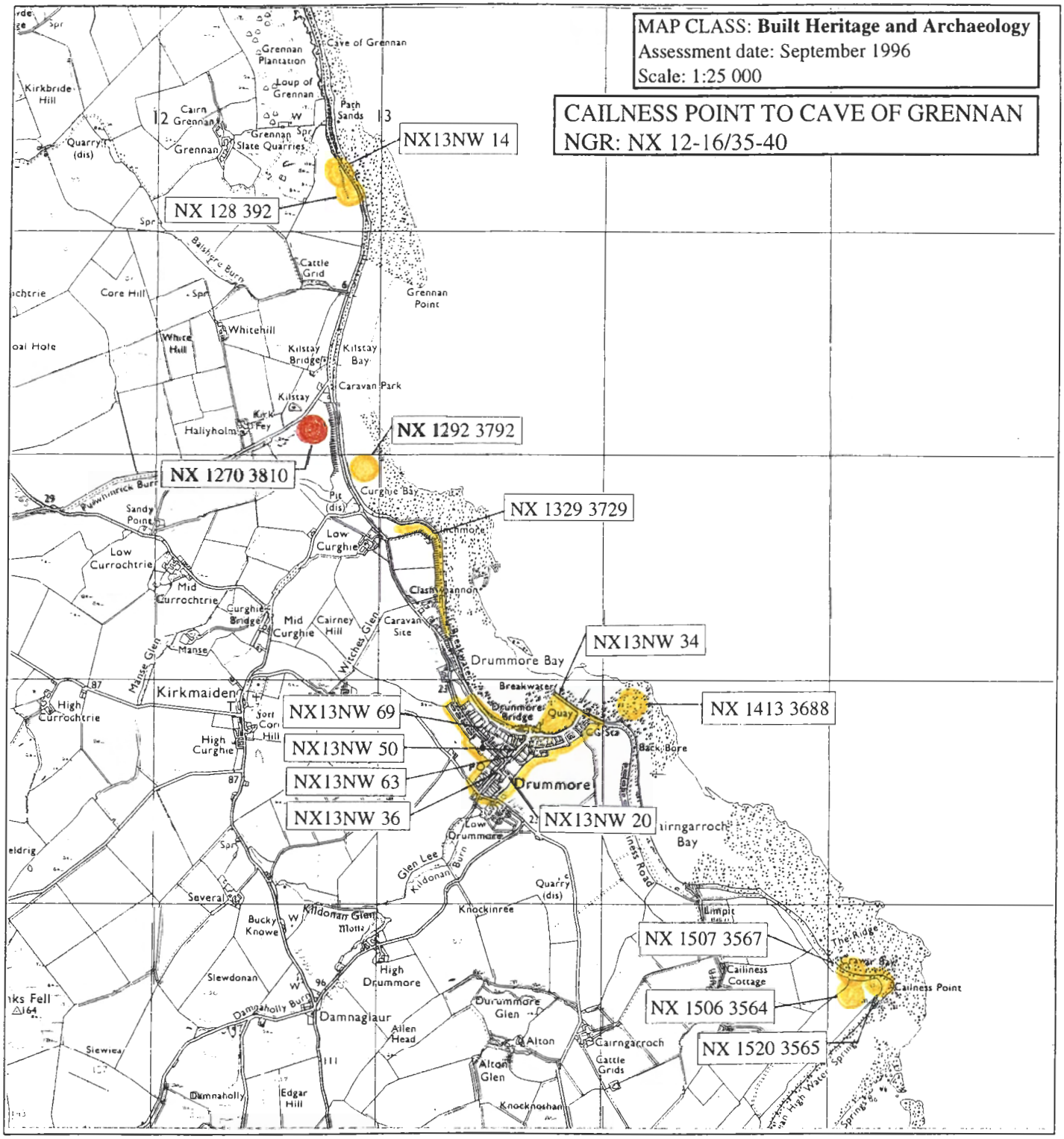
NX13NW 20
NX 1372 3670
DRUMMORE
Flint Scatter
6-2 Mill. BC
Uncertain; not visited
Nil

NX 1270 3810
KILLSTAY
Standing Stone
Scheduled Ancient
Monument
3rd & 2nd Mill. BC
Good
Nil

NX 128 392
GRENNAN
Rig & Furrow
2nd Mill. AD
Good
Nil

MAP CLASS: **Built Heritage and Archaeology**
Assessment date: September 1996
Scale: 1:25 000

CAILNESS POINT TO CAVE OF GRENNAN
NGR: NX 12-16/35-40



KEY

Site location	Symbol	Colour	Significance
NGR ref. - eg. NX 143 368	Roundel - Solid, (or area)	Red	Protected Ancient Monument
	Cross	Red	Listed Historic Building
	Roundel - Open, (or area)	Red	Monument formally proposed by Historic Scotland for designation
NMRS ref. - eg. NX13 SW17	Roundel - Solid, (or area)	Yellow	Other known Ancient Monument
	Dashed outline	Yellow	Gardens/Designed landscape
	Roundel - Solid, (or area)	Yellow	Undesignated wreck
	Area	Green	Insufficient information; more work needed
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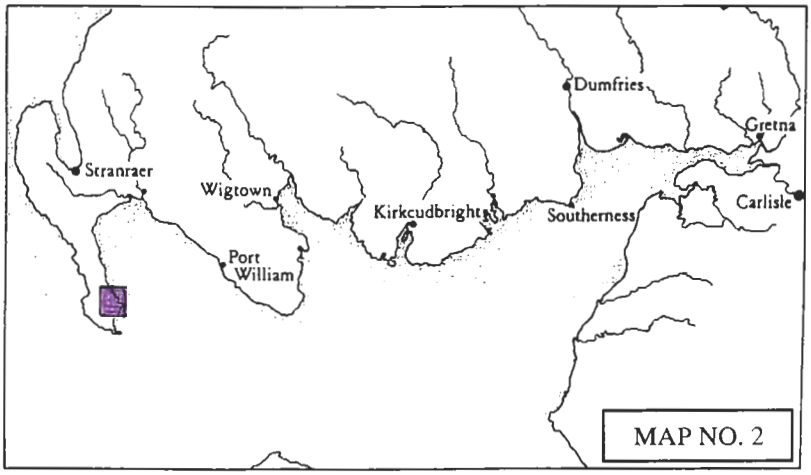


MAP 3: DUNGAMEN BAY TO LONGRIGG PLANTATION

Hinterland Geology and Coastal Geomorphology: The hinterland geomorphology consists mainly of well formed raised shorelines which are sub-parallel to the shore. Typically these deposits contain layers of sand, gravel and boulders that exhibit a moderate degree of stratification. Fluvioglacial sands and gravel occur at Terally Bay. The shoreline geomorphology consists of a fairly irregular shoreline forming bays at the aforementioned Terally Bay and New England Bay. The beach is mostly sand with shingle banked at the HWM. Greywackee rock assigned to the Wenlock Series outcrops along the shore at Terally point and between Logan Mills and Longrigg Plantation (Unit 3).

Erosion Class: The foreshore is classified as accreting or stable from Grennan Point to Myrock Point (Unit 1) as shingle and sand form a noticeable berm at the HWM. New England Bay has a concrete sea wall and is protecting the sandy foreshore that is stable. The wide foreshore up to Logan Mills is stable and consists of shingle, boulders and sandy spits. From Logan Mills to Longrigg Plantation (Unit 3) the foreshore is dominated by outcropping greywackee rock platform which has been scoured into a series of shallow gullies. However due to the resilience of this material erosion is considered to be very slow.

Built Heritage & Archaeology: The archaeology of this section is concentrated in two clusters; one consisting of a standing stone, a long cist cemetery, a possible motte and a disused coal store at Terally Bay, and another group of sites at Logan Mills consisting of a sawmill, a windmill, a boat shed and a boat noost. The first group includes sites ranging in date from prehistory to the nineteenth century, while the second group has a much tighter range of dates from the seventeenth to the twentieth centuries. The coastal sites are generally slowly abrading, whether through natural deterioration or coastal erosion. The sites in the hinterland, which include several disused buildings, are suffering from natural deterioration.

Map 3: Hinterland Geology and Coastal Geomorphology

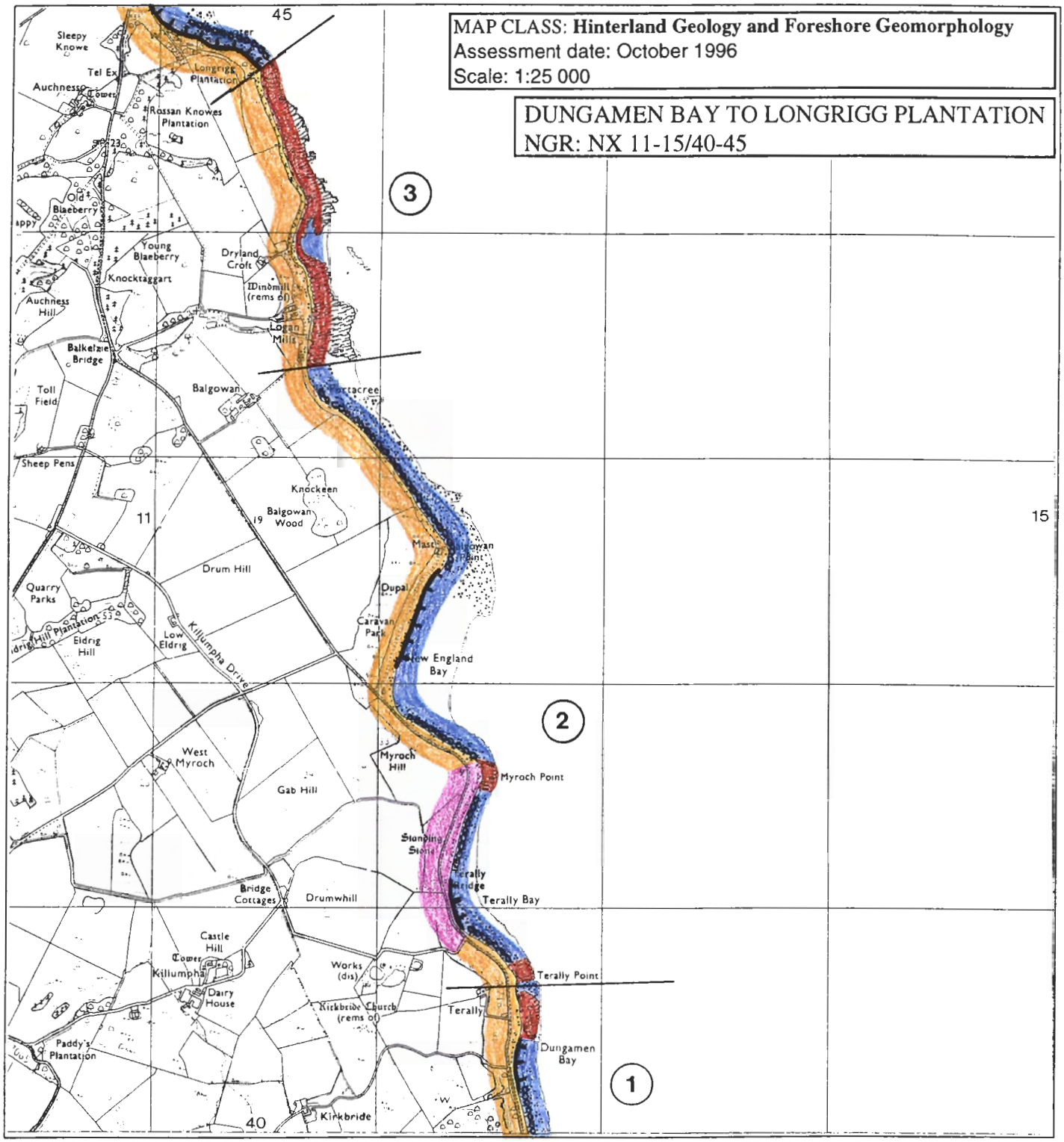
1. KILSTAY BAY to TERALLY POINT
NX 128 394
2.7km
Cliff (< 10)
Till, raised beach
Steep raised beach deposits and till form the major deposit over the hinterland of this unit Concrete sea walls have been built to protect the coastal road running alongside Kilstay Bay, Grennan Point and Terally. The foreshore consists of sand and shingle. Rocky outcrops occur at Terally Point.

2. TERALLY BAY to LOGAN MILLS
NX 121 420
3.4km
Cliff (< 5m)
Raised beach and till
The hinterland of this unit consists of raised beach and till deposits with a low cliff edge. The foreshore has been protected at Terally Bay by a sea wall. The intertidal area is wide in parts with cleaved greywackee exposed at Terally Point. Terally Bay and New England Bay beaches are strewn with poorly sorted boulders. Other areas within the bays are covered with sand. Boulders and sand continue to Portacree.

3. LOGAN MILLS to LONGRIGG PLANTATION
NX117 440
1.3km
Low edge (< 5m)
Raised beach & mainly rock platform
Raised beach deposits dominate the hinterland of this unit. The foreshore consists of cleaved steeply dipping greywackee platforms. These shelve of to the vertical in places.

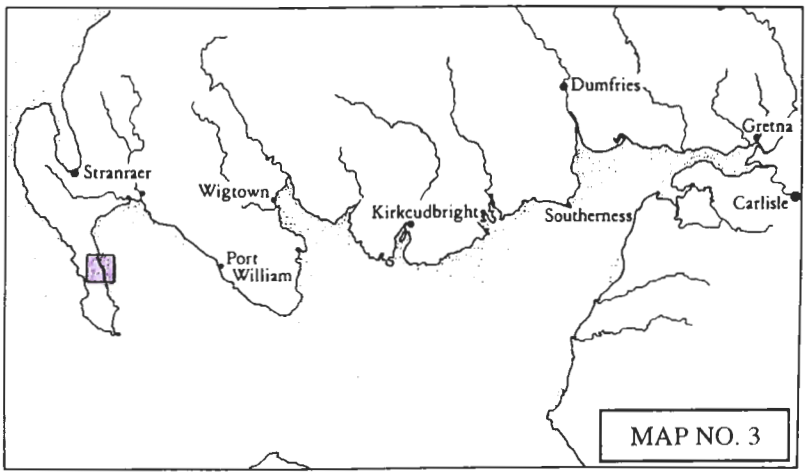
MAP CLASS: **Hinterland Geology and Foreshore Geomorphology**
Assessment date: October 1996
Scale: 1:25 000

DUNGAMEN BAY TO LONGRIGG PLANTATION
NGR: NX 11-15/40-45



KEY

Hinterland Geology	Derwent Code	Colour
Drift, boulder clay	French Grey	
Drift, boulder clay over visible rock	Dark Violet	
Raised beach and marine deposits	Golden Brown	
Blown sand	Pink Madder Lake	
Glacial sand and gravel	Magenta	
Alluvium	Emerald Green	
Coastal Geomorphology		
Mainly rock platform	Deep vermilion	
Mainly sand	Ultramarine	
Mainly alluvial/marine mud	Venetian Red	
Marsh	May Green	
Coast Edge		
Low edge (<5m)	Thin black line	
Cliff (>5m)	Solid black line	
Man made barrier	Black line with spines	
Shingle beach	Small circles	
Human disturbance	Black carats	



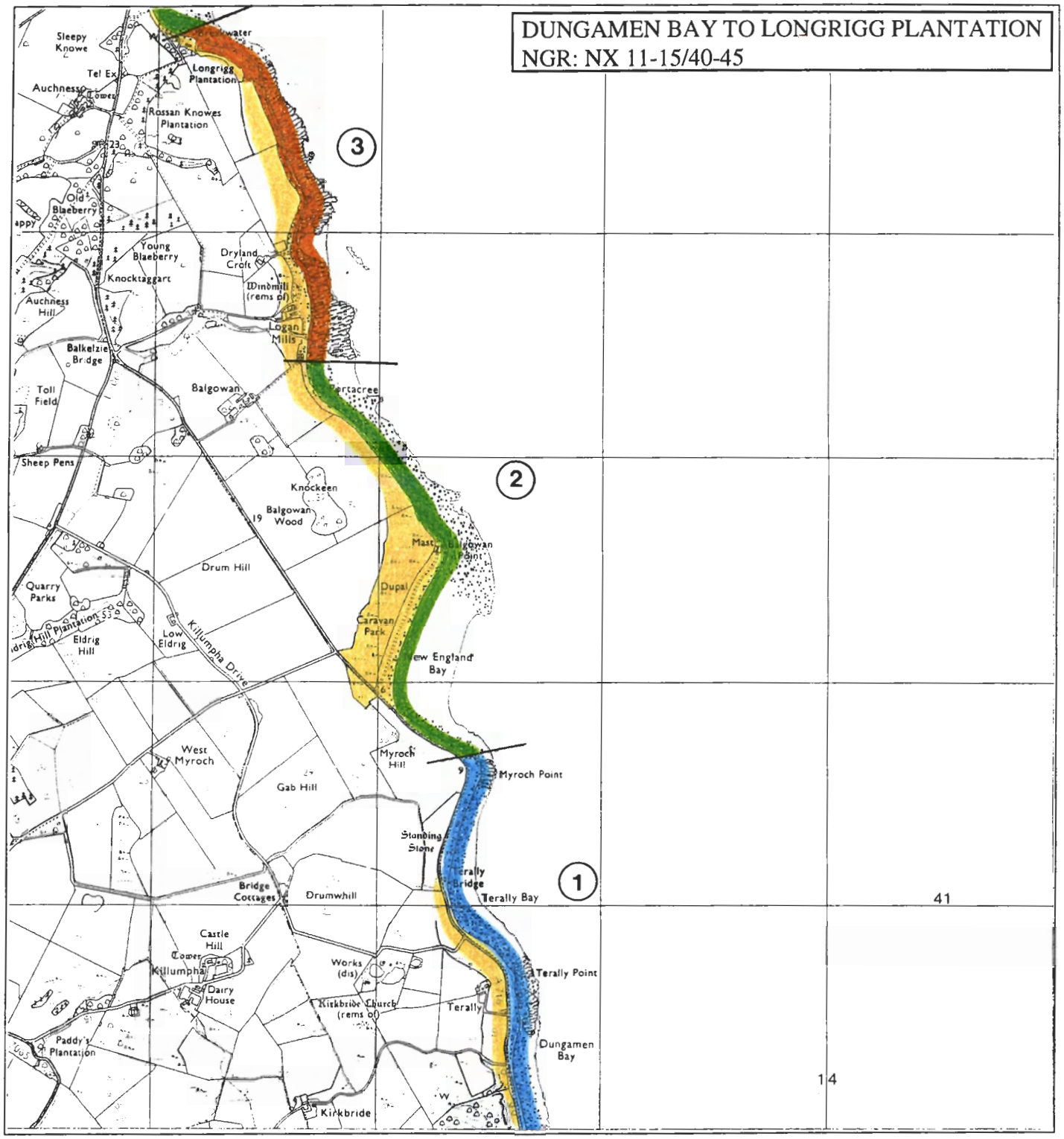
MAP 3: EROSION

1. GRENNAN POINT to MYROCH POINT
NX 127 400
2.8km
Accreting or stable
This unit has a wide intertidal zone that consists of boulders, cobbles and sand. There is evidence of accretion as shingle is banking up at the HWM. This is noticeable at Path Sands (NX 128396) and at Terally Bay (NX 124410) A concrete sea wall protects the coast road skirting Terally Bay. Shingle is now banking in front of it.

2. NEW ENGLAND BAY to PORTACREE
NX123 426
2km
Stable
A concrete sea wall protects New England Bay which is predominately sandy and strewn with boulders. The stretch of coast beyond Balgowan Point is a wide intertidal area with a mixture of boulders and sandy spits. In general terms the coastline appears to be stable and accreting in other parts.

3. LOGAN MILLS to LONGRIGG PLANTATION
NX116 440
1.5km
Eroding or stable
This unit has an exposed easterly aspect and consists of outcropping cleaved and dipping greywackees. Erosion is occurring albeit very slowly as the base of the rock is abraded.

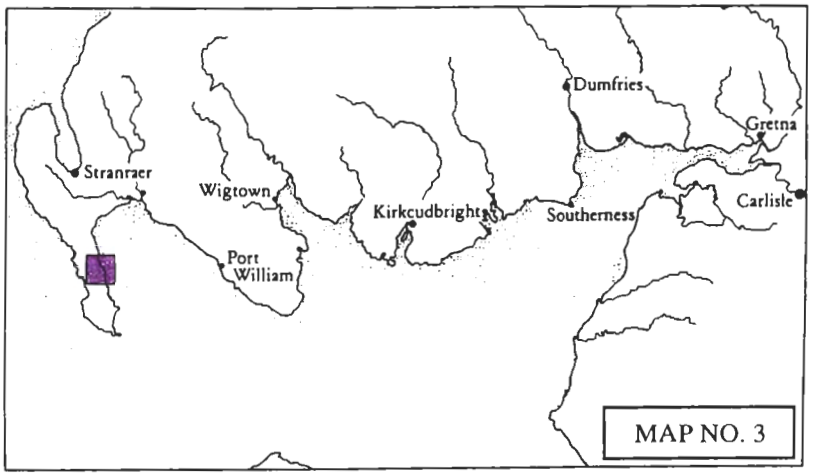
DUNGAMEN BAY TO LONGRIGG PLANTATION
NGR: NX 11-15/40-45



KEY

Erosion class	Derwent Code	Colour
Definitely accreting	Prussian Blue	
Accreting/stable	Light Blue	
Stable	Grass Green	
Stable/eroding	Deep Chrome	
Definitely eroding	Deep Vermilion	
Both accreting and eroding	Imperial Purple	
No access	Blank	
Land below 10m	Straw Yellow	

MAP CLASS: **EROSION**
Assessment date: 20.9.96
Scale 1:25 000



MAP 3: BUILT HERITAGE AND ARCHAEOLOGY

Sites on the Coast & Foreshore

NX 1230 4111
TERALLY BAY
Coal Store
Statutory Listed Building
19th century
Fair
Nil

NX14SW 22
NX 1232 4182
NEW ENGLAND BAY
Fish-trap
Uncertain
Poor
Monitor

NX 1167 4392
LOGAN MILLS
Boat Noost
Uncertain
Poor
Monitor

NX 1122 4492
CHAPEL ROSSAN BAY
Breakwater
Uncertain
Fair
Monitor

Sites in the Hinterland

NX 1225 4110
TERALLY
Possible Motte
12 & 13th century
Fair
Nil

NX14SW 8
NX 1227 4123
TERALLY
Long Cist Cemetery; Flints
1st/2nd Mill. AD
Good
Nil

NX14SW 1
NX 1228 4127
TERALLY
Standing Stone
Scheduled Ancient Monument
3rd & 2nd Mill. BC
Good
Nil

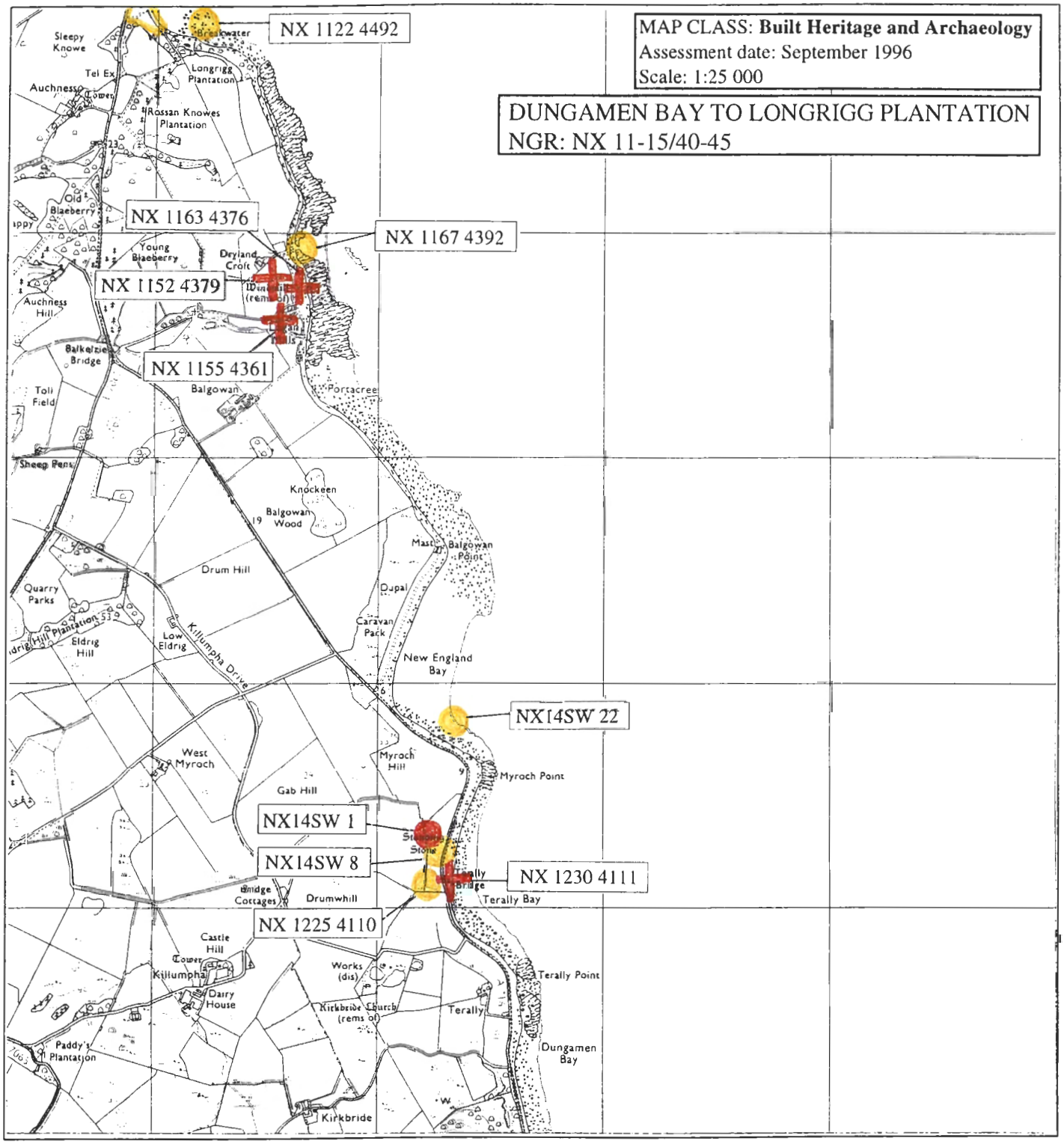
NX 1155 4361
LOGAN MILL
Sawmill
Statutory Listed Building
Early 19th century
Good
Nil

NX 1163 4376
LOGAN MILL
Fishing Store & Boat Shed
Statutory Listed Building
Late 19th century
Good
Nil

NX 1152 4379
LOGAN MILL
Windmill
Statutory Listed Building
17th century
Good
Nil

MAP CLASS: **Built Heritage and Archaeology**
Assessment date: September 1996
Scale: 1:25 000

DUNGAMEN BAY TO LONGRIGG PLANTATION
NGR: NX 11-15/40-45



KEY

Site location	Symbol	Colour	Significance
NGR ref. - eg. NX 143 368	Roundel - Solid, (or area)	Red	Protected Ancient Monument
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	Roundel - Solid, (or area)	Yellow	Other known Ancient Monument
NMRS ref. - eg. NX13 SW17	Dashed outline	Yellow	Gardens/Designed landscape
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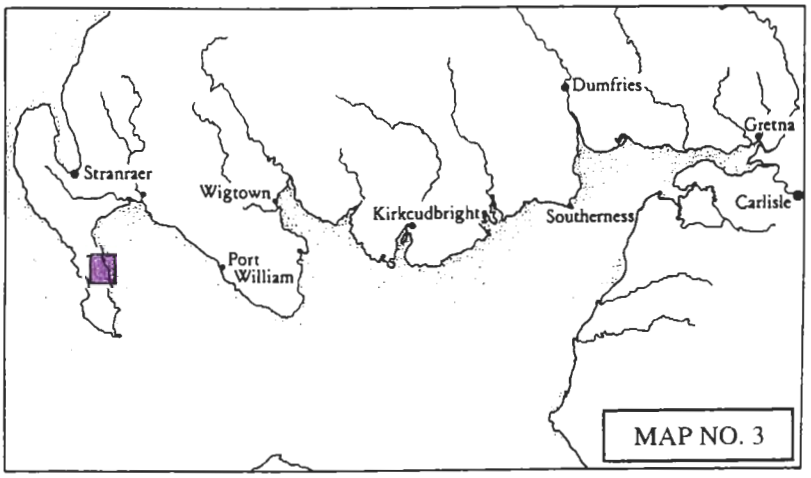

MAP 4: CHAPEL ROSSEN TO SANDHEAD

Hinterland Geology and Coastal Geomorphology: The hinterland geology is the same as that on the preceding map. Raised beach deposits commonly of sand and shingle and gravel occur from Chapel Rossan Bay (Unit 1) to Clay Hill (NX 018 460). In parts these form crescent shaped ridges. Fluvioglacial gravel are recorded at Alwhibbie Bridge and Sandhead Bay. The foreshore up to Sandhead Bay is mainly sand with shingle banked at the HWM. Poorly sorted boulders and sand bars occur between the HWM and LWMS intertidal zone.

Erosion Class: An extensive concrete sea walls protects a public road at Chapel Rossan Bay and Alwhibbie Bridge. Chapel Rossan bay is stable. The coastline beyond this point is eroding or stable and prone to scouring and wave induced mass-movement. This is giving rise to bare patches of sand. However shingle banks at the HWM are affording some stability for much of this region of coastline.

Built Heritage & Archaeology: The archaeology of this section is thinly distributed and consists solely of eighteenth, nineteenth and twentieth century monuments. These include fishing stakes and a boat noost on the foreshore, and a dyemill, gardens and an inscribed slab in the hinterland. None of the sites is threatened with the exception of the boat noost at Sandhead Bay (NX 1024 4888) which is suffering from tidal abrasion.

Map 4: Hinterland Geology and Coastal Geomorphology

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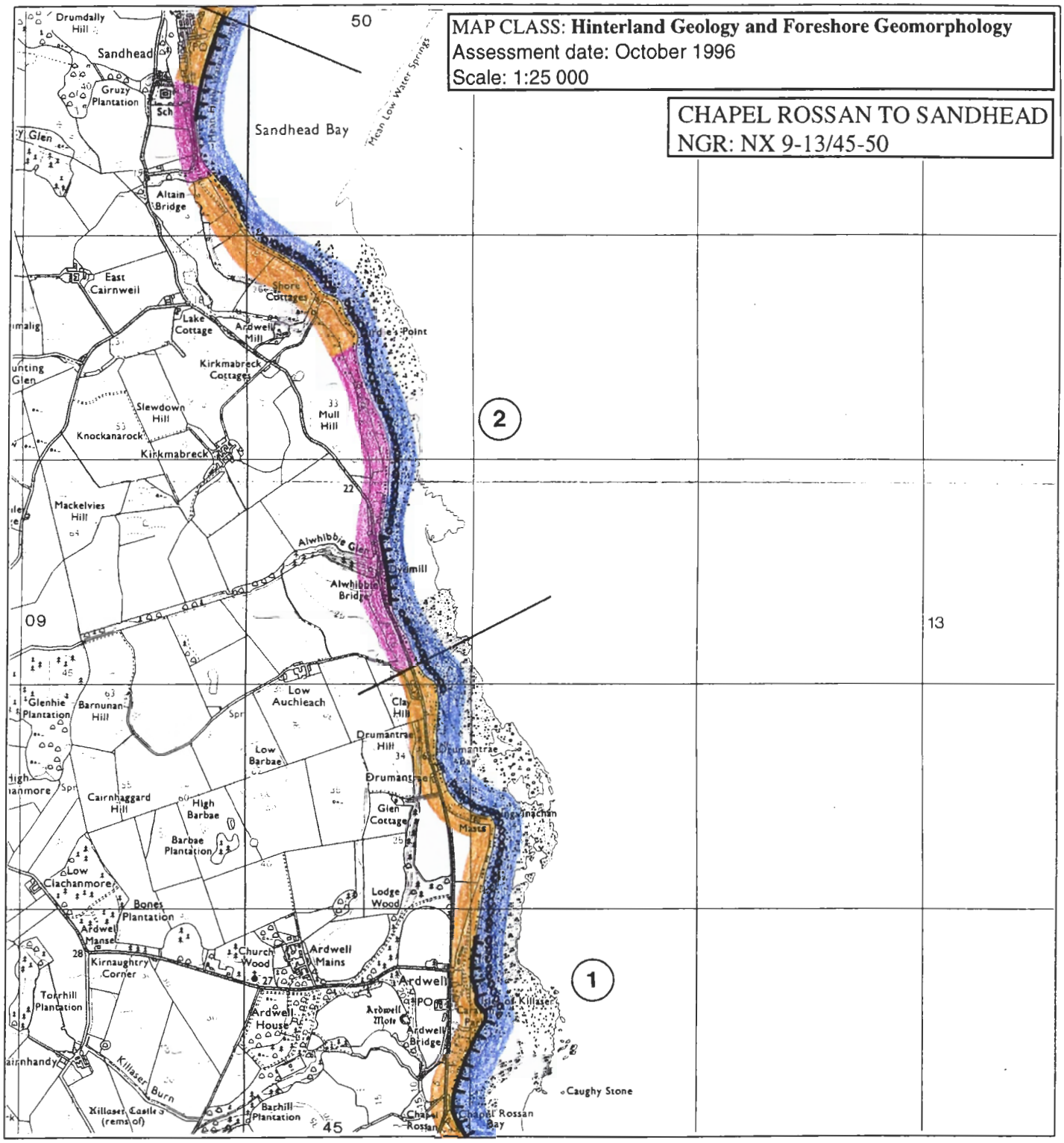
1. LONGRIGG PLANTATION to north of CLAYHILL
NX 110 464
2.5km
Cliff (< 5m)
Raised beach and marine drift
This unit contains Chapel Rossan and Drumantrae Bay . The hinterland behind these features are marine derived raised beach deposits.

2. CLAYHILL to SANDHEAD BAY
NX 104 485
0.3km
Cliff (< 5m)
Mainly raised beach and glacial sand
The foreshore consists of sand and poorly sorted boulders intermixed with areas of clean sand. The hinterland comprises glacial sands and gravels with raised beaches present towards Sandhead Bay.

MAP CLASS: **Hinterland Geology and Foreshore Geomorphology**
Assessment date: October 1996
Scale: 1:25 000

CHAPEL ROSSAN TO SANDHEAD
NGR: NX 9-13/45-50



KEY

Hinterland Geology	Derwent Code	Colour
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Drift, boulder clay over visible rock	Dark Violet	
Raised beach and marine deposits	Golden Brown	
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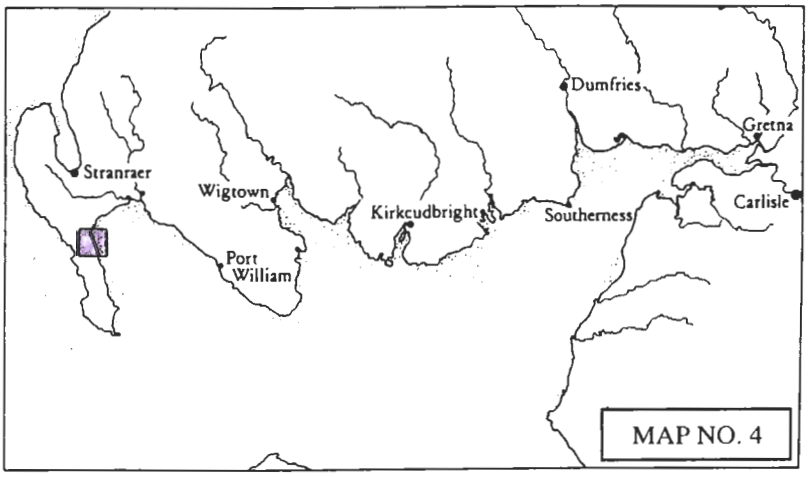
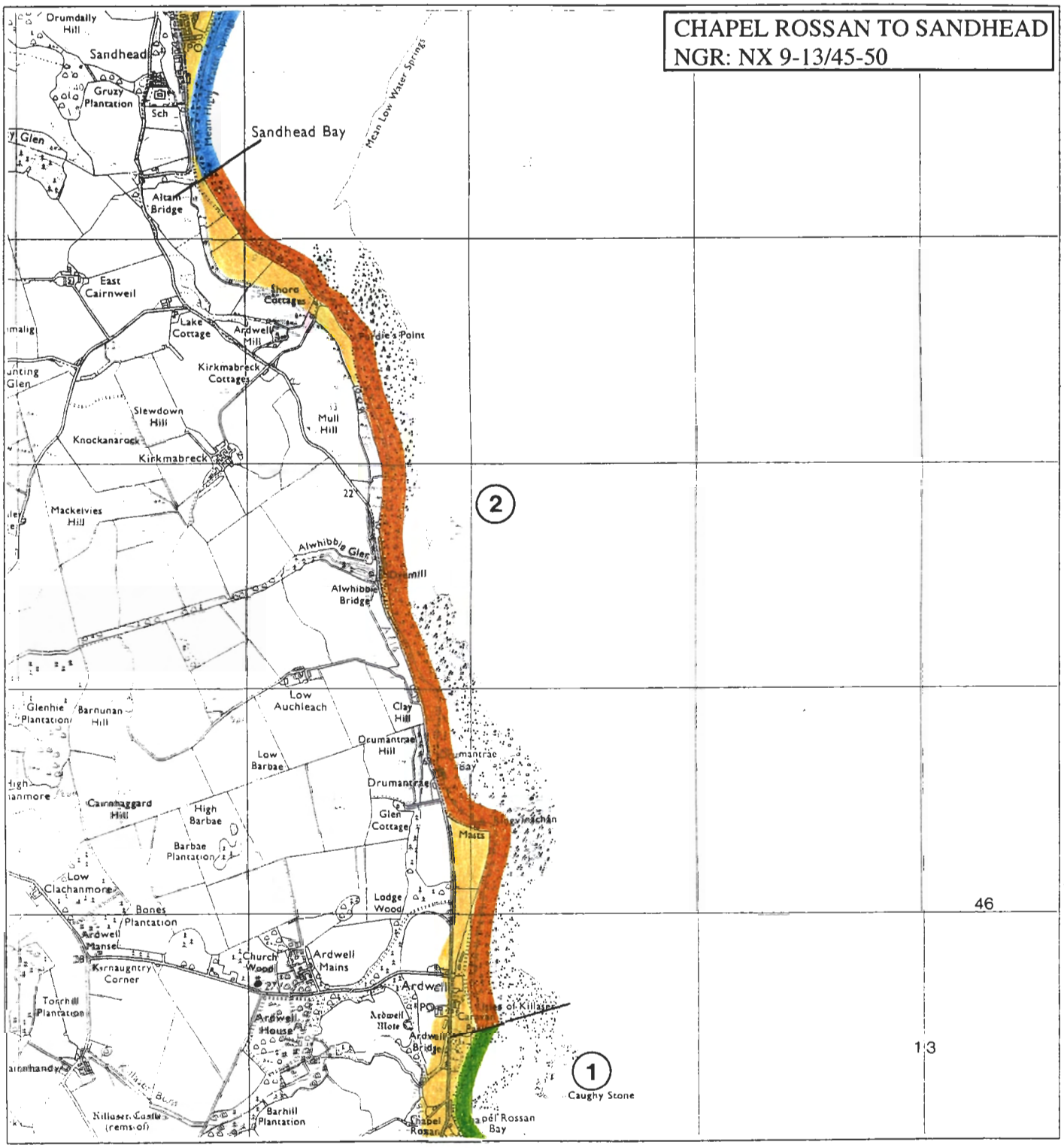
Glacial sand and gravel	Magenta	
Alluvium	Emerald Green	
Coastal Geomorphology		
Mainly rock platform	Deep vermilion	
Mainly sand	Ultramarine	
Mainly alluvial/marine mud	Venetian Red	
Marsh	May Green	
Coast Edge		
Low edge (<5m)	Thin black line	
Cliff (>5m)	Solid black line	
Man made barrier	Black line with spines	
Shingle beach	Small circles	
Human disturbance	Black carats	



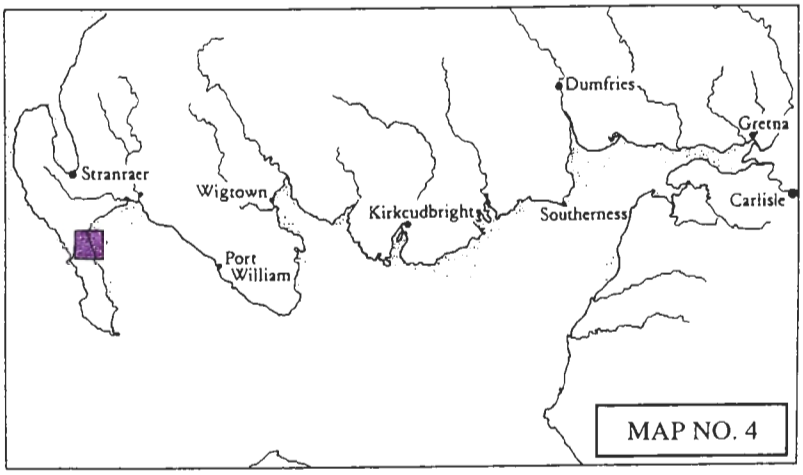
CHAPEL ROSSAN TO SANDHEAD
NGR: NX 9-13/45-50



KEY

Erosion class	Derwent Code	Colour
Definitely accreting	Prussian Blue	
Accreting/stable	Light Blue	
Stable	Grass Green	
Stable/eroding	Deep Chrome	
Definitely eroding	Deep Vermilion	
Both accreting and eroding	Imperial Purple	
No access	Blank	
Land below 10m	Straw Yellow	

MAP CLASS: **EROSION**
Assessment date: 23.9.96
Scale 1:25 000



MAP 4: BUILT HERITAGE AND ARCHAEOLOGY

Sites on the Coast & Foreshore

NX 1024 4888
SANDHEAD BAY
Boat Noost
Uncertain
Fair
Monitor

NX 0988 4930
SANDHEAD BAY
Fishing Net Stakes
Uncertain
Good
Nil

Sites in the Hinterland

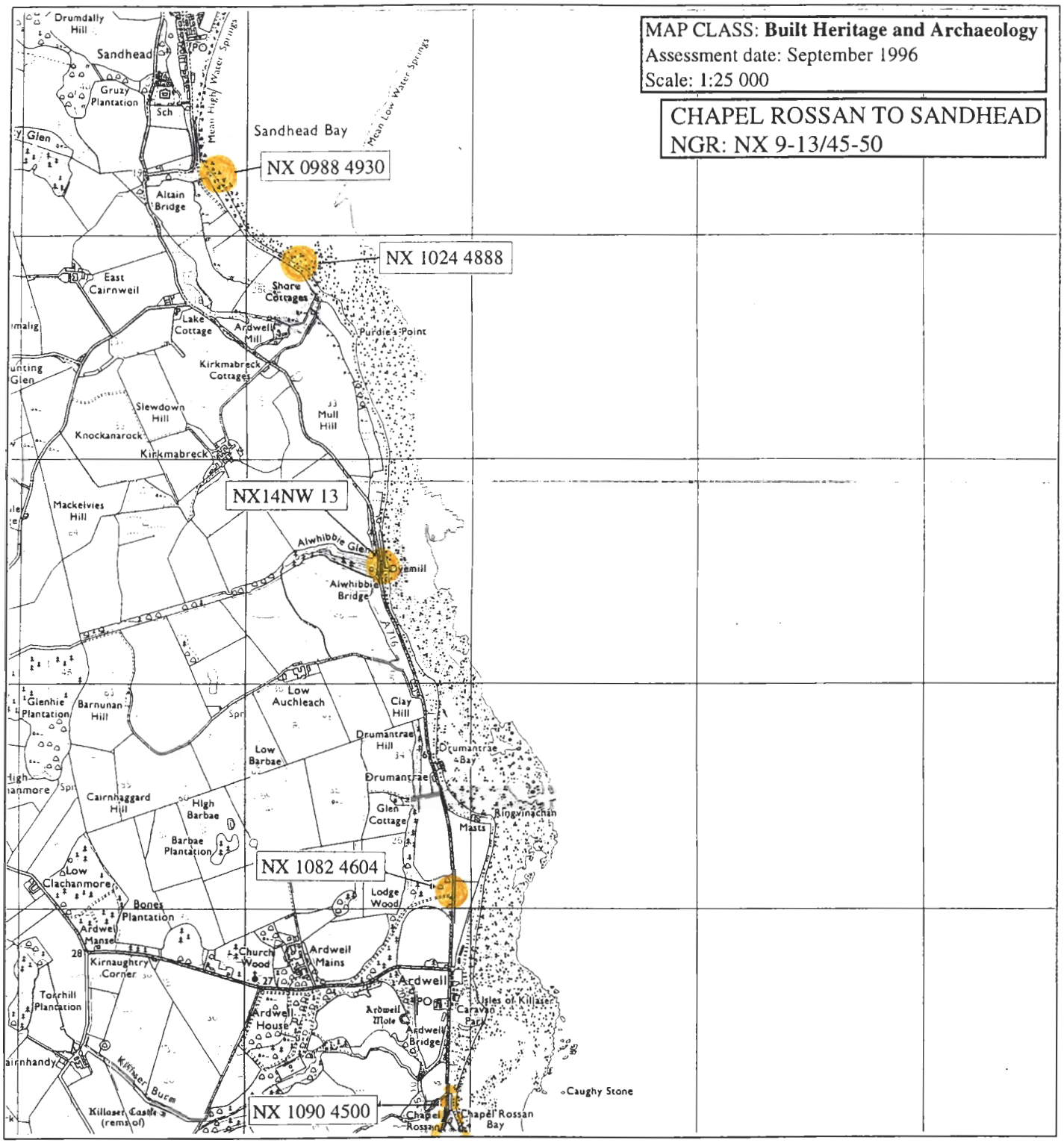
NX 1090 4500
ARDWELL HOUSE
Gardens
18/19/20th centuries
Good
Nil

NX 1082 4604
LODGE HOUSE, ARDWELL MAINS
"Murder" Stone Slab
18/19th century
Good
Nil

NX14NW 13
NX 1059 4751
ALWHIBBLE
Dyemill
18/19th century
Good
Nil

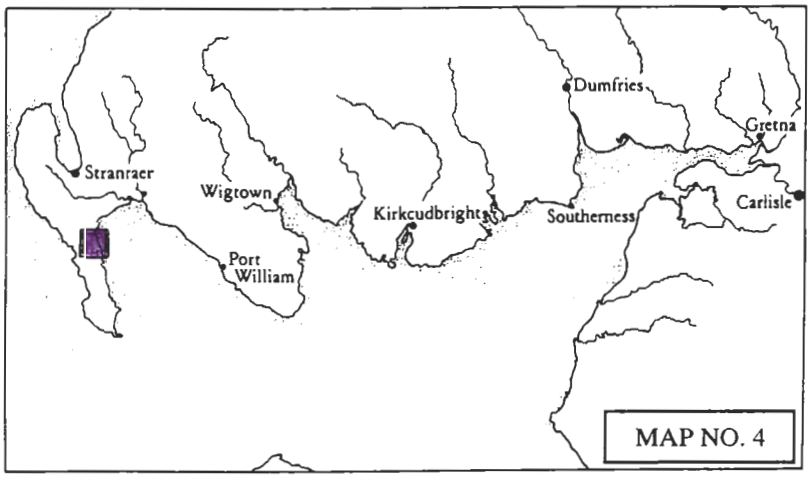
MAP CLASS: **Built Heritage and Archaeology**
Assessment date: September 1996
Scale: 1:25 000

CHAPEL ROSSAN TO SANDHEAD
NGR: NX 9-13/45-50



KEY

Site location	Symbol	Colour	Significance
NGR ref. - eg. NX 143 368	Roundel - Solid, (or area)	Red	Protected Ancient Monument
	Cross	Red	Listed Historic Building
	Roundel - Open, (or area)	Red	Monument formally proposed by Historic Scotland for designation
	Roundel - Solid, (or area)	Yellow	Other known Ancient Monument
NMRS ref. - eg. NX13 SW17	Dashed outline	Yellow	Gardens/Designed landscape
	Roundel - Solid, (or area)	Yellow	Undesignated wreck
	Area	Green	Insufficient information; more work needed
	Area	Blue	Probably archaeologically sterile



MAP 5: SANDHEAD TO WEST FREUGH

Hinterland Geology and Coastal Geomorphology: The hinterland geomorphology at this particular region of the coast is dominated by marine deposits. At the village of Sandhead the backshore region is flat and consists of sand and shingle. This gives way to a well developed 'hindshore' dune system known as Torrs Warren (designated as a SSSI) at the head of Luce Bay. A series of ridged dunes overlook a wide sandy beach.

Erosion Class: The foreshore at Sandhead village is accreting and stable as shingle is banked up at the HWM. Towards Sandmill Farm (Unit 2) the beach is stable. East of Clayshant the dunes overlooking the beach are suffering from minor erosion due to the outflow of a small burn. Single and Hanson (1994) mention that the dune system is exceptionally stable over most of the area owing to near continuous vegetation cover and the removal of livestock. However, blow-out caused by rabbit colonisation could promote erosion of the dunes facing the sea.

Built Heritage & Archaeology: Only one archaeology site is situated in this section. It is a mid-twentieth century bombing target and is not threatened.

Map 5: Hinterland Geology and Coastal Geomorphology

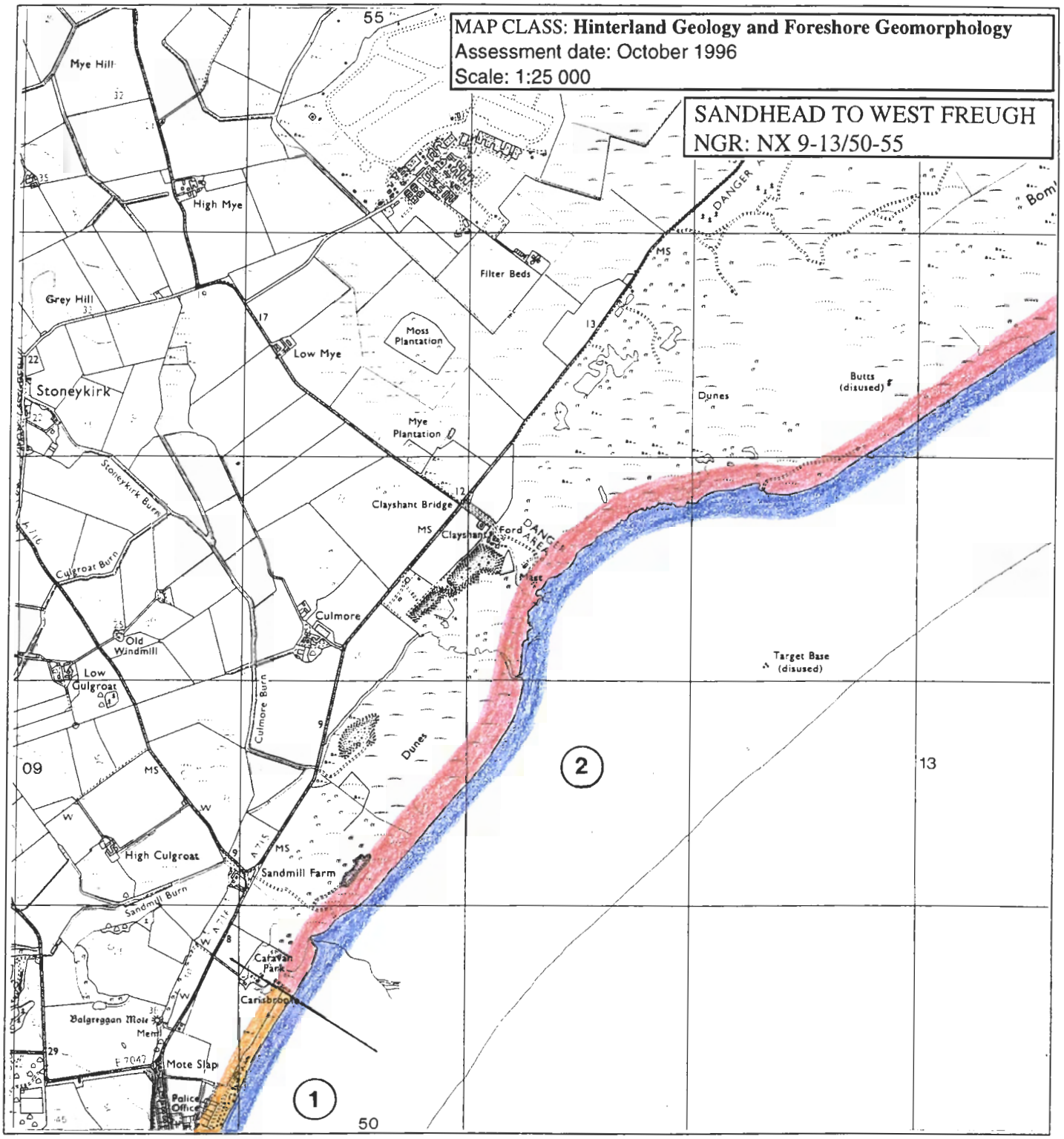
---

1. SANDHEAD to CARISBROOKE CARAVAN PARK
NX 210 505
0.5km
Low edge (< 5m)
Mainly marine sands and gravels
Marine derived sands and gravels consolidated by grass banks. The foreshore is mainly sand and poorly sorted pebbles and shingle.

2. LUCE SANDS M.O.D. FIRING RANGE
NX 142 542
9km
Low edge (< 5m)
Sand dunes
The head of Luce Bay is a well formed 'hindshore' dune system with crescent shaped sand ridges. The foreshore is a sand with shingle in parts.

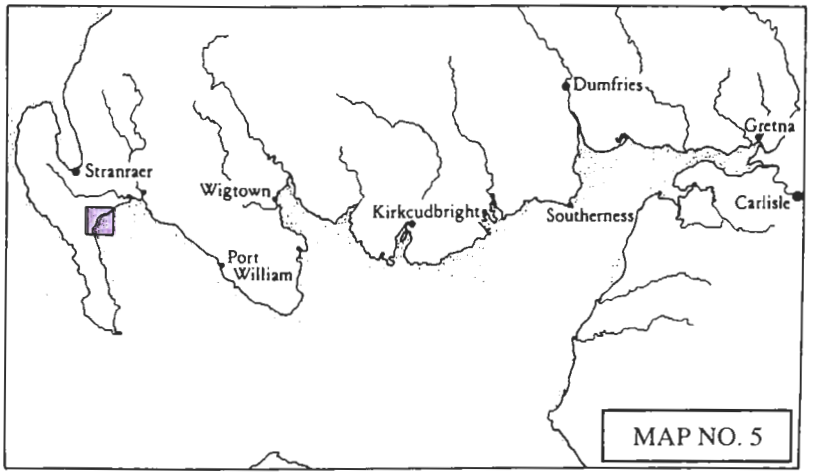
MAP CLASS: **Hinterland Geology and Foreshore Geomorphology**
Assessment date: October 1996
Scale: 1:25 000

SANDHEAD TO WEST FREUGH
NGR: NX 9-13/50-55



KEY

Hinterland Geology	Derwent Code	Colour
Drift, boulder clay	French Grey	
Drift, boulder clay over visible rock	Dark Violet	
Raised beach and marine deposits	Golden Brown	
Blown sand	Pink Madder Lake	
Glacial sand and gravel	Magenta	
Alluvium	Emerald Green	
Coastal Geomorphology		
Mainly rock platform	Deep vermilion	
Mainly sand	Ultramarine	
Mainly alluvial/marine mud	Venetian Red	
Marsh	May Green	
Coast Edge		
Low edge (<5m)	Thin black line	
Cliff (>5m)	Solid black line	
Man made barrier	Black line with spines	
Shingle beach	Small circles	
Human disturbance	Black carats	



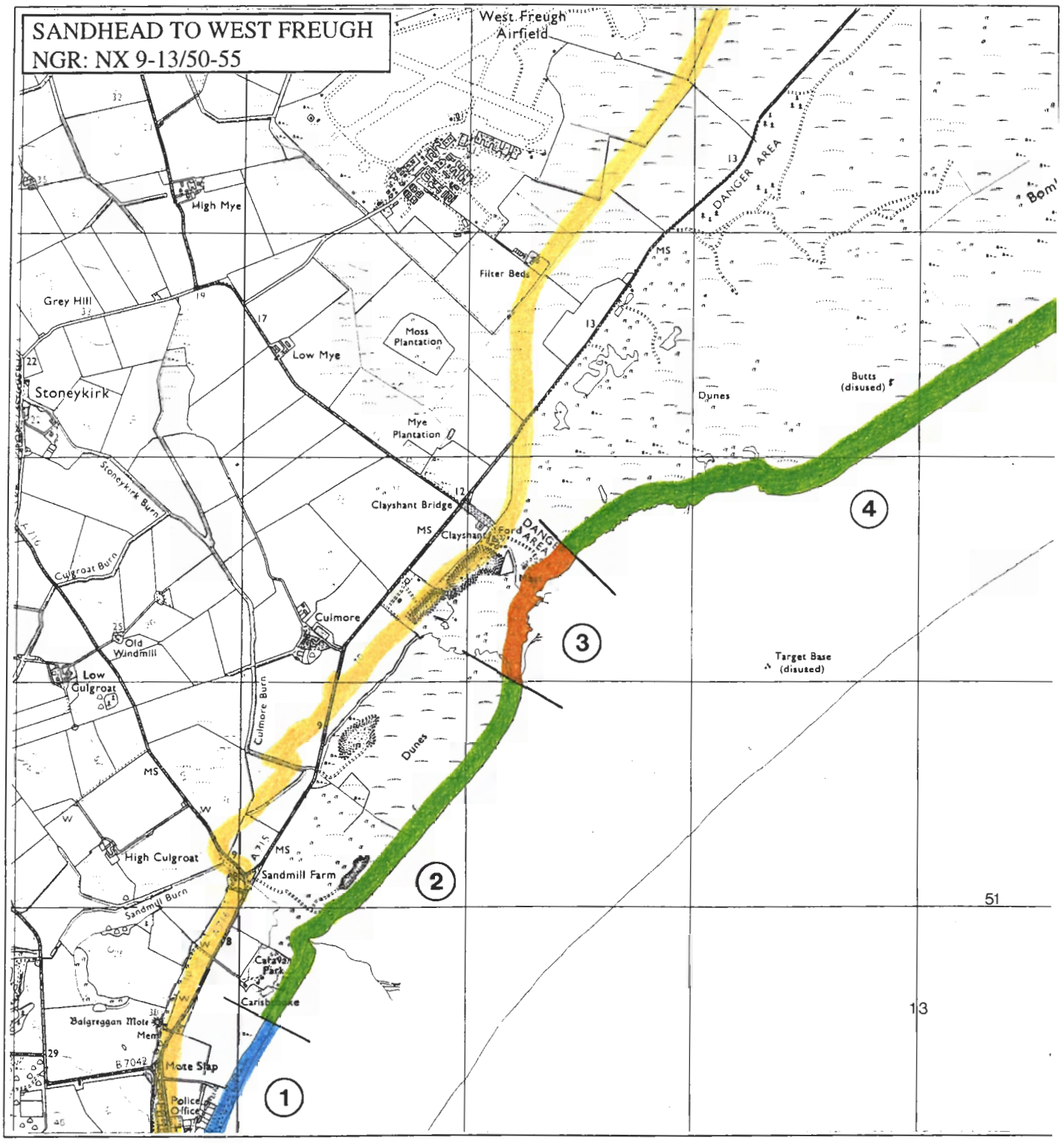
MAP 5: EROSION

1. SANDHEAD BAY to CARISBROOKE
NX 210 303
1.2km
Accreting or stable
This unit appears to be stable with accretion of shingle against a grassy foreshore.

2. CARISBROOKE to south of CLAYSHANT FORD
NX 211 516
1.8km
Stable
This unit forms part of the western reach of Luce Sands and consists of a fairly wide intertidal zone (c.0.8km) of sand. The backshore region consists of vegetated sand dunes.

3. CLAYSHANT
NX 113 524
0.5km
Eroding or stable
This unit consists of sand dunes that are eroding due deflation and water erosion from a burn that flows past Clayshant farm. The loss of sand in the backshore region appears to be severe in parts.

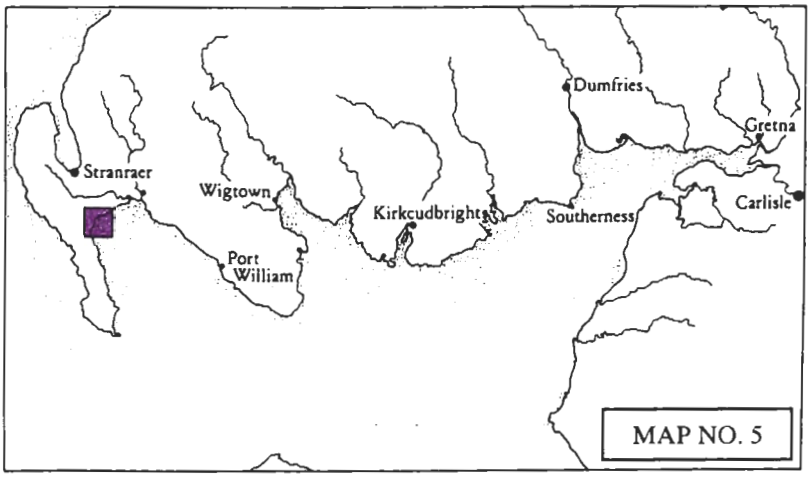
4. CLAYSHANT to RINGDOO SANDS
NX 140 540
7.5km
Stable
This unit forms the head of Luce Sands and is a fairly uniform stretch of coastline comprising stable sandunes stabilised by dense bracken and heather. The wide intertidal zone is sandy and boulder free.



KEY

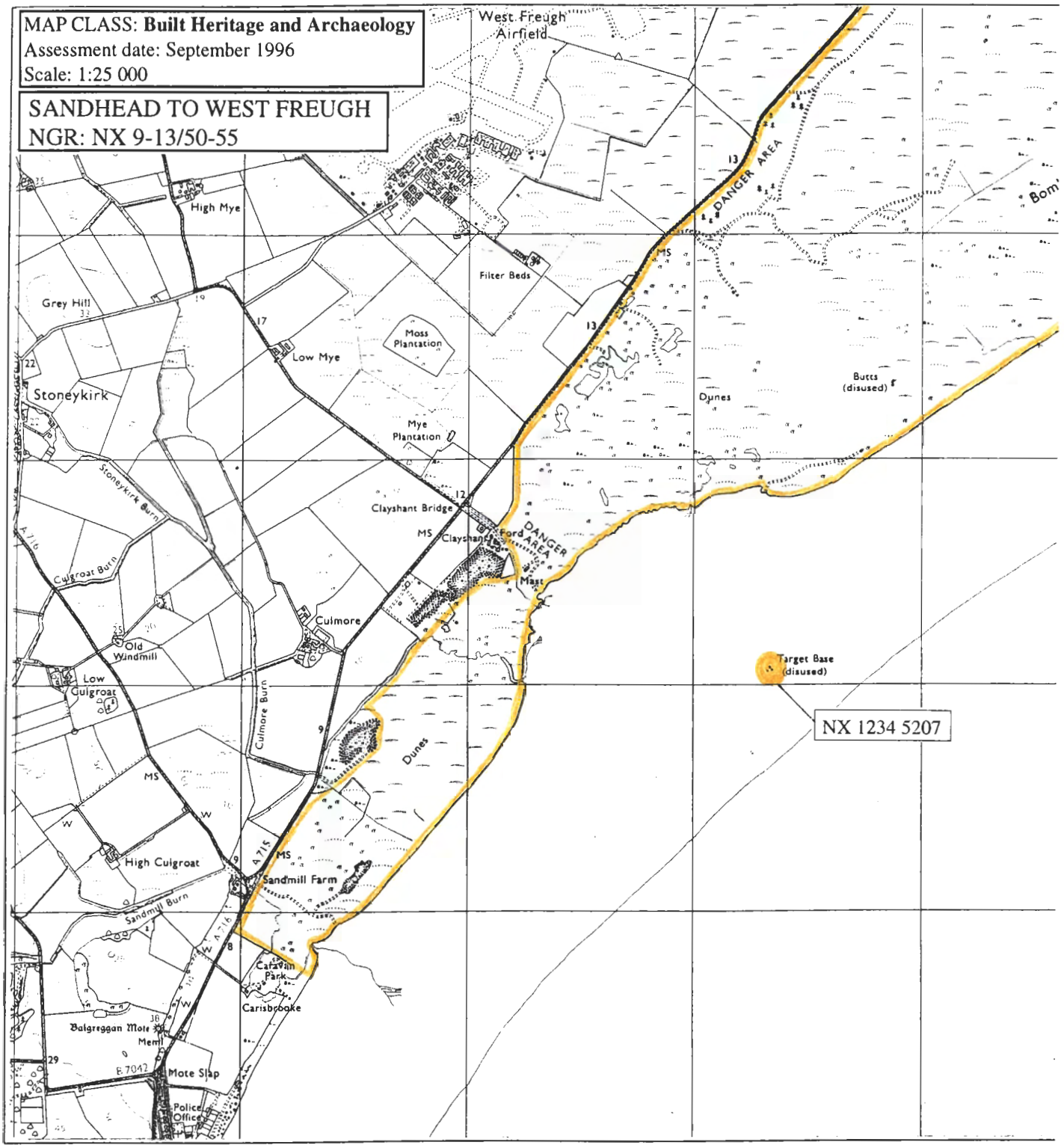
Erosion class	Derwent Code	Colour
Definitely accreting	Prussian Blue	
Accreting/stable	Light Blue	
Stable	Grass Green	
Stable/eroding	Deep Chrome	
Definitely eroding	Deep Vermilion	
Both accreting and eroding	Imperial Purple	
No access	Blank	
Land below 10m	Straw Yellow	

MAP CLASS: **EROSION**
Assessment date: 17.9.96
Scale 1:25 000



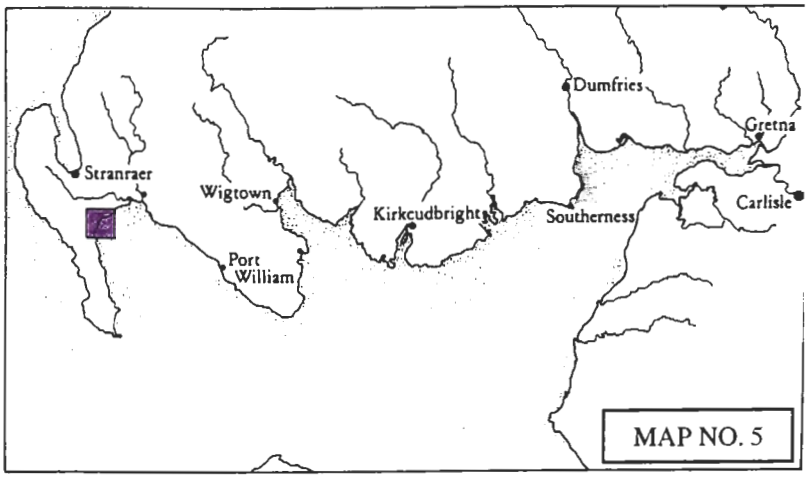
MAP 5: BUILT HERITAGE AND ARCHAEOLOGY

Sites on the Coast & Foreshore	Sites in the Hinterland
NX 1234 5207 LUCE SANDS Disused Target Base Uncertain Good Nil	None



KEY

Site location	Symbol	Colour	Significance
NGR ref. - eg. NX 143 368	Roundel - Solid, (or area)	Red	Protected Ancient Monument
	Cross	Red	Listed Historic Building
	Roundel - Open, (or area)	Red	Monument formally proposed by Historic Scotland for designation
	Roundel - Solid, (or area)	Yellow	Other known Ancient Monument
NMRS ref. - eg. NX13 SW17	Dashed outline	Yellow	Gardens/Designed landscape
	Roundel - Solid, (or area)	Yellow	Undesignated wreck
	Area	Green	Insufficient information; more work needed
	Area	Blue	Probably archaeologically sterile



MAP 6: WEST FREUGH TO WHITECROOK

Hinterland Geology and Coastal Geomorphology: This region of the coast is a continuation of the long sand dune system of Torrs Warren shown on the previous map. The dune system ends at Ringdoo Sands where the Piltanton Burn flows into Luce Bay. The edge of the burn is dominated by salt and brackish marsh vegetation. The intertidal area in front of the dunes consists of a wide sandy beach known as Luce Sands.

Erosion Class: No erosion was recorded on this stretch of the dunes and conditions are considered to be stable. From Rigdoo Sands to Whitecrook (Unit 2), (via Piltanton Bridge) the banks along burn are eroding only slowly due to the density of marsh vegetation.

Built Heritage & Archaeology: The archaeology of this section includes a range of prehistoric, early historic and medieval sites and findspots located in the extensive sand dune system of Torrs Warren. At the moment the dune system is under thick vegetation and is thus extremely stable, with only a few isolated spots of exposed sand, due to rabbit action, open to wind erosion. Many of the sites represent chance findspots, poorly provenanced (Williams, 1977, 77) and are only located to a four figure grid reference.

Map 6: Hinterland Geology and Coastal Geomorphology

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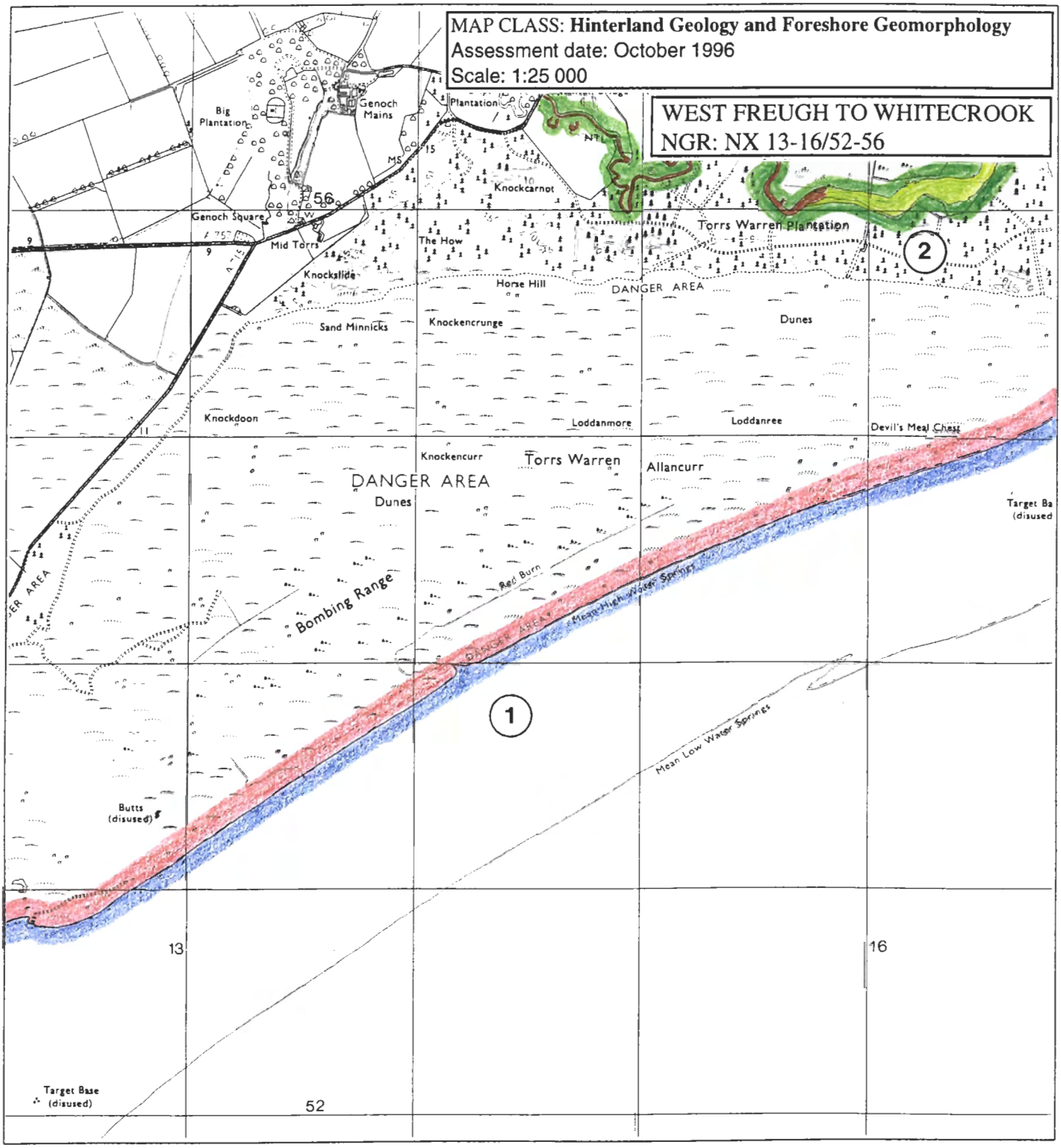
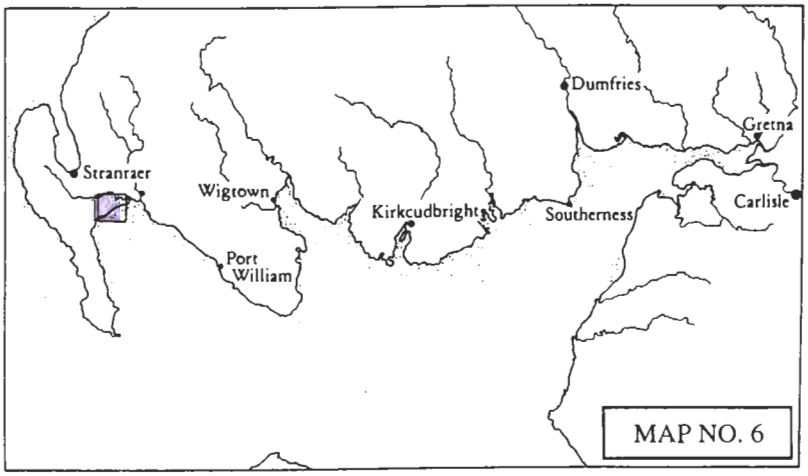
1. LUCE SANDS M.O.D. FIRING RANGE
NX 142 542
9km
Low edge (< 5m)
Sand dunes
The head of Luce Bay is a well formed 'hindshore' dune system with crescent shaped sand ridges. The foreshore is a sand with shingle in parts.

2. RINGDOO SANDS to south of WHITE CROOK FARM
NX 142 542
1km
Low edge (< 5m)
Saltmarsh backed by sand dunes
Sheltered mouth of the Pitanton Burn. Alluvium underlies saltmarsh with a planted frontal sand dune system in the hinterland.



KEY

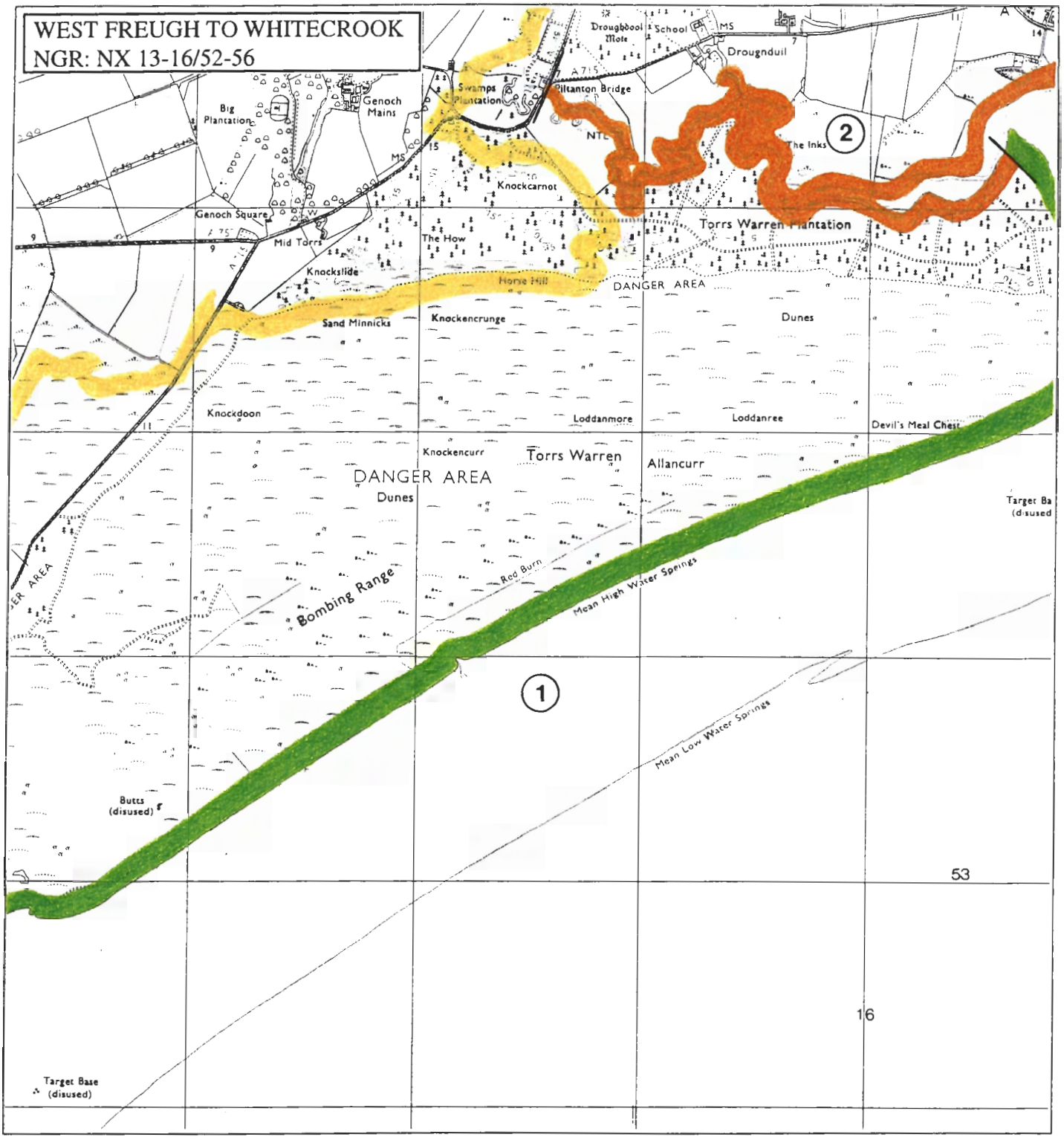
Hinterland Geology	Derwent Code	Colour
Drift, boulder clay	French Grey	
Drift, boulder clay over visible rock	Dark Violet	
Raised beach and marine deposits	Golden Brown	
Blown sand	Pink Madder Lake	
Glacial sand and gravel	Magenta	
Alluvium	Emerald Green	
Coastal Geomorphology		
Mainly rock platform	Deep vermilion	
Mainly sand	Ultramarine	
Mainly alluvial/marine mud	Venetian Red	
Marsh	May Green	
Coast Edge		
Low edge (<5m)	Thin black line	
Cliff (>5m)	Solid black line	
Man made barrier	Black line with spines	
Shingle beach	Small circles	oooooo
Human disturbance	Black carats	^^^^^^



MAP 6: EROSION

4. CLAYSHANT to RINGDOO SANDS
NX 140 540
7.5km
Stable
This unit forms the head of Luce Sands and is a fairly uniform stretch of coastline comprising stable sand dunes stabilised by dense bracken and heather. The wide intertidal zone is sandy and boulder free.

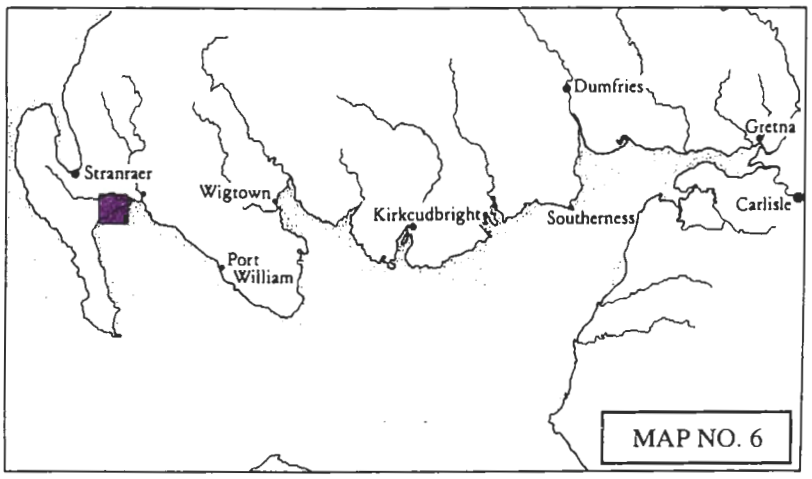
2. RINGDOO SANDS to PILTANTON BRIDGE
NX 160 560
4km
Eroding or stable (estimate only)
The lower tidal stretch and upper reach of the Piltanton Burn could not be surveyed due to the dangerous and boggy nature of the marsh.



KEY

Erosion class	Derwent Code	Colour
Definitely accreting	Prussian Blue	
Accreting/stable	Light Blue	
Stable	Grass Green	
Stable/eroding	Deep Chrome	
Definitely eroding	Deep Vermilion	
Both accreting and eroding	Imperial Purple	
No access	Blank	
Land below 10m	Straw Yellow	

MAP CLASS: **EROSION**
Assessment date: 17.9.96
Scale 1:25 000



MAP 6: BUILT HERITAGE AND ARCHAEOLOGY

Sites on the Coast & Foreshore

None

Sites in the Hinterland

NX15SW 3
NX 1 5
LUCE SANDS
Bronze axe, pottery, flints & miscellaneous finds spots
3rd Mill. BC onwards
Uncertain; not located
Nil

NX15SW 13
NX 1 5
LUCE SANDS
Roman Key Findspot
2nd century AD
Uncertain; not located
Nil

NX15SW 16
NX 1 5
LUCE SANDS
Roman Coin Findspot
4th century AD
Uncertain; not located
Nil

NX15SW 24
NX 1 5
LUCE SANDS
Pottery & Flints
2nd Mill. BC
Uncertain; not located
Nil

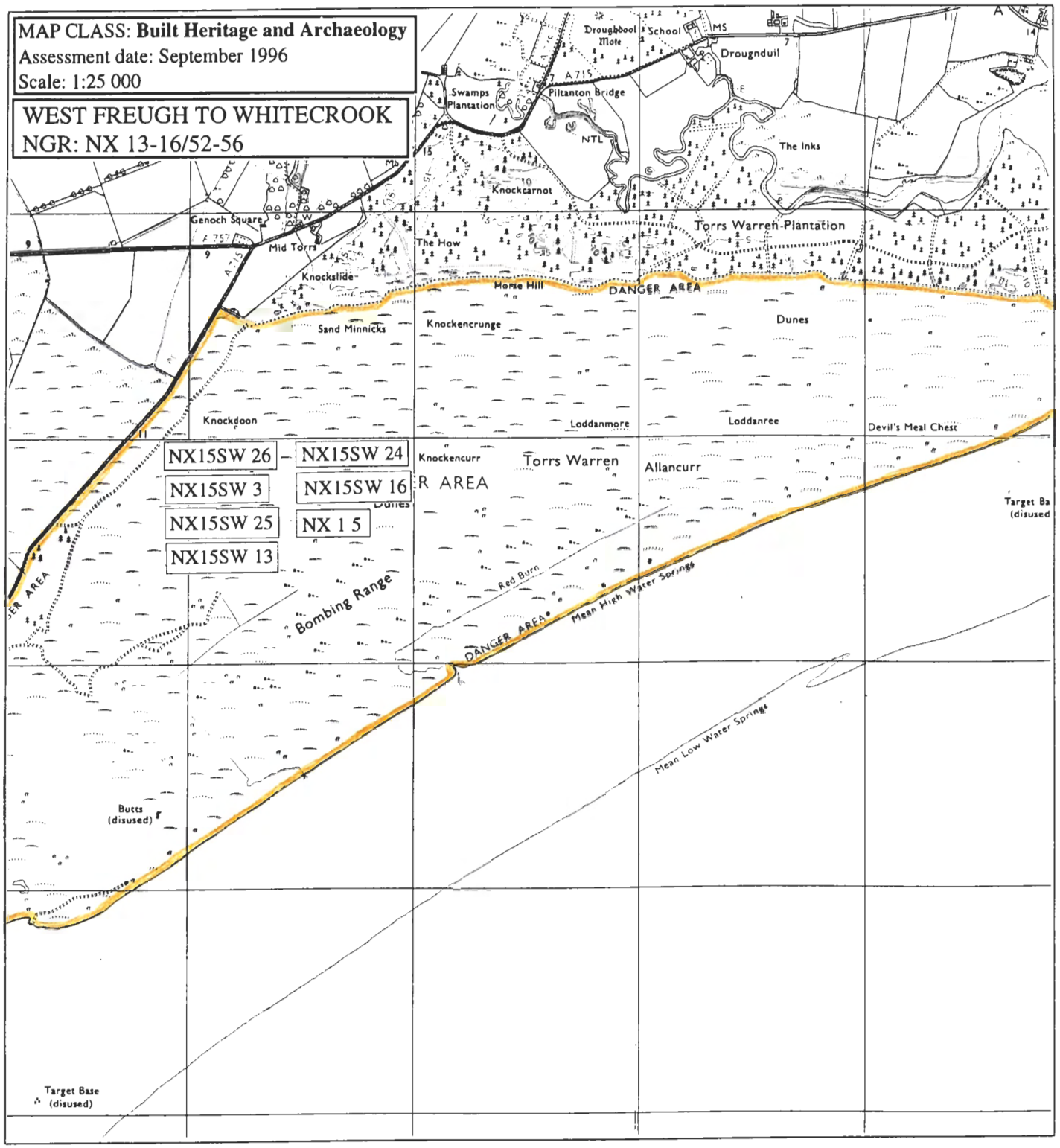
NX15SW 25
NX 1 5
LUCE SANDS
Bronze Brooch
Uncertain
Uncertain; not located
Nil

NX15SW 26
NX 1 5
LUCE SANDS
Bronze Pin
5 & 6th centuries AD
Uncertain; not located
Nil

NX 1 5
LUCE SANDS
Mortuary Structure
Uncertain
Uncertain; not located
Nil

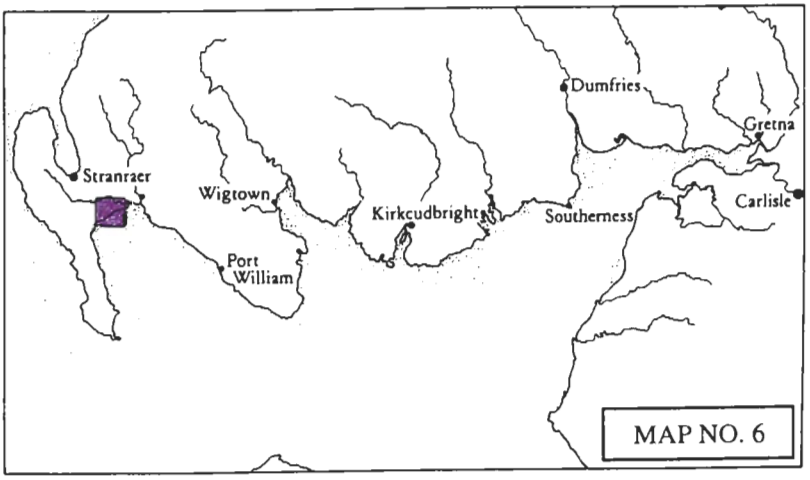
MAP CLASS: **Built Heritage and Archaeology**
Assessment date: September 1996
Scale: 1:25 000

WEST FREUGH TO WHITECROOK
NGR: NX 13-16/52-56



KEY

Site location	Symbol	Colour	Significance
NGR ref. - eg. NX 143 368	Roundel - Solid, (or area)	Red	Protected Ancient Monument
	Cross	Red	Listed Historic Building
	Roundel - Open, (or area)	Red	Monument formally proposed by Historic Scotland for designation
NMRS ref. - eg. NX13 SW17	Roundel - Solid, (or area)	Yellow	Other known Ancient Monument
	Dashed outline	Yellow	Gardens/Designed landscape
	Roundel - Solid, (or area)	Yellow	Undesignated wreck
	Area	Green	Insufficient information; more work needed
	Area	Blue	Probably archaeologically sterile



MAP 7 DROUGNDIL TO KILFILLAN POINT

Hinterland Geology and Coastal Geomorphology: This section of the coastline alters from a region dominated dune systems to the start of the eastern side of Luce Bay. From Whitecrook to St Helena Island the coastline is dominated by marine sands and gravels. These contain a beach that is a mixture of poorly sorted alluvial silts, sands and gravels derived from the Piltanton Burn. From St Helena to Ballingclach fluvioglacial sands and gravels outcrop alongside the Water of Luce.

Erosion Class: Between Whitecrook and St Helena Island the shoreline is very wide incised by river channels at low tide. The coastal edge however appears to be stable.

Built Heritage & Archaeology: See Map 6.

7: Hinterland Geology and Coastal Geomorphology

1. LUCE SANDS M.O.D. FIRING RANGE
NX 142 542
9km
Low edge (< 5m)
Sand dunes
The head of Luce Bay is a well formed 'hindshore' dune system with crescent shaped sand ridges. The foreshore is a sand with shingle in parts.

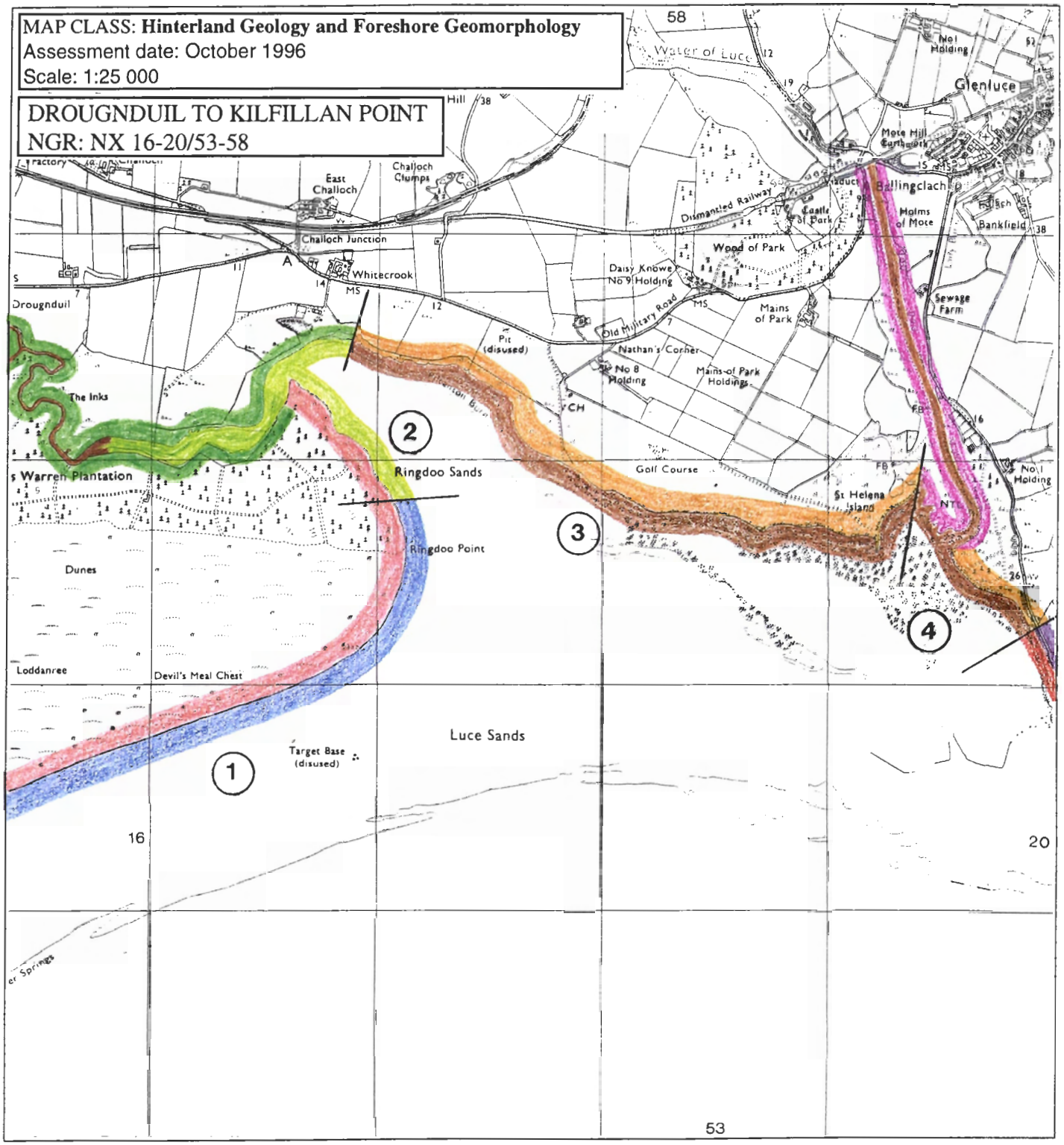
2. RINGDOO SANDS to south of WHITE CROOK FARM
NX 142 542
1km
Low edge (< 5m)
Saltmarsh backed by sand dunes
Sheltered mouth of the Pitanton Burn. Alluvium underlies saltmarsh with a planted frontal sand dune system in the hinterland.

3. South of WHITECROOK to St HELENA ISLAND
NX 182 558
3km
Low edge (< 5m)
Marine deposits
The hinterland includes a wide stretch of undulating marine sands and gravels. The low intertidal area contains a mixture of alluvium mud interspersed with sand/shingle and boulders.

4. St HELENA ISLAND to south of No.1 HOLDING
NX 195 560
2km
Low edge (< 5m)
Raised beach/sands and gravels/alluvium
Mouth of the Water of Luce. The river cuts along the Orlock Bridge Fault and consists of glacial sands and gravels with alluvial deposits along its banks. Undulating raised beach deposits make up the shore edge. The intertidal area is low and consists of clean sand and gravel beds.

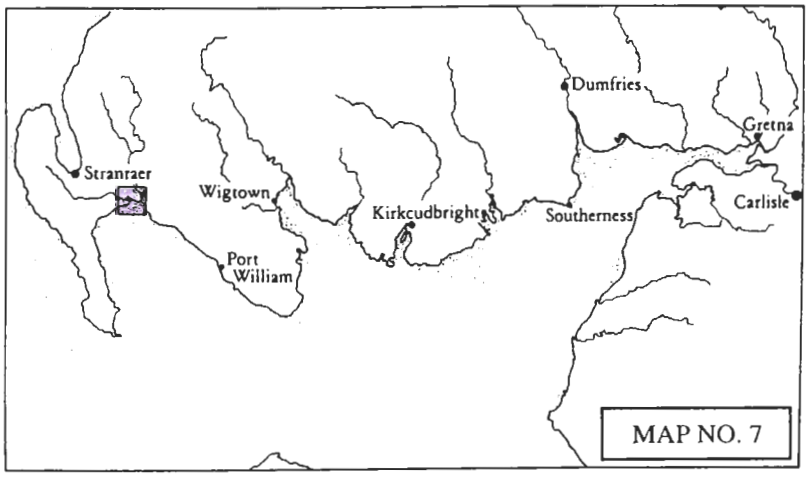
MAP CLASS: **Hinterland Geology and Foreshore Geomorphology**
Assessment date: October 1996
Scale: 1:25 000

DROUGNDUIL TO KILFILLAN POINT
NGR: NX 16-20/53-58



KEY

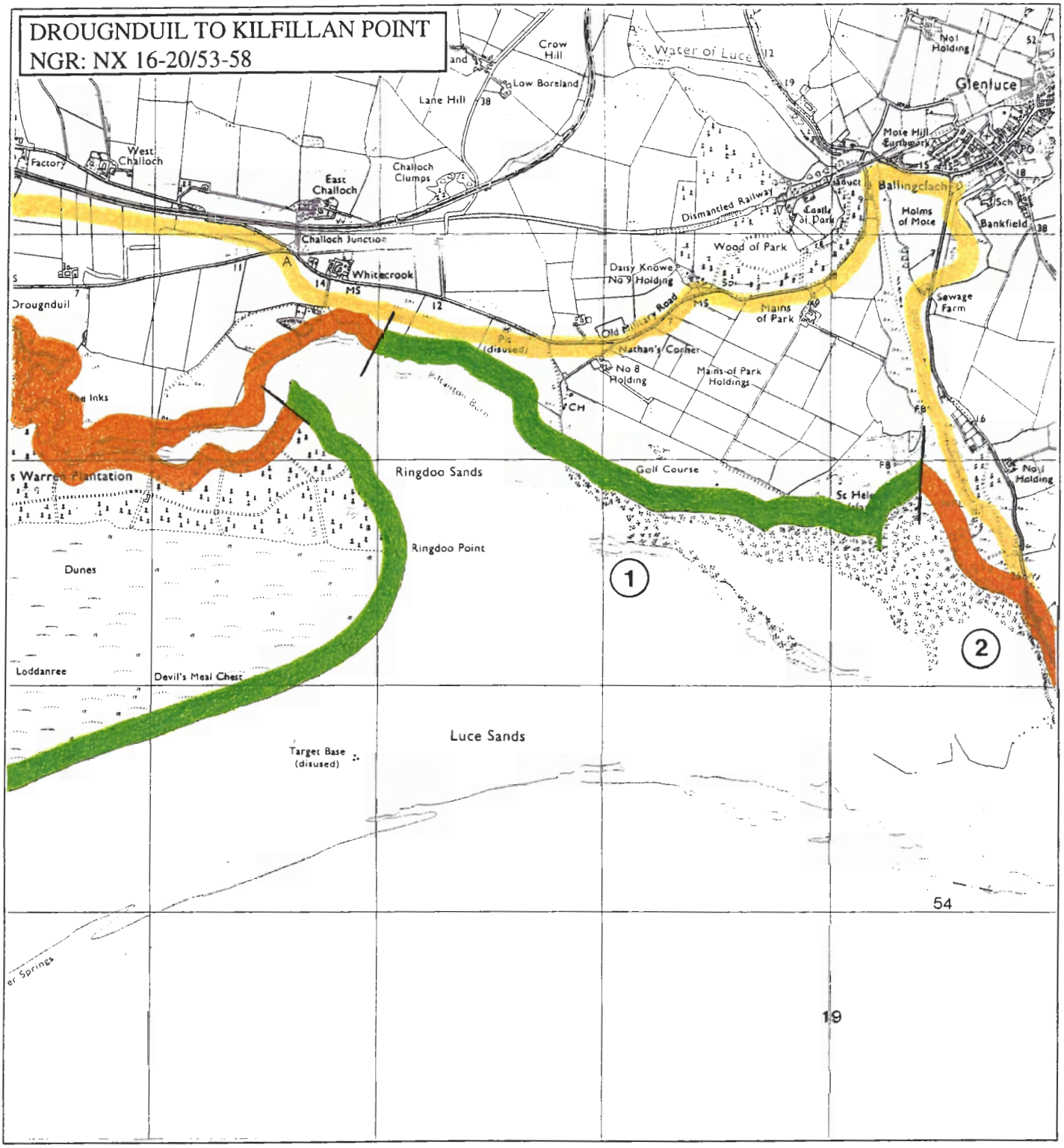
Hinterland Geology	Derwent Code	Colour
Drift, boulder clay	French Grey	
Drift, boulder clay over visible rock	Dark Violet	
Raised beach and marine deposits	Golden Brown	
Blown sand	Pink Madder Lake	
Glacial sand and gravel	Magenta	
Alluvium	Emerald Green	
Coastal Geomorphology		
Mainly rock platform	Deep vermilion	
Mainly sand	Ultramarine	
Mainly alluvial/marine mud	Venetian Red	
Marsh	May Green	
Coast Edge		
Low edge (<5m)	Thin black line	
Cliff (>5m)	Solid black line	
Man made barrier	Black line with spines	
Shingle beach	Small circles	oooooo
Human disturbance	Black carats	^^^^^^



MAP 7: EROSION

1. PILTANTON BURN to ST HELENA ISLAND
NX 180 559
2.5km
Eroding or stable
This unit consists of a wide intertidal area (c.1.km at MLWS) that is mainly sand and shingle. The foreshore margin in front of the dune system appears to be stable due to the density of the vegetation cover.

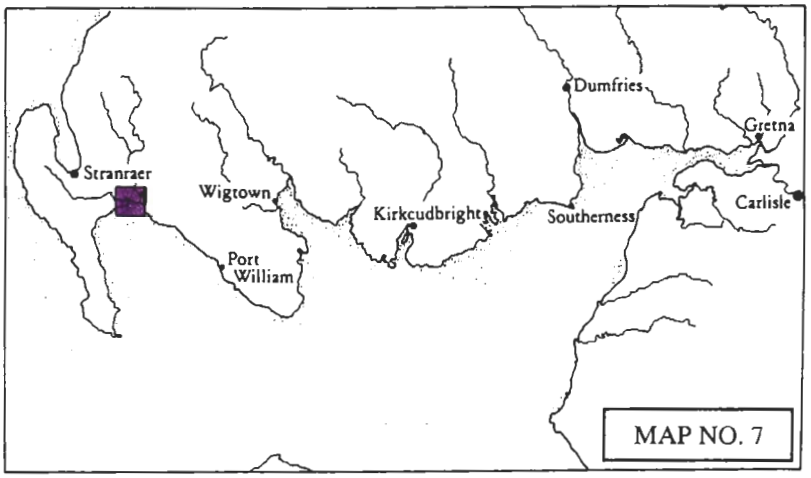
2. ST HELENA ISLAND to KILFILLAN POINT
NX 201 547
1.7km
Eroding or stable
This unit has an exposed south westerly aspect and contains an indented rocky shoreline with shingle at the HWM. This region appears to be eroding only slowly.



KEY

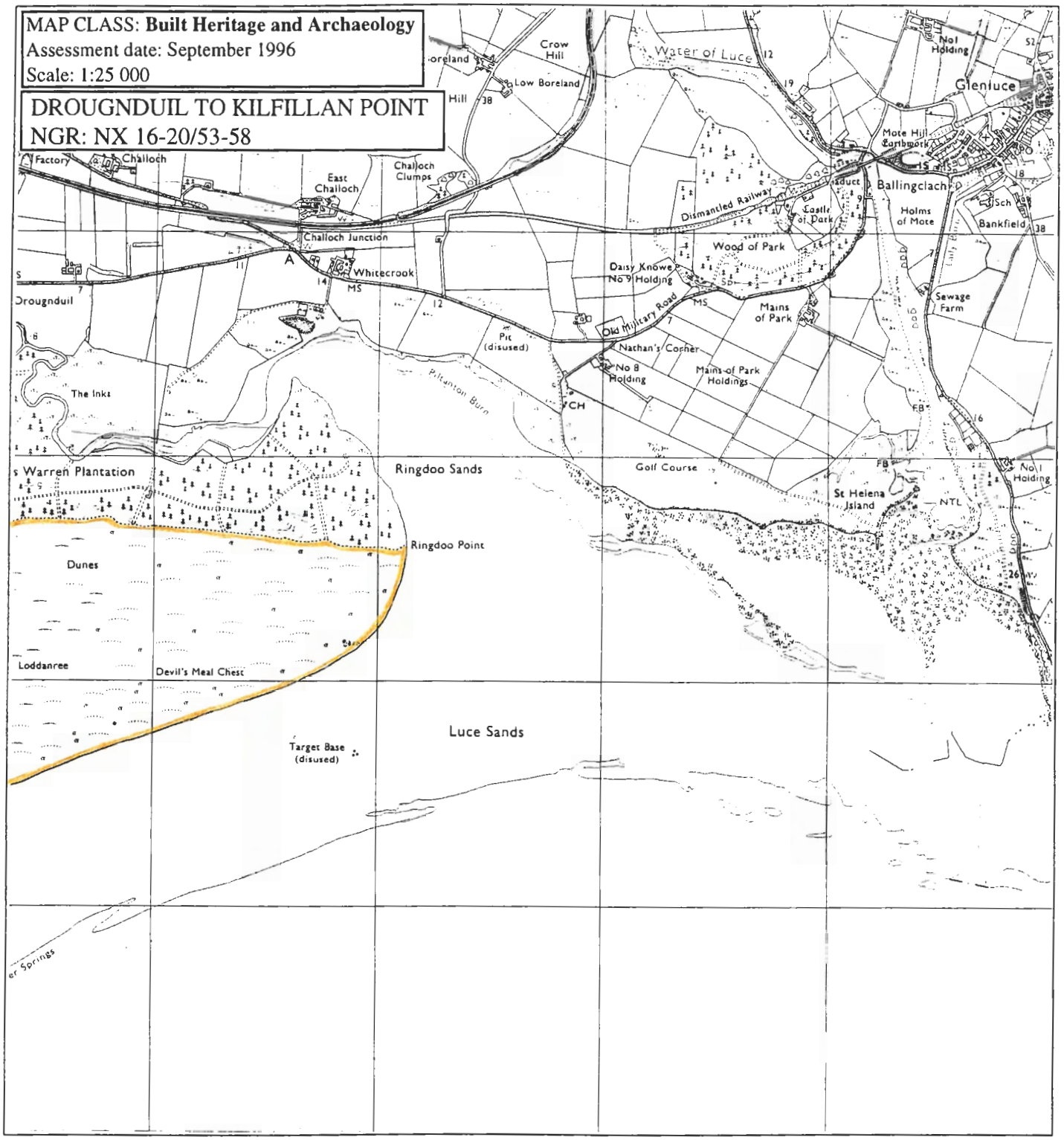
Erosion class	Derwent Code	Colour
Definitely accreting	Prussian Blue	
Accreting/stable	Light Blue	
Stable	Grass Green	
Stable/eroding	Deep Chrome	
Definitely eroding	Deep Vermilion	
Both accreting and eroding	Imperial Purple	
No access	Blank	
Land below 10m	Straw Yellow	

MAP CLASS: **EROSION**
Assessment date: 18.9.96
Scale 1:25 000



MAP CLASS: **Built Heritage and Archaeology**
Assessment date: September 1996
Scale: 1:25 000

DROUGNDUIL TO KILFILLAN POINT
NGR: NX 16-20/53-58



KEY

Site location	Symbol	Colour	Significance
NGR ref. - eg. NX 143 368	Roundel - Solid, (or area)	Red	Protected Ancient Monument
	Cross	Red	Listed Historic Building
	Roundel - Open, (or area)	Red	Monument formally proposed by Historic Scotland for designation
NMRS ref. - eg. NX13 SW17	Roundel - Solid, (or area)	Yellow	Other known Ancient Monument
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	Roundel - Solid, (or area)	Yellow	Undesignated wreck
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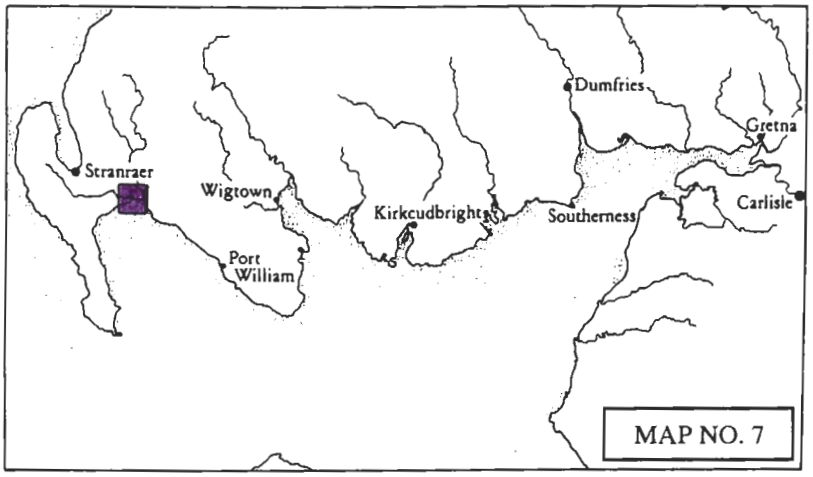


MAP 7: BUILT HERITAGE AND ARCHAEOLOGY

Sites on the Coast & Foreshore	Sites in the Hinterland
None	See Map 6

MAP 8: KILFILLAN POINT TO CRAIG LODGE

Hinterland Geology and Coastal Geomorphology: This region of the coastline is very exposed forming the eastern side of Luce Bay. The coast is composed of noticeably harder rocks with a steeply incised cliff-edge. From Killfillan Point to Slackmore point the hinterland is mostly till over visible rock. However, a small parcel of fluvioglacial sands and gravels outcrop at Stairhaven Bay. The shoreline is wide at Stair Haven and becoming irregular towards the east which is backed by precipitous cliffs and exposed rock platform. Deep gullies are common and sea caves also occur.

Erosion Class: From Kilfillan Point to Craig Lodge the coastline is considered to be eroding owing to the basal scouring along the softer siltstone folds within the cliff. Cliff-retreat is occurring at an unknown rate caused by weathering of the overlying till which is exposed to wind, rain and spray. The foreshore at Stairhaven Bay is eroding badly, especially alongside a concrete sea wall where boulders and gravel are falling out of the section. The low intertidal area is scoured in parts resulting in bare patches where smaller boulders have been removed.

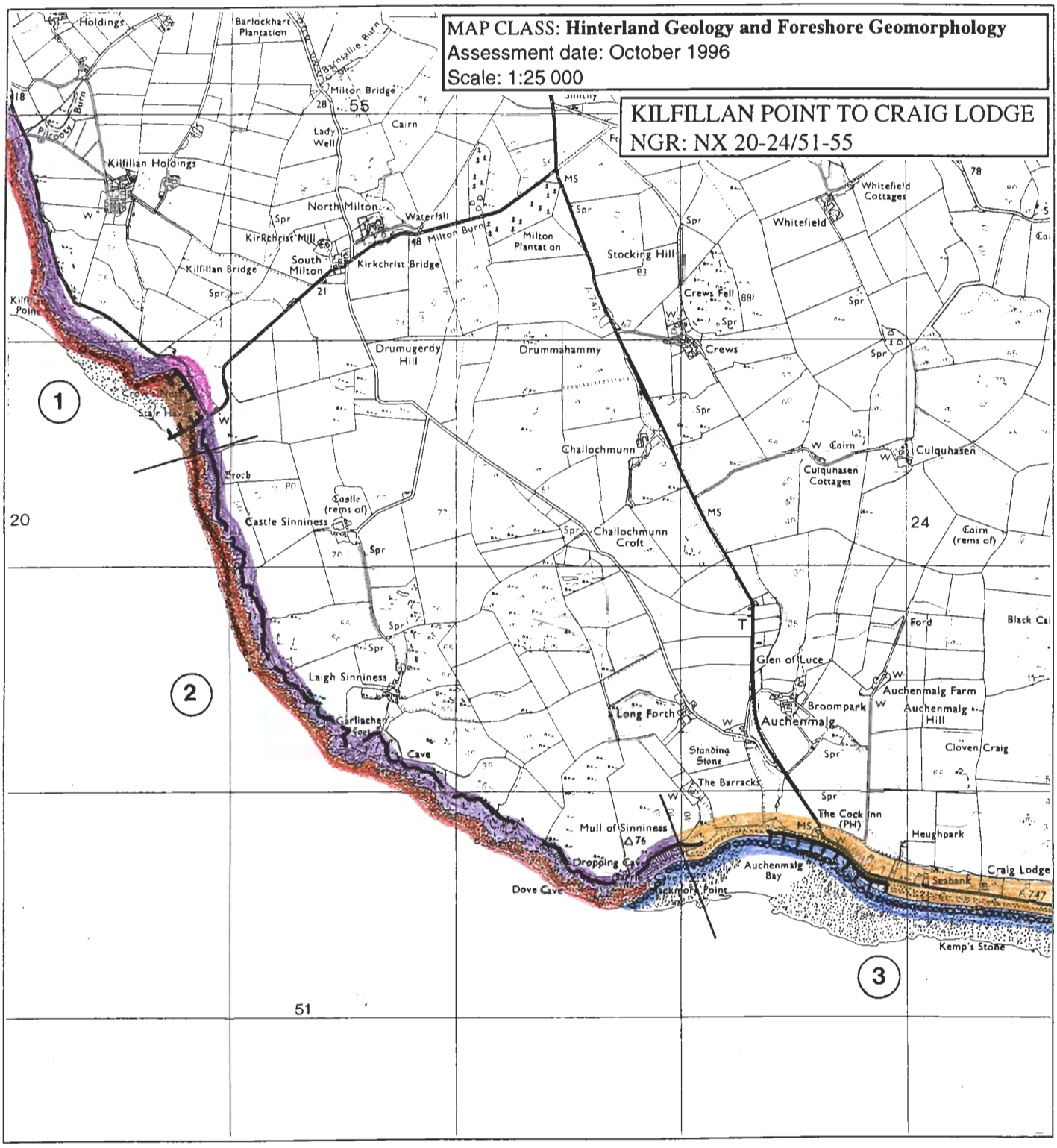
Built Heritage & Archaeology: This section has a high site density clustered around Stairhaven Bay. Most of the sites relate to the nineteenth century when the bay served as a small working port (Graham, 1979, 64-65). Two sites belong to the later prehistoric period however; Laigh Sinniness promontory fort and Stairhaven Broch. Stairhaven broch, one of only three recognised brochs in Galloway, was 'excavated' in the 1970's; an event which removed many of the tumbled stones protecting the surviving structure from erosion (Yates, 1983, 95). Consequently the structure of Stairhaven broch is more vulnerable now, particularly from storm damage. All the sites situated on the coastal edge are suffering from severe to fair coastal erosion and storm damage, particularly in Stairhaven Bay, and monitoring is recommended. In relation to the promontory fort of Laigh Sinniness, a more significant threat from animal and farming activity exists.

Map 8: Hinterland Geology and Coastal Geomorphology

1. South of No1 HOLDING to STAIR HAVEN BAY
NX 205 544
2km
Cliff (> 10m) and low edge (< 5m) at Stairhaven Bay
Mainly shallow till and drift overlying rock
Broken rocky coastal edge overlain by *till* and drift deposits. Glacial sands and gravels outcrop at Stairhaven Bay. The intertidal area is wide (c.80m) and consists on boulder and shingle beds intermixed with sand bars.

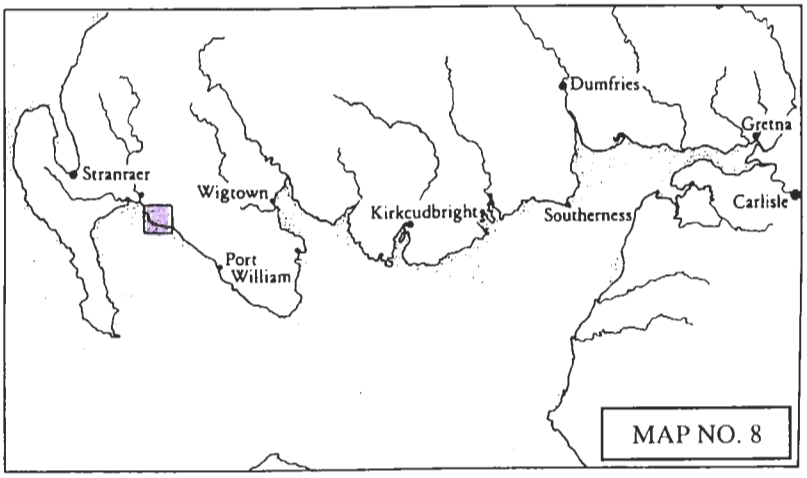
2. STAIRHAVEN to SLACKMORE POINT
NX 213 525
3km
Cliff (> 10m)
Mainly shallow till and drift overlying rock
The hinterland consists of precipitous greywackee cliffs with a shallow *till* cover. The foreshore is outcropping rock platform.

3. STACKMORE POINT to east of CRAIGNARGET
NX 245 515
3km
Low edge (< 10m)
Marine sands and gravels with till east of Craignarget
The exposed hinterland consists of marine sands and gravels. The foreshore is wide with an admixture of poorly sorted boulders and sandy spits.



KEY

Hinterland Geology	Derwent Code	Colour
Drift, boulder clay	French Grey	
Drift, boulder clay over visible rock	Dark Violet	
Raised beach and marine deposits	Golden Brown	
Blown sand	Pink Madder Lake	
Glacial sand and gravel	Magenta	
Alluvium	Emerald Green	
Coastal Geomorphology		
Mainly rock platform	Deep vermilion	
Mainly sand	Ultramarine	
Mainly alluvial/marine mud	Venetian Red	
Marsh	May Green	
Coast Edge		
Low edge (<5m)	Thin black line	
Cliff (>5m)	Solid black line	
Man made barrier	Black line with spines	
Shingle beach	Small circles	
Human disturbance	Black carats	



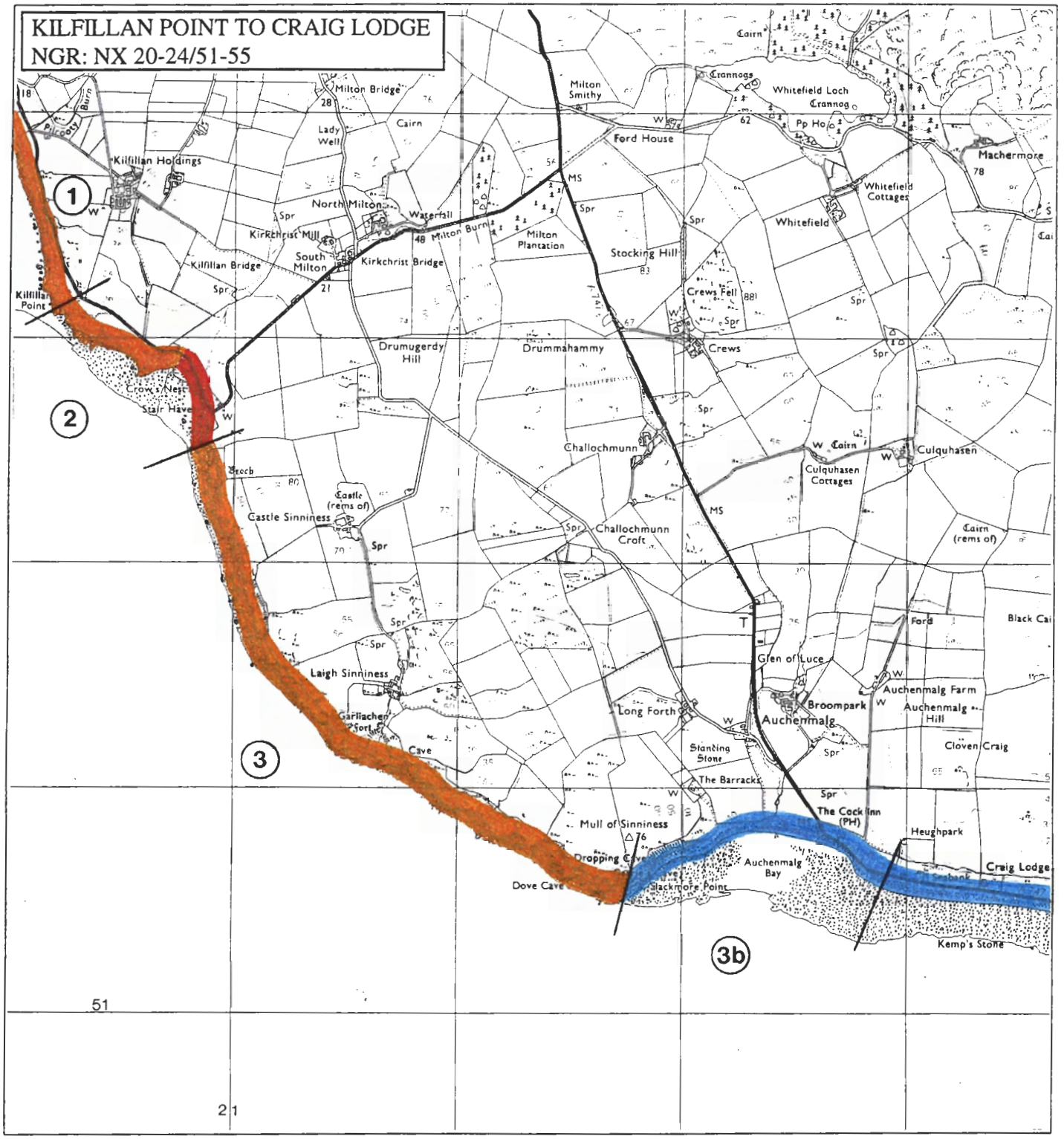
MAP 8: EROSION

1. ST HELENA ISLAND to KILFILLAN POINT
NX 201 547
1.7km
Eroding or stable
This unit has an exposed south westerly aspect and contains an indented rocky shoreline with shingle at the HWM. This region appears to be eroding only slowly.

2. KILFILLAN POINT to east of STAIRHAVEN BAY
NX 205 540
2.8km
Definitely eroding
This unit has an irregular cliff edge and an intertidal zone that is extremely wide (current SLWM is c.0.2km) consisting of boulders and sandy bars. Some sand accretion is occurring at the mouth of a small burn that enters the bay. Armour stone and Rip-Rap wall has been used with limited success as erosion is occurring either side of these works. More serious erosion is occurring to the east of a ruined pier. The 1946 vertical aerial photograph shows that the pier was extant. It has since collapsed and wave attack is accelerating erosion immediately east of the pier. Cliff edge retreat now stands in excess of 3m.

3. STAIRHAVEN BAY east to SLACKMORE POINT
NX 219 520
2.8km
Eroding or stable
This region of coastline consist of irregular indented greywackee cliffs. Erosion is occurring along the deep gullies and especially along faults and fractures. It is difficult to estimate cliff-edge retreat but it is estimated to be slow.

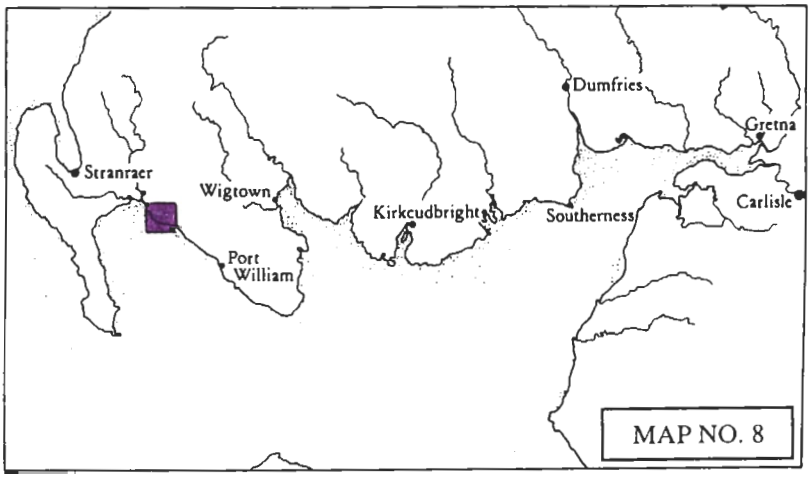
3b. AUCHENMAIG BAY
NX 235 518
1.2km
Accreting or stable
This bay has a wide intertidal zone consisting of outcropping cleaved greywackee and wide areas of sand and shingle. The exposed promontory headland at Stackmore Point is precipitous and wave abraded rock fall is evident at its base. Poorly sorted shingle is banking up at the current HWM in the centre of the bay which is defended by a concrete sea wall. The shingle is being deposited by longshore drift on a predominately easterly fetch.



KEY

Erosion class	Derwent Code	Colour
Definitely accreting	Prussian Blue	
Accreting/stable	Light Blue	
Stable	Grass Green	
Stable/eroding	Deep Chrome	
Definitely eroding	Deep Vermilion	
Both accreting and eroding	Imperial Purple	
No access	Blank	
Land below 10m	Straw Yellow	

MAP CLASS: **EROSION**
Assessment date: 24.9.96
Scale 1:25 000



MAP 8: BUILT HERITAGE AND ARCHAEOLOGY

Sites on the Coast Edge & Foreshore

NX 2084 5358
STAIR HAVEN BAY
Possible Wooden Pier/Fish Rack
Uncertain
Poor
Survey & Monitor

NX25SW 53
NX 2083 5365
STAIR HAVEN BAY
Stone & Rubble Pier
19th century
Poor
Survey & Monitor

NX 2087 5361
STAIR HAVEN BAY
Ruined Harbour House
19th century
Fair
Survey & Monitor

NX25SW 9
NX 2091 5335
STAIR HAVEN
Broch
Scheduled Ancient Monument
2nd century BC - 2nd century AD
Fair
Survey & Monitor

NX25SW 10
NX 2157 5219
LAIGH SINNINESS
Promontory Fort
Scheduled Ancient Monument
1st Mill. BC/AD
Fair
Monitor

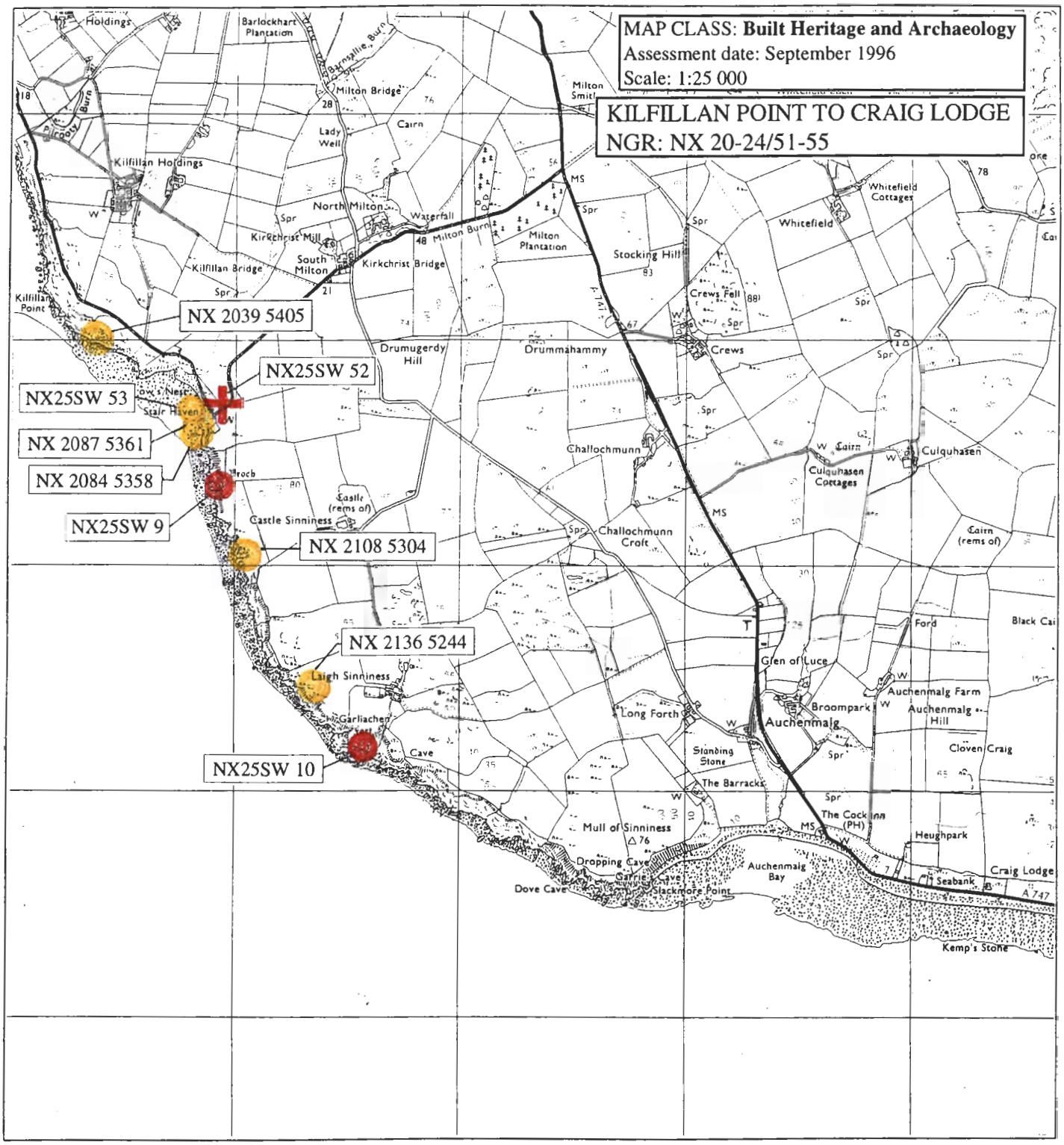
Sites in the Hinterland

NX 2039 5405
KILFILLAN POINT
Quarry
Uncertain
Good
Nil

NX25SW 52
NX 2094 5370
STAIR HAVEN
Ruined Warehouse
Statutory Listed Building
Mid 19th century
Good
Nil

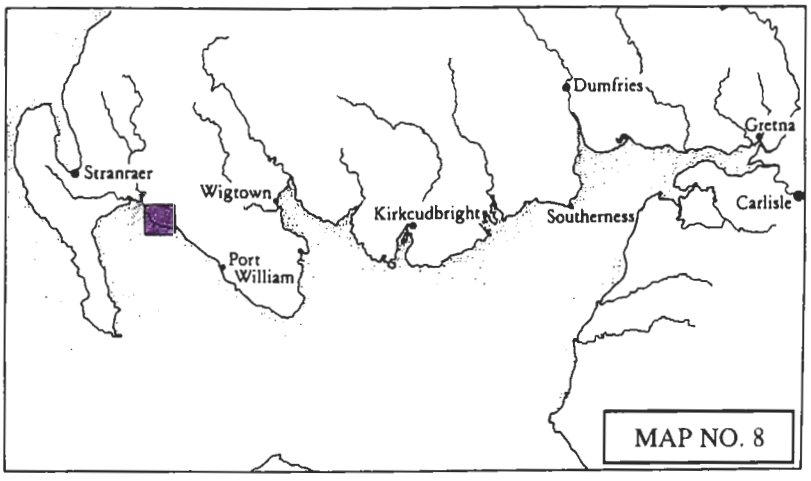
NX 2108 5304
SINNINESS
Wooden Post
19/20th century
Good
Nil

NX 2136 5244
LAIGH SINNINESS
FIELD CAIRN
Uncertain
Good
Nil



KEY

Site location	Symbol	Colour	Significance
NGR ref. - eg. NX 143 368	Roundel - Solid, (or area)	Red	Protected Ancient Monument
	Cross	Red	Listed Historic Building
	Roundel - Open, (or area)	Red	Monument formally proposed by Historic Scotland for designation
	Roundel - Solid, (or area)	Yellow	Other known Ancient Monument
NMRS ref. - eg. NX13 SW17	Dashed outline	Yellow	Gardens/Designed landscape
	Roundel - Solid, (or area)	Yellow	Undesignated wreck
	Area	Green	Insufficient information; more work needed
	Area	Blue	Probably archaeologically sterile



MAP 9: DOVE CAVE TO GARHEUGH

Hinterland Geology and Coastal Geomorphology: This stretch of coastline is exposed to south westerly winds and changes dramatically from a high cliffs to a hinterland dominated by raised beach deposits. The break in the geology occurs at Auchenmaig Bay. From this area east to Garheugh the hinterland becomes dominated by raised beaches. These run sub-parallel to the foreshore. Where the deposits are exposed they are seen to consist of stratified sands and reasonably well sorted gravels. Till deposits occur east of Craigarnet. The foreshore in front of the Cock Inn public house is protected by a sea-wall. The intertidal zone is fairly wide with sand and shingle banking up at the SHWM. Towards Garheugh, low rock platform outcrops on the foreshore.

Erosion Class: The occurrence of a fairly wide berm of shingle and sand at the HWM shows that this section of the coast is accreting and stable at the present.

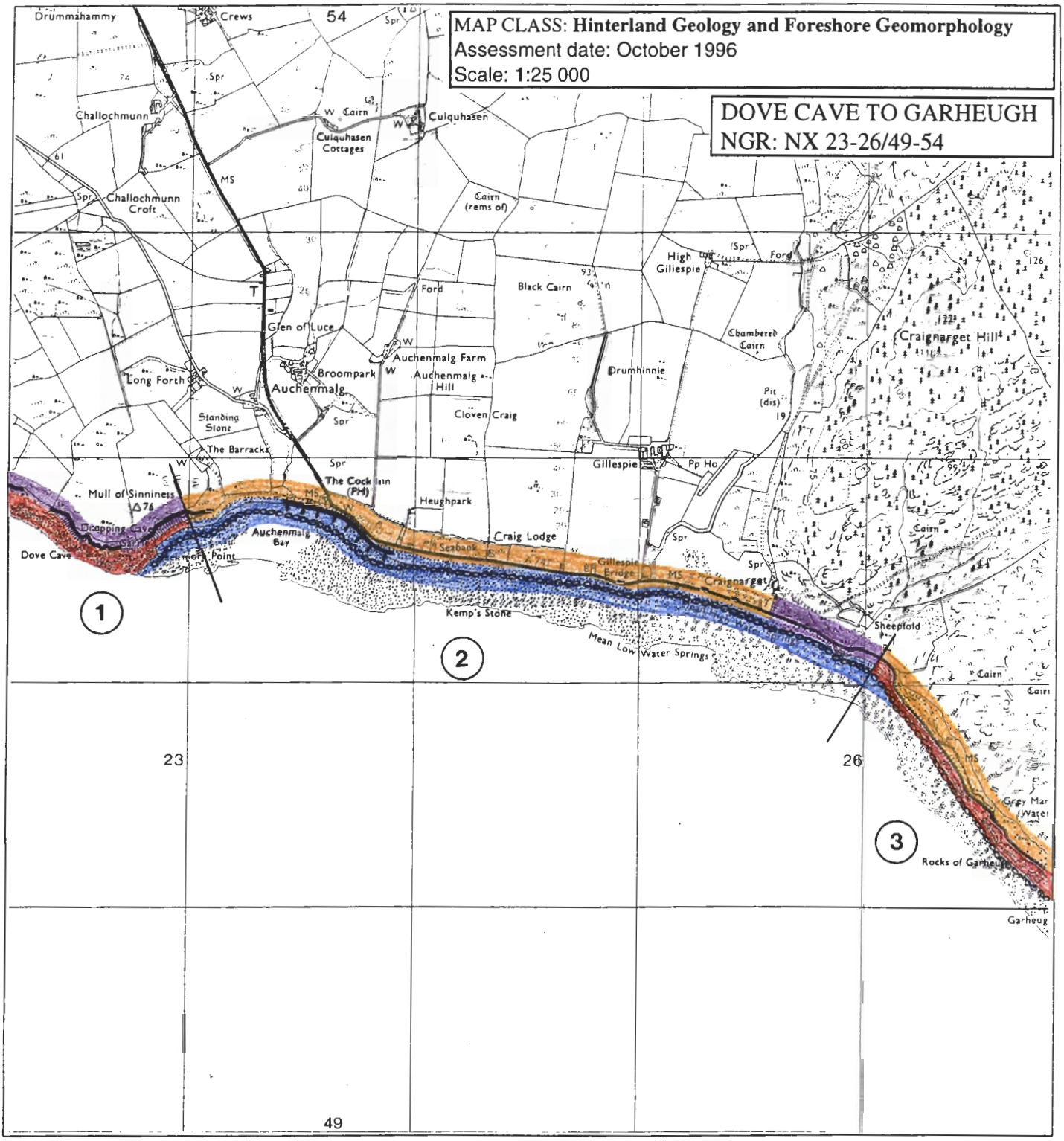
Built Heritage & Archaeology: (NONE)

Map 9: Hinterland Geology and Coastal Geomorphology

1. STAIRHAVEN to SLACKMORE POINT
NX 213 525
3km
Cliff (> 10m)
Mainly shallow till and drift overlying rock
The hinterland consists of precipitous greywackee cliffs with a shallow till cover. The foreshore is outcropping rock platform.

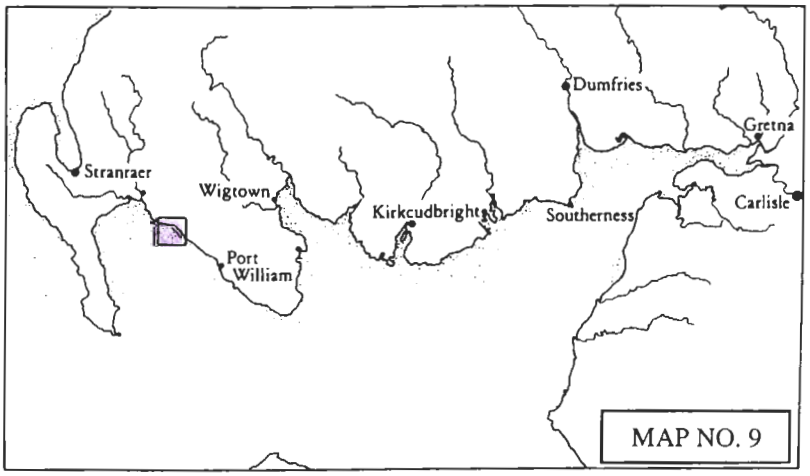
2. SLACKMORE POINT to east of CRAIGNARGET
NX 245 515
3km
Cliff (< 10m)
Marine sands and gravels with till east of Craignarget
The exposed hinterland consists of marine sands and gravels. The foreshore is wide with an admixture of poorly sorted boulders and sandy spits.

3. East of CRAIGNARGET to GARHEUGH PORT
NX 265 500
1.5km
Cliff (>10m)
Raised beach
Raised beach deposits run sub-parallel to the foreshore. The shoreline is wide with sand and poorly sorted boulders.



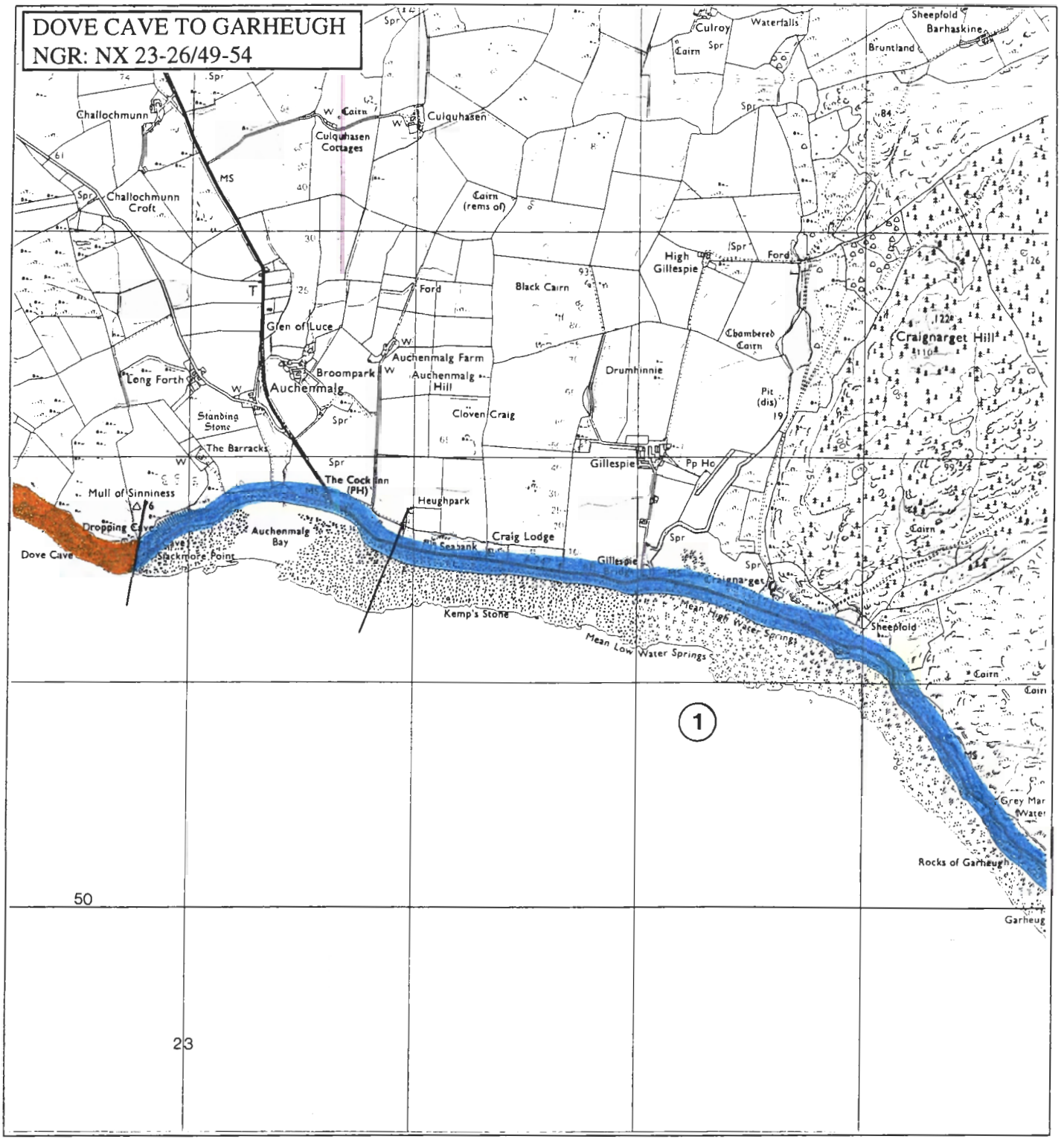
KEY

Hinterland Geology	Derwent Code	Colour
Drift, boulder clay	French Grey	
Drift, boulder clay over visible rock	Dark Violet	
Raised beach and marine deposits	Golden Brown	
Blown sand	Pink Madder Lake	
Glacial sand and gravel	Magenta	
Alluvium	Emerald Green	
Coastal Geomorphology		
Mainly rock platform	Deep vermilion	
Mainly sand	Ultramarine	
Mainly alluvial/marine mud	Venetian Red	
Marsh	May Green	
Coast Edge		
Low edge (<5m)	Thin black line	
Cliff (>5m)	Solid black line	
Man made barrier	Black line with spines	
Shingle beach	Small circles	
Human disturbance	Black carats	



MAP 9: EROSION

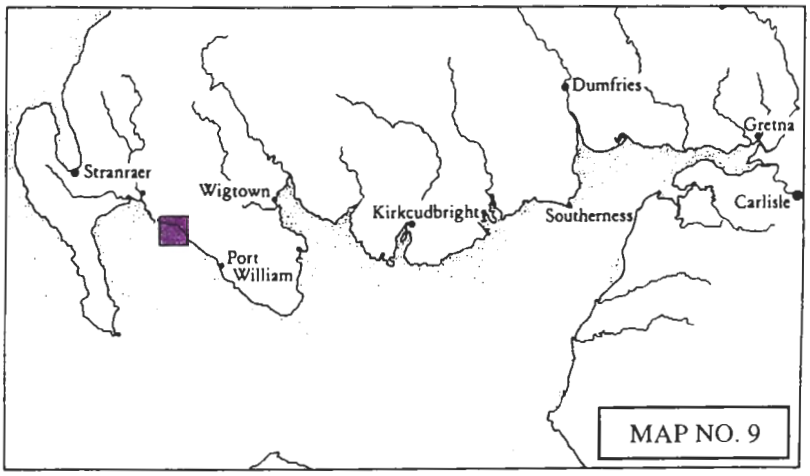
1. HEUGHPARK to ALTICRY BRIDGE
NX 245 515
3.9km
Stable or accreting
This unit has a very wide exposed foreshore consisting of outcropping rocks, boulders, sandy spits and shingle banks. The backshore is well vegetated and appears to be stable.



KEY

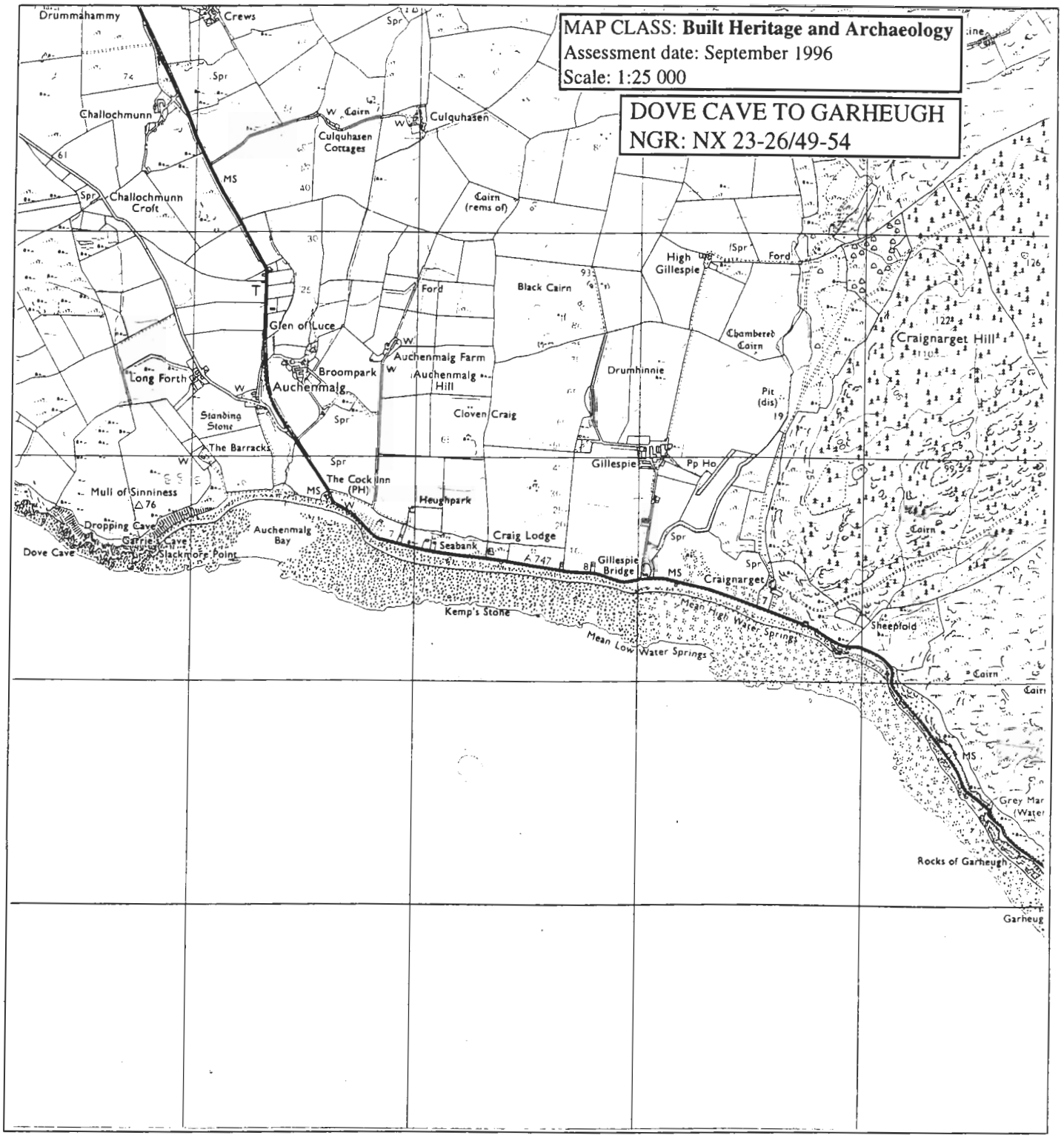
Erosion class	Derwent Code	Colour
Definitely accreting	Prussian Blue	
Accreting/stable	Light Blue	
Stable	Grass Green	
Stable/eroding	Deep Chrome	
Definitely eroding	Deep Vermilion	
Both accreting and eroding	Imperial Purple	
No access	Blank	
Land below 10m	Straw Yellow	

MAP CLASS: **EROSION**
Assessment date: 24.9.96
Scale 1:25 000



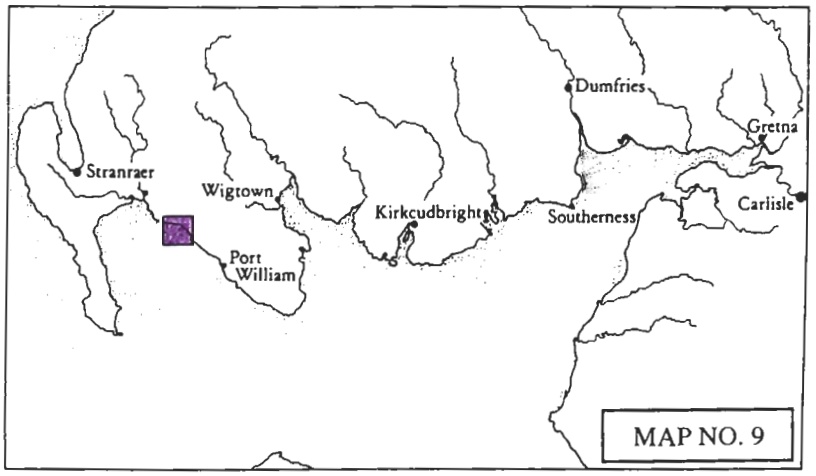
MAP 9: BUILT HERITAGE AND ARCHAEOLOGY

Sites on the Coast Edge & Foreshore	Sites in the Hinterland
None	None



KEY

Site location	Symbol	Colour	Significance
NGR ref. - eg. NX 143 368	Roundel - Solid, (or area)	Red	Protected Ancient Monument
	Cross	Red	Listed Historic Building
	Roundel - Open, (or area)	Red	Monument formally proposed by Historic Scotland for designation
	Roundel - Solid, (or area)	Yellow	Other known Ancient Monument
NMRS ref. - eg. NX13 SW17	Dashed outline	Yellow	Gardens/Designed landscape
	Roundel - Solid, (or area)	Yellow	Undesignated wreck
	Area	Green	Insufficient information; more work needed
	Area	Blue	Probably archaeologically sterile



MAP 10: CRAIGNARGET TO CHANGUE BRIDGE

Hinterland Geology and Coastal Geomorphology: The hinterland along this region of coastline contains impressive raised beaches, particularly between Cornwall Heugh and Changhe Heugh. The raised beach deposits rise above 10m and are indented in parts. The foreshore is rocky to the west of Garheugh Port (NX 499500). South-east of this location the foreshore becomes much narrower and is dominated by poorly sorted boulders and sand. Shingle is banking up at the SHWM.

Erosion Class: This region of the coast is accreting and considered to be stable based on the occurrence of shingle at the SHWM. At Alticry Bridge a concrete sea wall has been placed to protect a private parking area. Shingle is piling up against the wall and therefore this unit (Unit 1) is considered to be stable.

Built Heritage & Archaeology: This section has a wide distribution of sites ranging in date from early prehistory through early medieval to the post-medieval period. Three landing places and Chapel Finian can be found on the coastal edge. Inland a newly identified possible prehistoric kerbed cairn and axe hammer findspot, a medieval building, and post-medieval structures and field walls are located. The majority of the inland sites were not located in the field survey due to the thick vegetation cover of the area and therefore the state of preservation could not be ascertained. None of the coastal sites are threatened by coastal erosion.

Map 10: Hinterland Geology and Coastal Geomorphology

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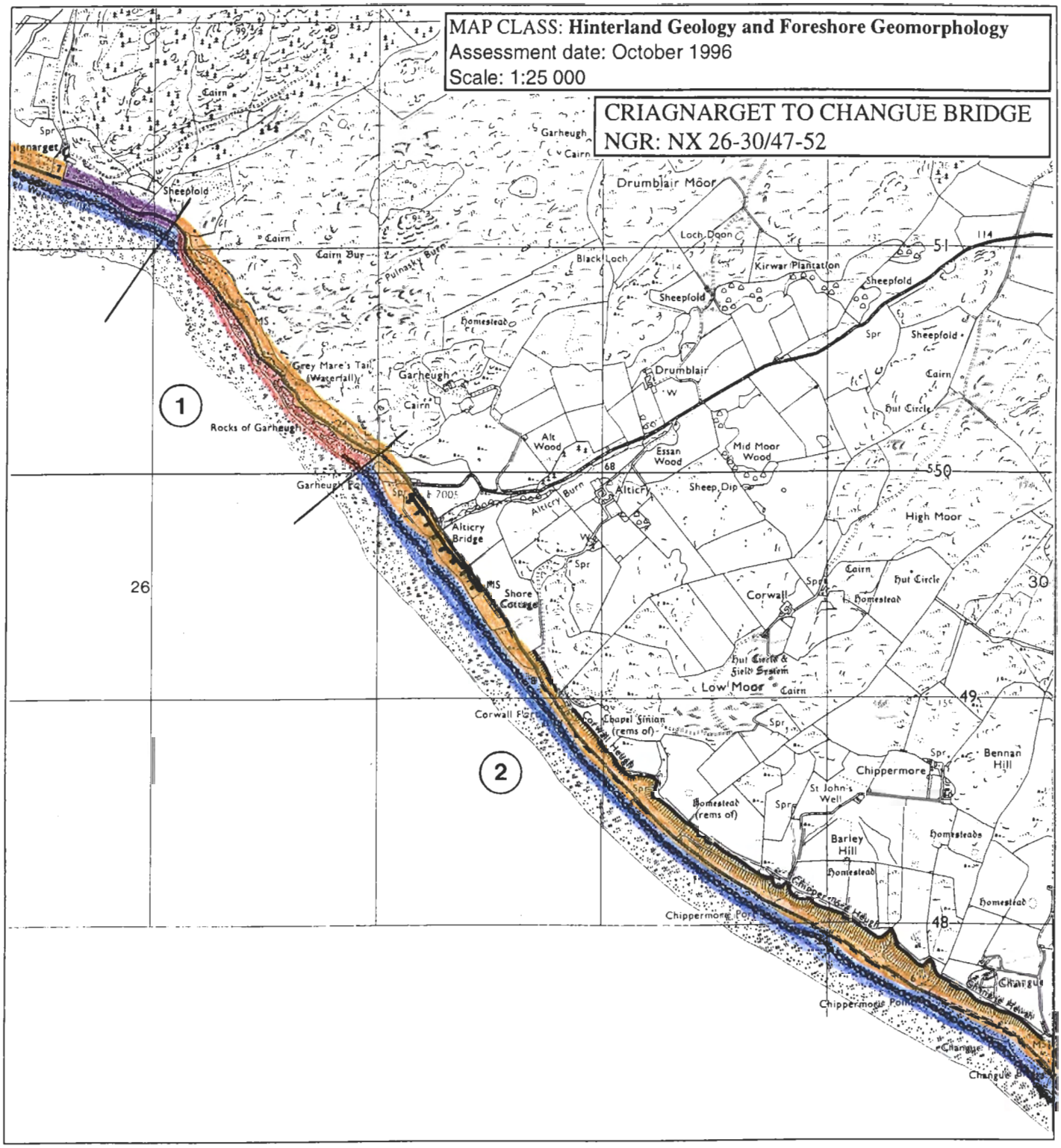
1. East of CRAIGNARGET to GARHEUGH PORT
NX 265 500
1.5km
Cliff (>10m)
Raised beach
Raised beach deposits run sub-parallel to the foreshore. The shoreline is wide with sand and poorly sorted boulders.

2. GARHEUGH PORT to MILTON POINT
NX 305 470
3.5km
Cliff (> 10m)
Raised beach/marine sands and gravels
Spectacular indented raised beaches run the length of this unit. The foreshore is consists of poorly sorted boulders intermixed with sand bars.

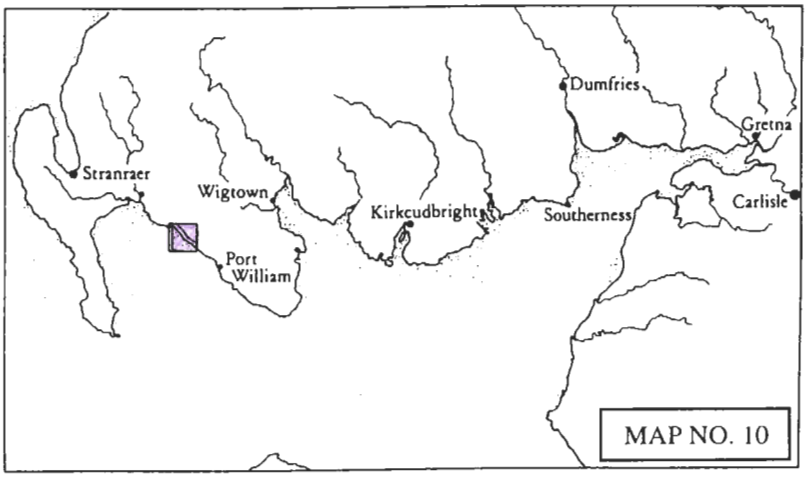
MAP CLASS: **Hinterland Geology and Foreshore Geomorphology**
Assessment date: October 1996
Scale: 1:25 000

CRIAGNARGET TO CHANGUE BRIDGE
NGR: NX 26-30/47-52



KEY

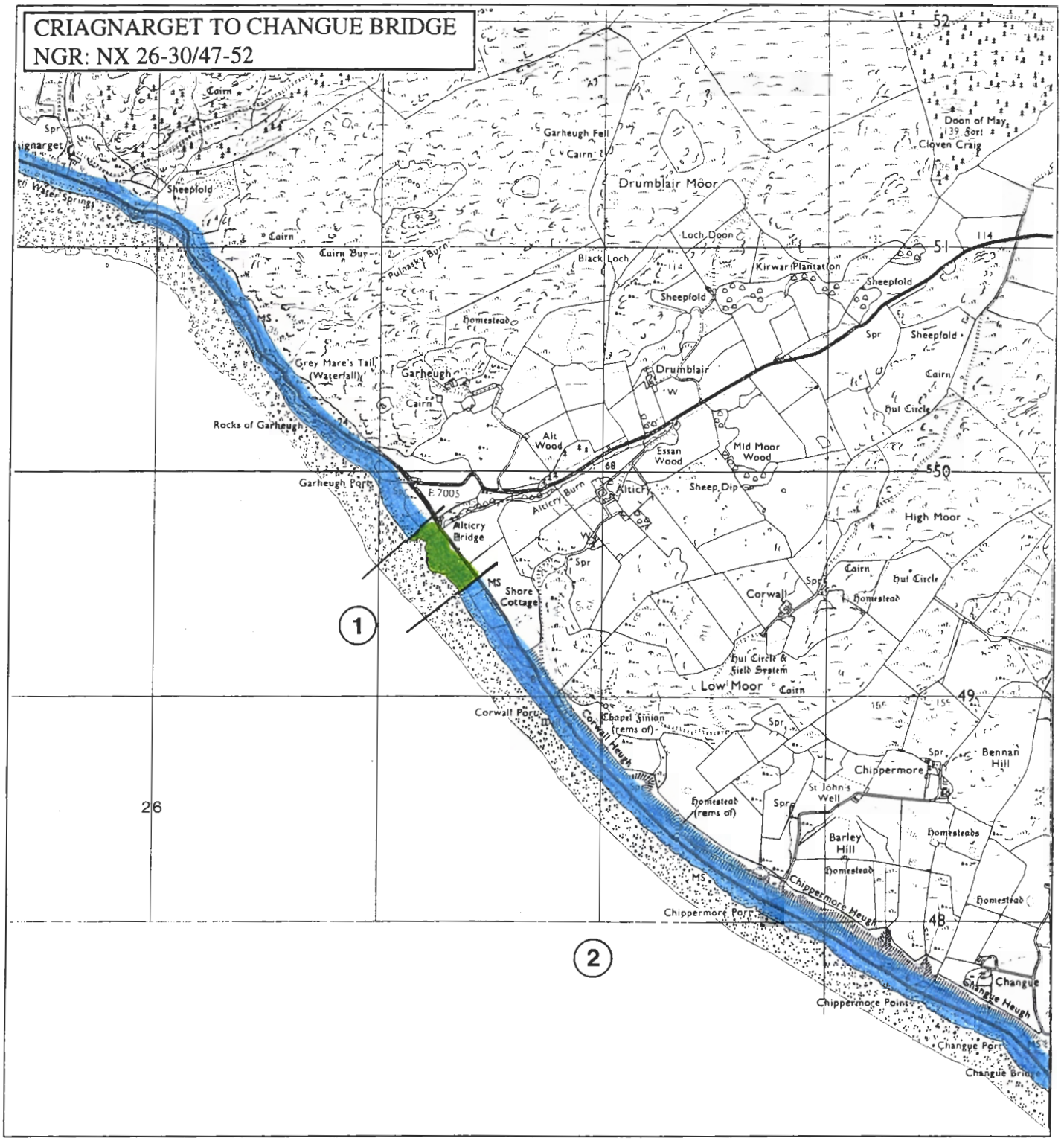
Hinterland Geology	Derwent Code	Colour
Drift, boulder clay	French Grey	
Drift, boulder clay over visible rock	Dark Violet	
Raised beach and marine deposits	Golden Brown	
Blown sand	Pink Madder Lake	
Glacial sand and gravel	Magenta	
Alluvium	Emerald Green	
Coastal Geomorphology		
Mainly rock platform	Deep vermilion	
Mainly sand	Ultramarine	
Mainly alluvial/marine mud	Venetian Red	
Marsh	May Green	
Coast Edge		
Low edge (<5m)	Thin black line	
Cliff (>5m)	Solid black line	
Man made barrier	Black line with spines	
Shingle beach	Small circles	oooooo
Human disturbance	Black carats	^^^^^^



MAP 10: EROSION

1. ALTICRY BRIDGE
NX 273 496
0.3km
Stable
Stone walls are employed to protect a private parking area. This has led to shingle accretion against the base of the wall. The foreshore appears to be afforded further stability by vegetation cover.

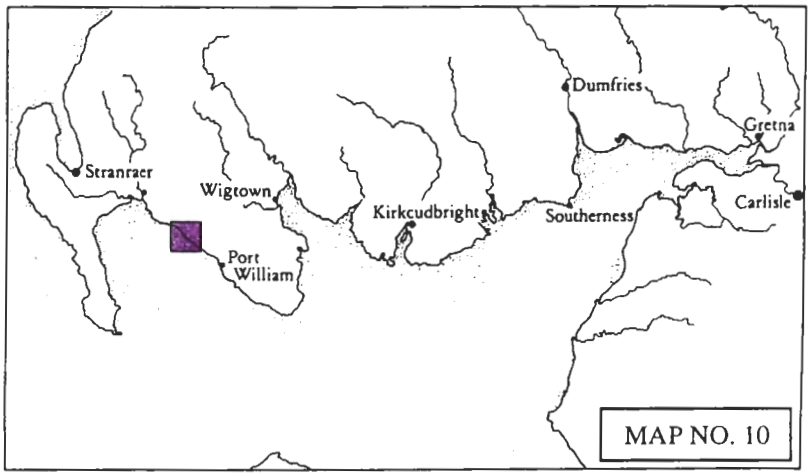
2. AITICRY BRIDGE to MILTON POINT
NX 284 482
5km
Accreting or stable
This unit has a uniform and unchanging coastline for most of its length and has a wide intertidal zone that contains large areas of poorly sorted boulders, outcropping rock, sandy spits and shingle bars. The foreshore is banked with shingle at the current HWM which suggests that this section is stable at the present.

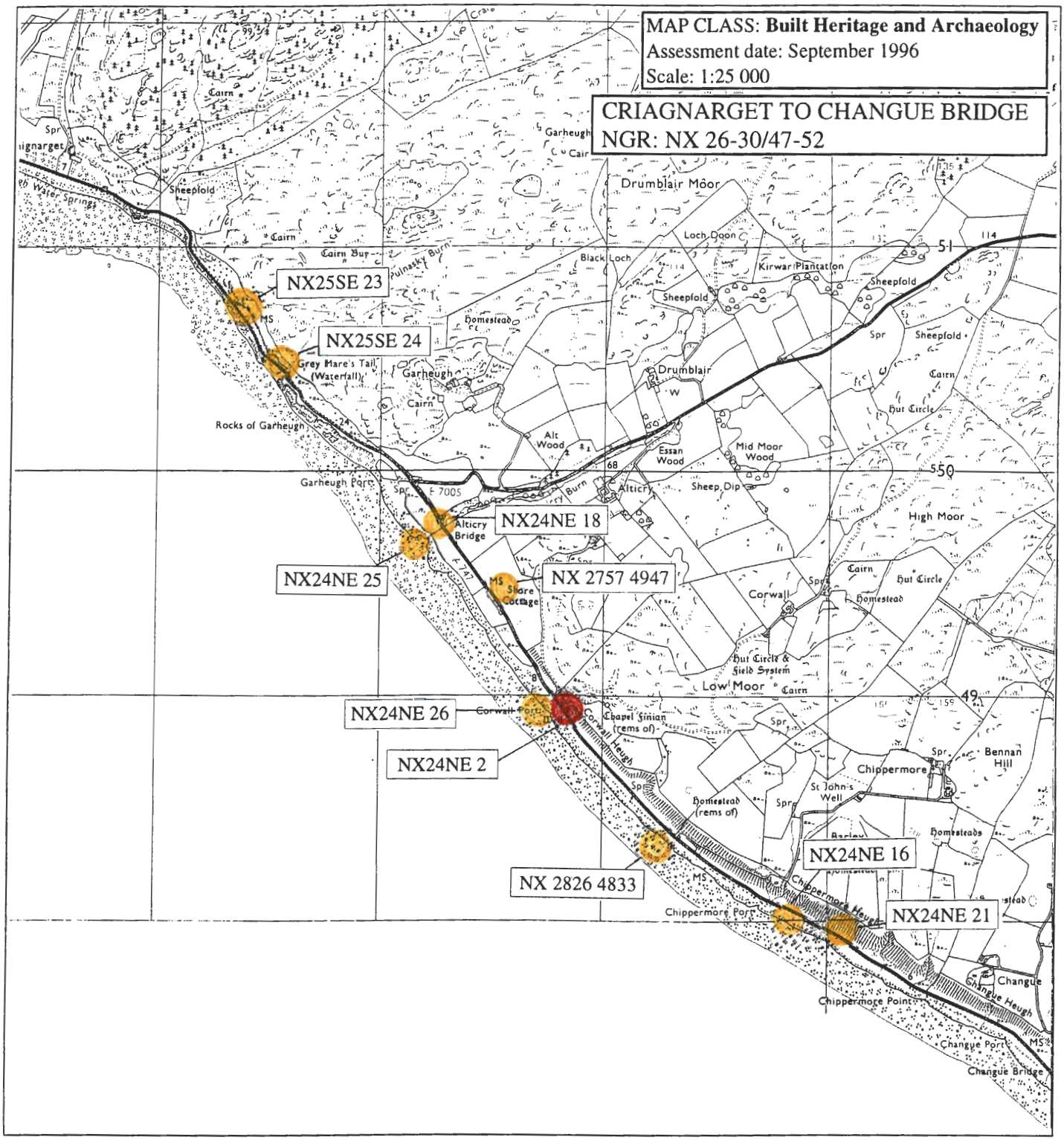


KEY

Erosion class	Derwent Code	Colour
Definitely accreting	Prussian Blue	
Accreting/stable	Light Blue	
Stable	Grass Green	
Stable/eroding	Deep Chrome	
Definitely eroding	Deep Vermilion	
Both accreting and eroding	Imperial Purple	
No access	Blank	
Land below 10m	Straw Yellow	

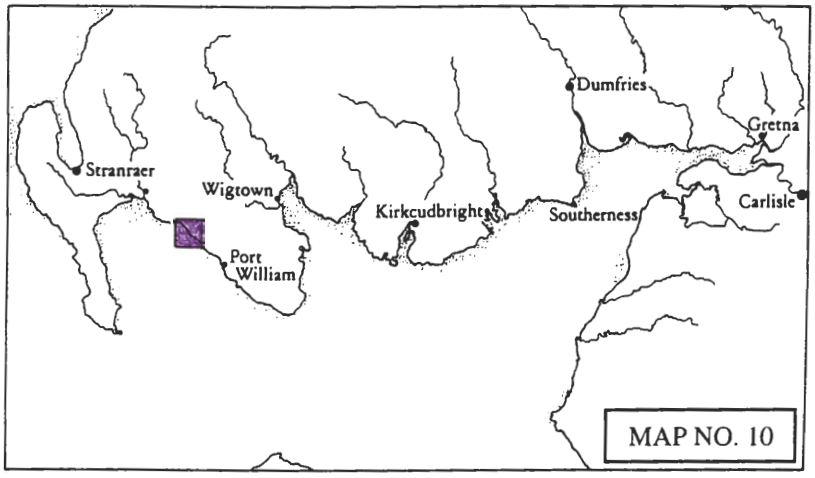
MAP CLASS: **EROSION**
Assessment date: 24.9.96
Scale 1:25 000





KEY

Site location	Symbol	Colour	Significance
NGR ref. - eg. NX 143 368	Roundel - Solid, (or area)	Red	Protected Ancient Monument
	Cross	Red	Listed Historic Building
	Roundel - Open, (or area)	Red	Monument formally proposed by Historic Scotland for designation
	Roundel - Solid, (or area)	Yellow	Other known Ancient Monument
NMRS ref. - eg. NX13 SW17	Dashed outline	Yellow	Gardens/Designed landscape
	Roundel - Solid, (or area)	Yellow	Undesignated wreck
	Area	Green	Insufficient information; more work needed
	Area	Blue	Probably archaeologically sterile



MAP 11: CHANGUE BRIDGE TO BOTTLE HOLE BRIDGE

Hinterland Geology and Coastal Geomorphology: This region of the coast is exposed and contains spectacular raised beaches that rise to over c.20 metres near West Bar (NX 320 462). From this location the crest of the raised beaches become more irregular in outline. The foreshore is wide consisting of shingle at the HWMS with poorly sorted boulders, cobbles and sands, with occasional sand bars down to the MLWS.

Erosion Class: The wide intertidal zone has a south-westerly aspect and a wide foreshore. Shingle is banked up at the current HWMS along most of this region of the coast which is considered to be accreting and stable. A small headland called Philip and Mary (NX 324 457) is wider on its eastern side, probably due to the damping effect of wave energy. This is causing sand and shingle to accrete to the east of the headland.

Built Heritage & Archaeology: This section includes only three sites, all located in the hinterland. They comprise a possible rectilinear enclosure identified from aerial photographs, a nineteenth century watermill and a track of uncertain date. All three sites survive in a fair condition and do not require monitoring.

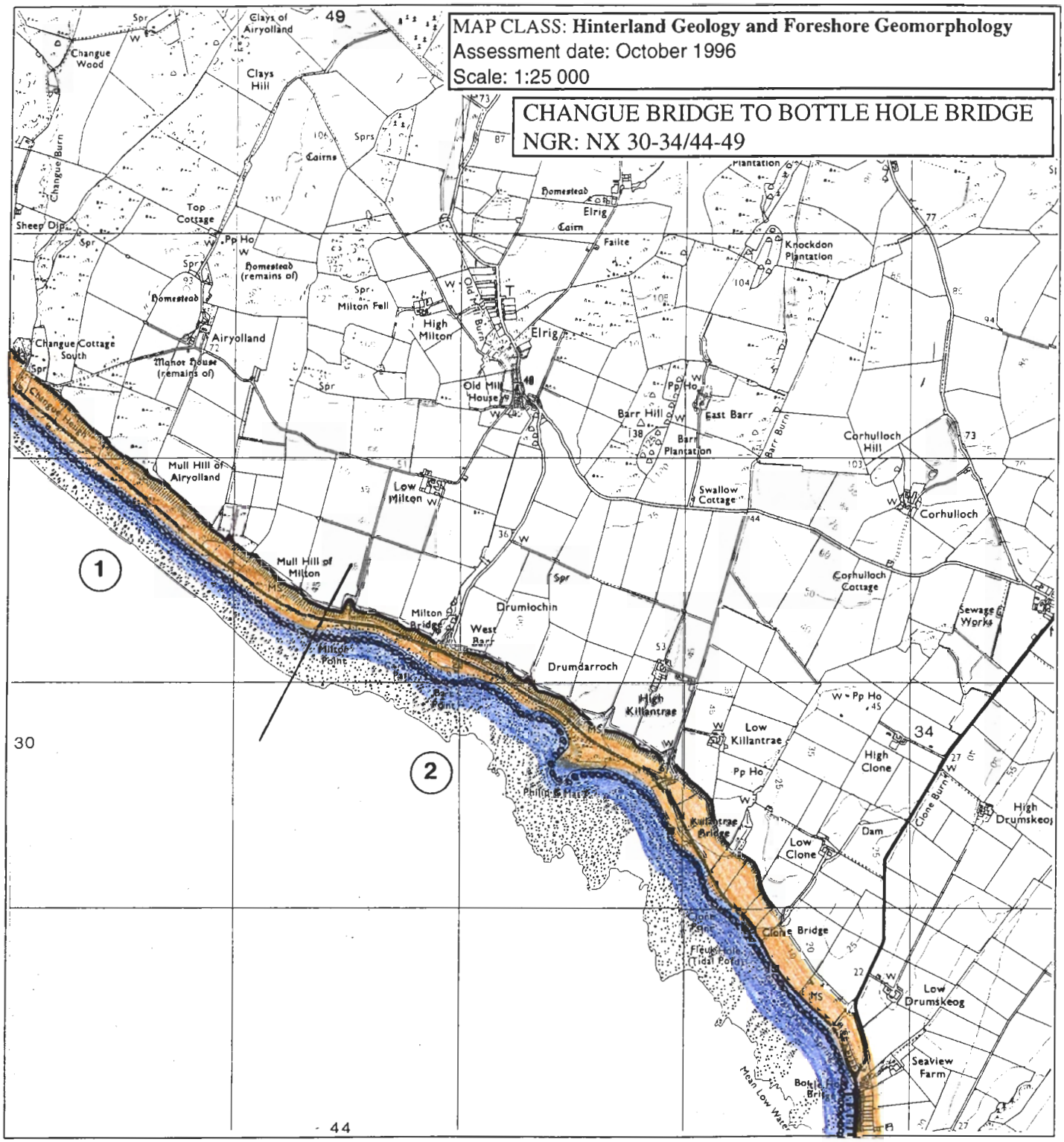
Map 11: Hinterland Geology and Coastal Geomorphology

1. GARHEUGH PORT to MILTON POINT
NX 305 470
3.5km
Cliff (> 10m)
Raised beach/marine sands and gravels
Spectacular indented raised beaches run the length of this unit. The foreshore is consists of poorly sorted boulders intermixed with sand bars.

2. MILTON POINT to PORT WILLIAM
NX 333 450
3.2km
Cliff (> 10m)
Mainly raised beach and relict shoreline
Raised beaches run the length of this unit. These tend to be steeper towards West Bar (NX320462) than at Kilantrae Bridge (NX332454) where a wave cut platform occurs on the 10m contour. The foreshore is very wide containing sand bars, shingle beds and large poorly sorted boulders.

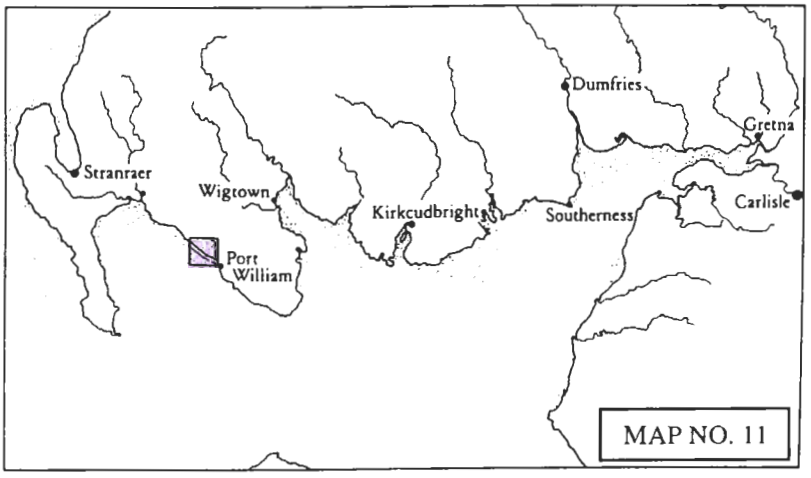
MAP CLASS: **Hinterland Geology and Foreshore Geomorphology**
Assessment date: October 1996
Scale: 1:25 000

CHANGUE BRIDGE TO BOTTLE HOLE BRIDGE
NGR: NX 30-34/44-49



KEY

Hinterland Geology	Derwent Code	Colour
Drift, boulder clay	French Grey	
Drift, boulder clay over visible rock	Dark Violet	
Raised beach and marine deposits	Golden Brown	
Blown sand	Pink Madder Lake	
Glacial sand and gravel	Magenta	
Alluvium	Emerald Green	
Coastal Geomorphology		
Mainly rock platform	Deep vermilion	
Mainly sand	Ultramarine	
Mainly alluvial/marine mud	Venetian Red	
Marsh	May Green	
Coast Edge		
Low edge (<5m)	Thin black line	
Cliff (>5m)	Solid black line	
Man made barrier	Black line with spines	
Shingle beach	Small circles	oooooo
Human disturbance	Black carats	^^^^^^

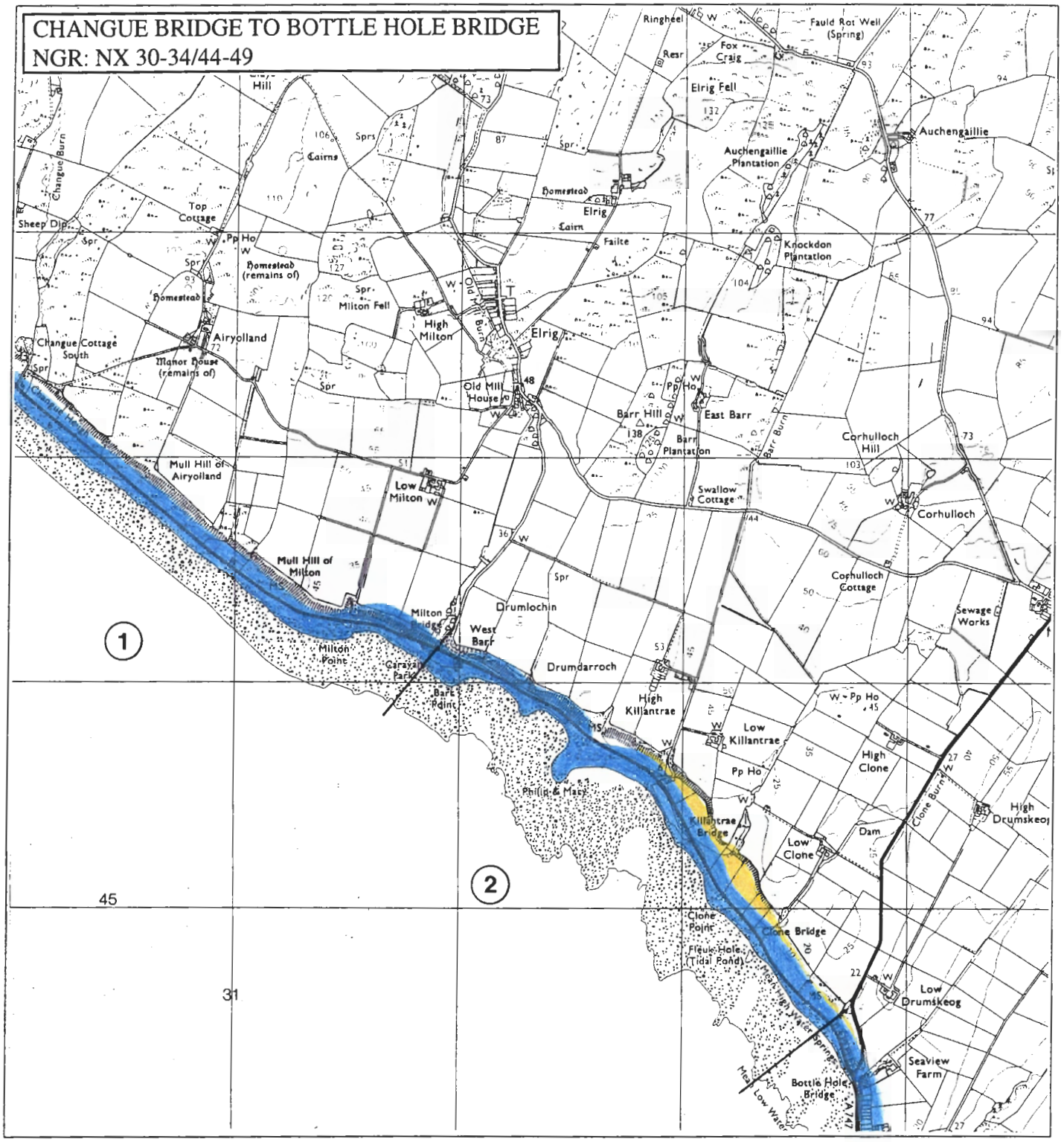


MAP 11: EROSION

1. AITICRY BRIDGE to MILTON POINT
NX 284 482
5km
Accreting or stable
This unit has a uniform and unchanging coastline for most of its length and has a wide intertidal zone that contains large areas of poorly sorted boulders, outcropping rock, sandy spits and shingle bars. The foreshore is banked with shingle at the current HWM which suggests that this section is stable at the present.

2. MILTON BRIDGE to north of BOTTLE HOLE BRIDGE
NX 330 453
2.5km
Accreting or stable
A wide intertidal zone contains boulders, sand and shingle. Shingle is banked up at the current HWM for most of length of this unit. A small headland called Philip and Mary (NX 324 is wider on the eastern side probably due to the damping effect of wave energy that has caused deposition of marine deposits directly behind the

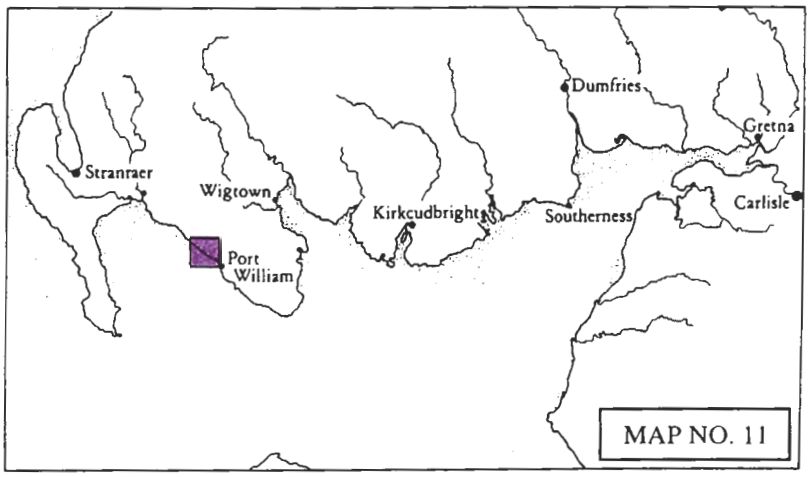
CHANGUE BRIDGE TO BOTTLE HOLE BRIDGE
NGR: NX 30-34/44-49



KEY

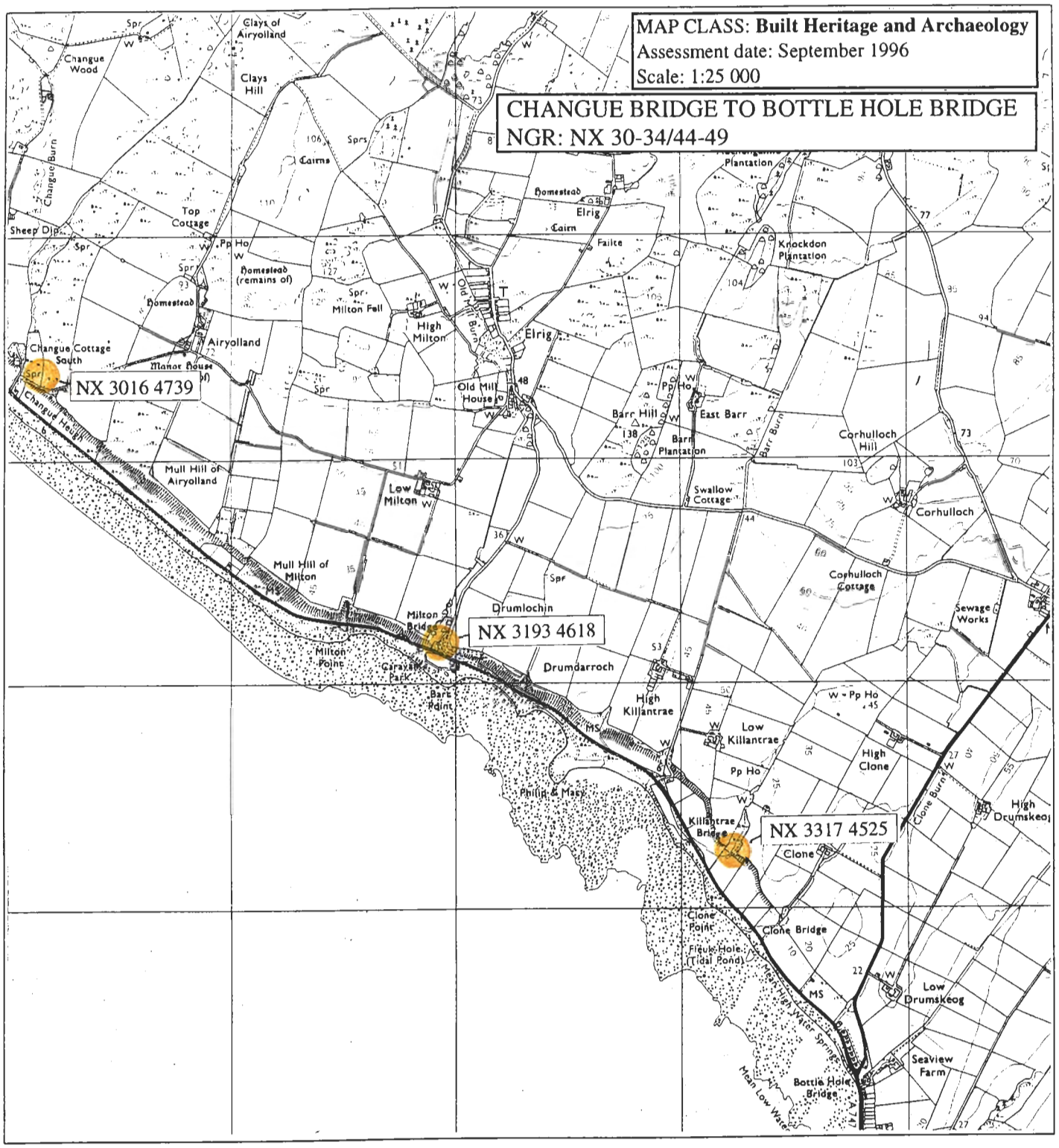
Erosion class	Derwent Code	Colour
Definitely accreting	Prussian Blue	
Accreting/stable	Light Blue	
Stable	Grass Green	
Stable/eroding	Deep Chrome	
Definitely eroding	Deep Vermilion	
Both accreting and eroding	Imperial Purple	
No access	Blank	
Land below 10m	Straw Yellow	

MAP CLASS: **EROSION**
Assessment date: 25.9.96
Scale 1:25 000



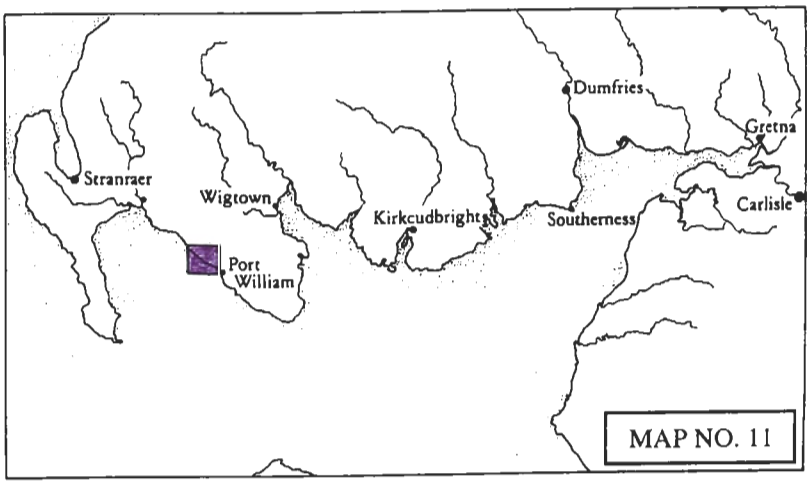
MAP 11: BUILT HERITAGE AND ARCHAEOLOGY

Sites on the Coast Edge & Foreshore	Sites in the Hinterland
None	**NX 3016 4739** CHANGUE HEUGH Possible Rectilinear Enclosure Uncertain Good Nil **NX 3193 4618** MILTON BRIDGE Watermill 19th century Good Nil **NX 3317 4525** KILLANTRAE BRIDGE Track Uncertain Good Nil



KEY

Site location	Symbol	Colour	Significance
NGR ref. - eg. NX 143 368	Roundel - Solid, (or area)	Red	Protected Ancient Monument
	Cross	Red	Listed Historic Building
	Roundel - Open, (or area)	Red	Monument formally proposed by Historic Scotland for designation
NMRS ref. - eg. NX13 SW17	Roundel - Solid, (or area)	Yellow	Other known Ancient Monument
	Dashed outline	Yellow	Gardens/Designed landscape
	Roundel - Solid, (or area)	Yellow	Undesignated wreck
	Area	Green	Insufficient information; more work needed
	Area	Blue	Probably archaeologically sterile



MAP 12: CLONE POINT TO CRAIGENGOUR

Hinterland Geology and Coastal Geomorphology: From Clone Point to Port Whappie the hinterland geomorphology is uniform and consists of raised beach deposits. These become noticeably lower towards Port William and beyond to Port Whappie. From Port Whappie to St Medina's Well the hinterland drift geology changes over to brecciated (clay-dominant) morainic drift deposits. The coastal geomorphology from Clone Point to Port Whappie is exclusively shingle intermixed with sand. Greywacke and interbedded siltstones outcrop at the head of Monreith Bay and at St Medina's Well. Here the foreshore is low lying and predominately sand with shingle banked at the current HWM.

Erosion Class: From Bottle Hole Bridge to Port William Harbour the foreshore has been stabilised by the construction of coastal sea defences. The inside of Port William harbour is definitely accreting owing to the low numbers of craft using the harbour. This is noticeable in the lee of a stone breakwater on the west side of the harbour. At Saltpan Point the sea defences are severely eroded and large boulders have been dumped in an attempt to limit further erosion. At Monrieth Bay the coastal edge is stable.

Built Heritage & Archaeology: The village of Port William is located in this section and includes many listed buildings, ranging in date from the eighteenth to the twentieth centuries, relating to its role as a working port (Graham, 1979, 61-63). Included amongst the listed buildings are harbour stores, a church, a library, a watermill and the harbour itself. All of the sites survive in good condition. Immediately south of the village is a possible salt pan, identified in the field survey, which is suffering from sea abrasion. Further south in Monreith bay are found boat runs and a fish trap which are eroding to a limited extent. Inland from Monreith Bay is Barsalloch Point promontory fort and a sculptured rock at Knock, Glasserton. These sites are more at threat from animal action, in the former, and human impact in the latter. Monitoring is recommended particularly for the sites on the coastal edge south of Port William.

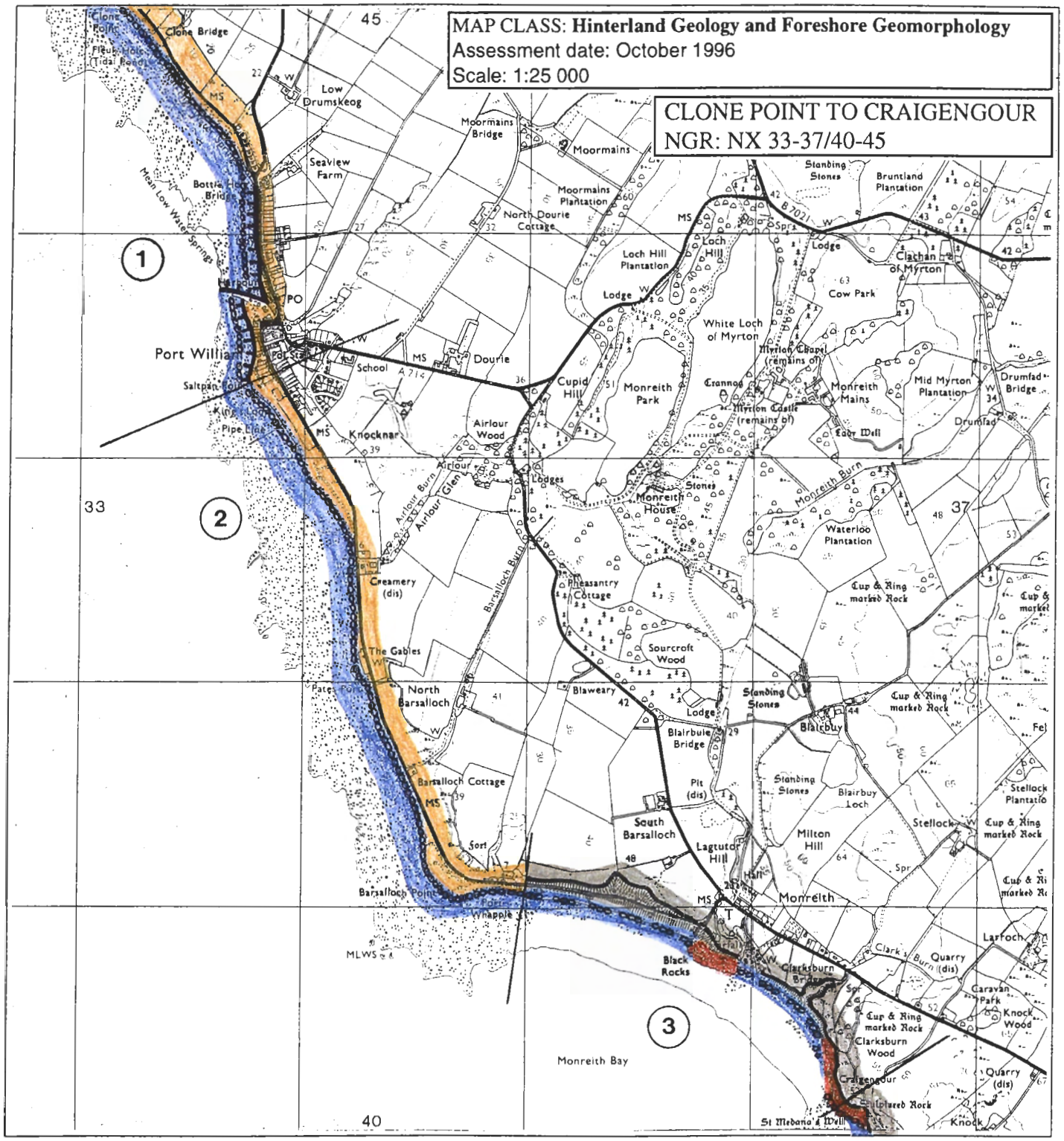
Map 12: Hinterland Geology and Coastal Geomorphology

---

1. MILTON POINT to PORT WILLIAM
NX 333 450
3.2km
Cliff (> 10m)
Mainly raised beach and relict shoreline
Raised beaches run the length of this unit. These tend to be steeper towards West Bar (NX320462) than at Kilantrae Bridge (NX332454) where a wave cut platform occurs on the 10m contour. The foreshore is very wide containing sand bars, shingle beds and large poorly sorted boulders.

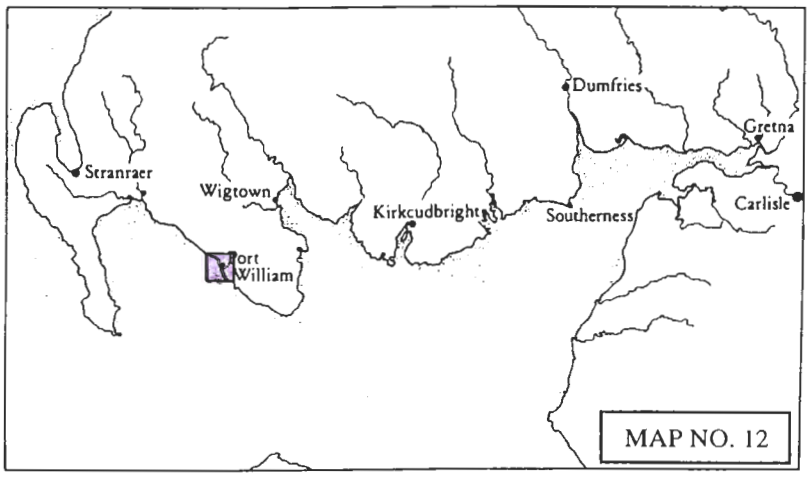
2. PORT WILLIAM to PORT WHAPPIE
NX 344 420
2.4km
Low edge (< 10m)
Marine sand and gravels
Exposed shoreline with a hinterland comprising of marine sands and gravels. The foreshore is wide consisting of shingle at the MHWM with poorly sorted boulders and sand bars down to the MLWS mark.

3. PORT WHAPPIE to ST MEDINA'S WELL
NX 356 410
1.8km
Cliff (< 10m)
Till over visible rock
This unit includes Monreith Bay. The cliffs consist of thin to thick bedded greywackee with interbedded siltstones. These are overlain by a shallow drift deposit of till. the foreshore is wide and consists of patches of boulders and sand bars. Black rock is a platform of outcropping greywackee.



KEY

Hinterland Geology	Derwent Code	Colour
Drift, boulder clay	French Grey	
Drift, boulder clay over visible rock	Dark Violet	
Raised beach and marine deposits	Golden Brown	
Blown sand	Pink Madder Lake	
Glacial sand and gravel	Magenta	
Alluvium	Emerald Green	
Coastal Geomorphology		
Mainly rock platform	Deep vermilion	
Mainly sand	Ultramarine	
Mainly alluvial/marine mud	Venetian Red	
Marsh	May Green	
Coast Edge		
Low edge (<5m)	Thin black line	
Cliff (>5m)	Solid black line	
Man made barrier	Black line with spines	
Shingle beach	Small circles	oooooo
Human disturbance	Black carats	^^^^^^

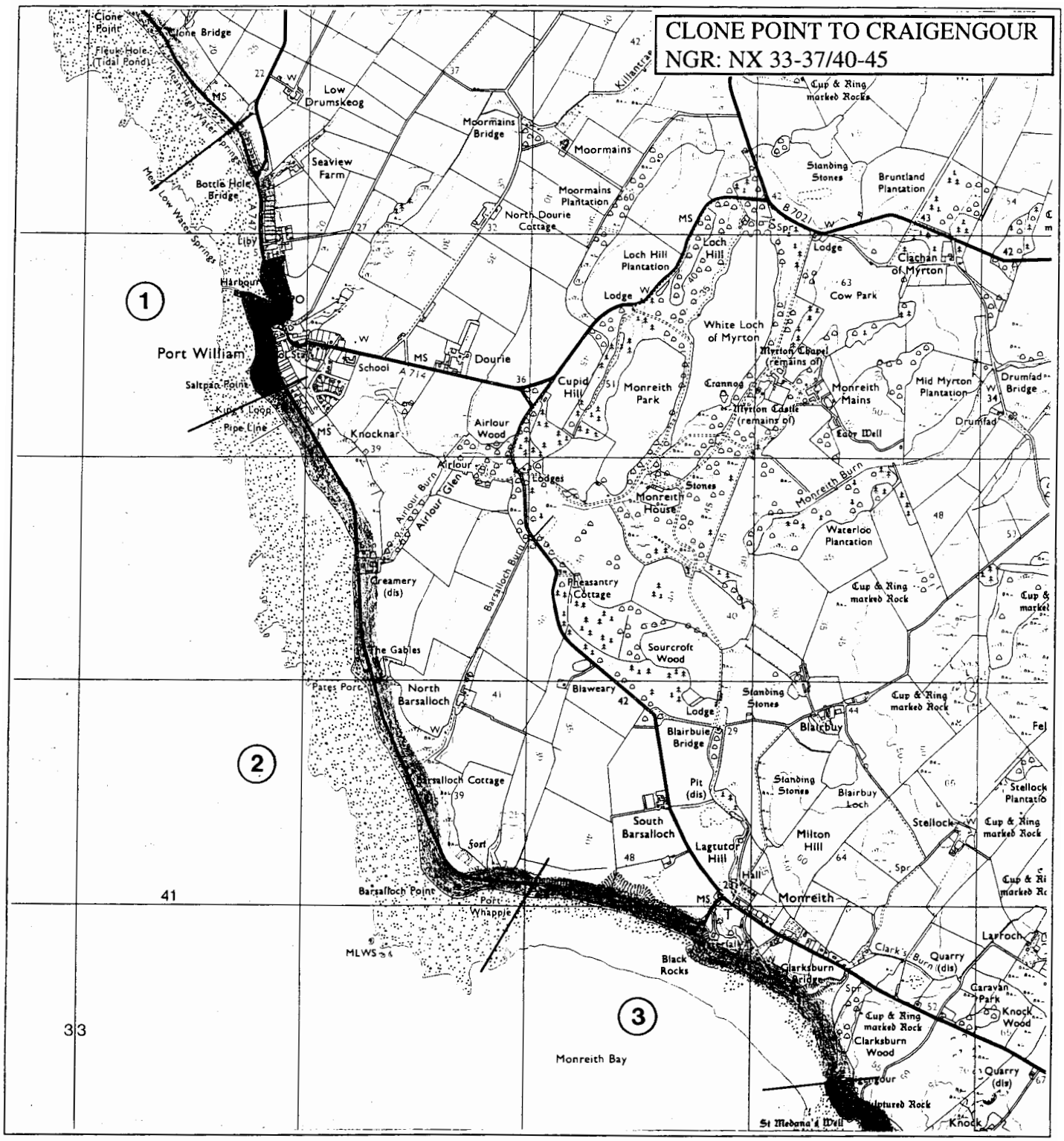


MAP 12: EROSION

1. PORT WILLIAM
NX 338 436
1.2km
Accreting or stable
This unit contains Port William seafront and harbour. The beaches are a mixture of sand and boulders. The inner reach of the harbour is silting up especially in the lee of a stone breakwater wall. Rubble and boulders have been dumped at Saltpan Point (NX337433) in an attempt to reduce erosion.

2. SALTPAN POINT to BARSALLOCH POINT
NX 343 420
2.5km
Accreting or stable
This unit has an unbroken but exposed coastline and a wide foreshore consisting of sand and shingle intermixed with boulders. Sea defence at the old Creamery include armour stone and Rip-Rap. The current HWM is banked with shingle and therefore assumed to stable.

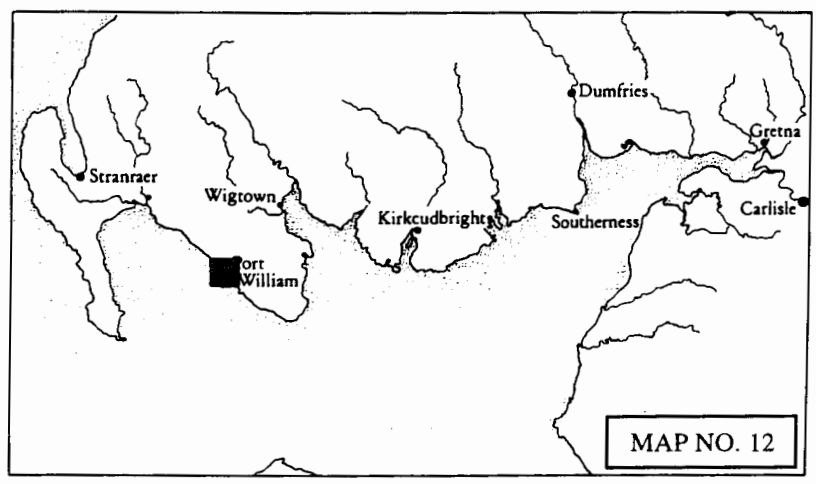
3. MONREITH BAY
NX 354 410
1.5km
Stable
This bay has is partly sheltered by Barsalloch Point from prevailing north westerly winds and appears to be stable. The bay has a wide intertidal zone and is mostly of sand and shingle. Shingle is banked against the current HWM. The beach is prograding further offshore where a well sorted shingle bar is now forming.



KEY

Erosion class	Derwent Code	Colour
Definitely accreting	Prussian Blue	
Accreting/stable	Light Blue	
Stable	Grass Green	
Stable/eroding	Deep Chrome	
Definitely eroding	Deep Vermilion	
Both accreting and eroding	Imperial Purple	
No access	Blank	
Land below 10m	Straw Yellow	

MAP CLASS: **EROSION**
Assessment date: 25.9.96
Scale 1:25 000



MAP 12: BUILT HERITAGE AND ARCHAEOLOGY

Sites on the Coast Edge & Foreshore

NX34SW 20
NX 337 437
PORT WILLIAM
Harbour
18/19th century
Good
Nil

NX34SW 16
NX 3378 4368
PORT WILLIAM
Harbour Store
18/19th century
Good
Nil

NX34SW 15
NX 3382 4366
PORT WILLIAM
Harbour Store
18/19th century
Good
Nil

NX34SW 14
NX 3384 4363
PORT WILLIAM
Harbour Store
18/19th century
Good
Nil

NX 3373 4310
PORT WILLIAM
Salt Pan?
Uncertain
Poor
Survey & Monitor

NX 3510 4090
MONREATH BAY
Boat Runs
Uncertain
Fair
Survey & Monitor

Sites in the Hinterland

NX 3628 4030
MONREITH BAY
Fish Trap
Uncertain
Fair
Survey & Monitor

NX34SE 21
NX 3640 4008
ST MEDANA'S WELL
Spring
Uncertain
Not located
Nil

NX34SW 12
NX 3381 4396
PORT WILLIAM
Library
19/20th century
Good
Nil

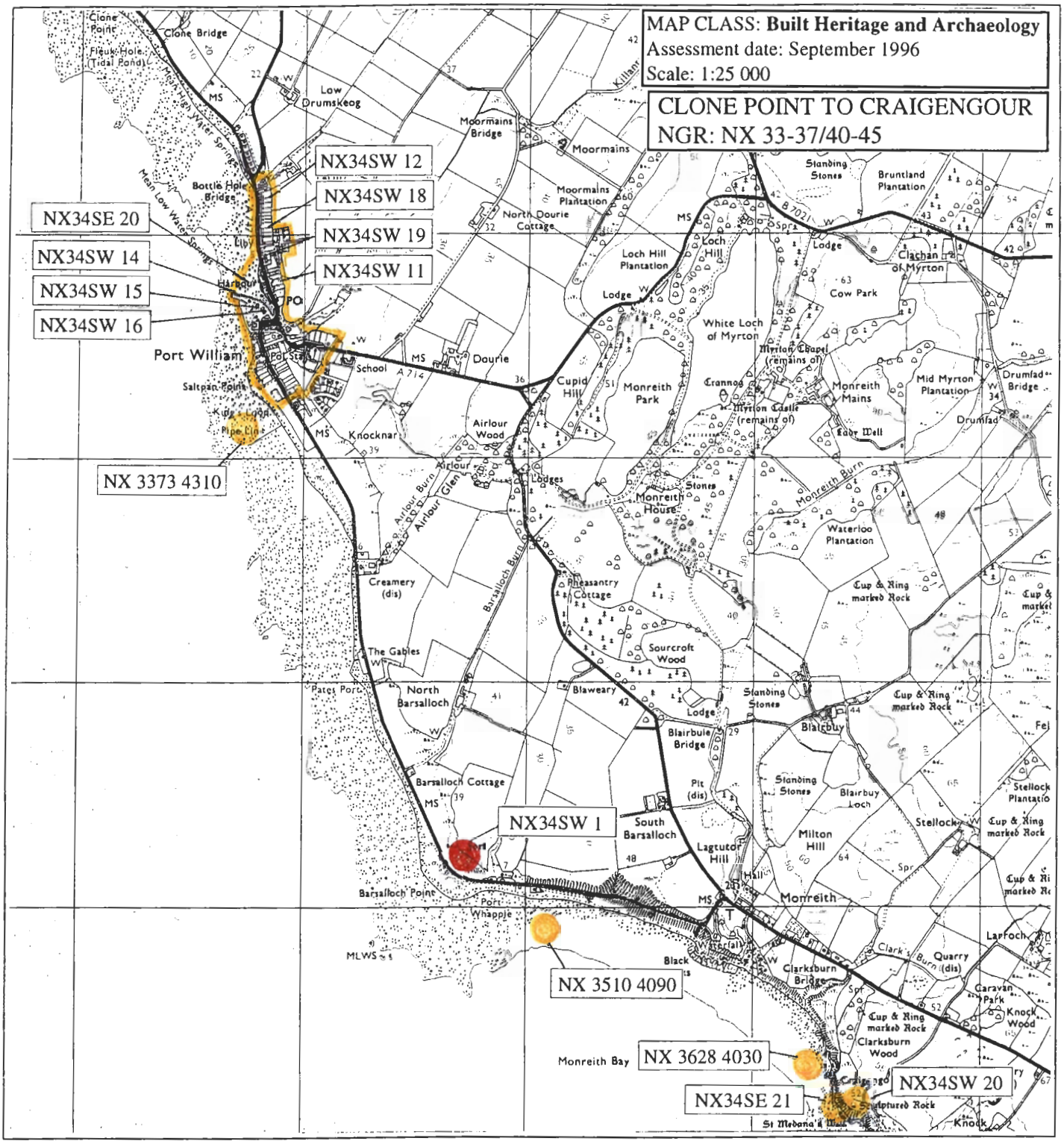
NX34SW 11
NX 3388 4395
PORT WILLIAM
Church
19th century
Good
Nil

NX34SW 18
NX 3382 4383
THE BIELD, PORT WILLIAM
House
18/19th century
Good
Nil

NX34SW 19
NX 3392 4358
PORT WILLIAM
Watermill
18/19th century
Good
Nil

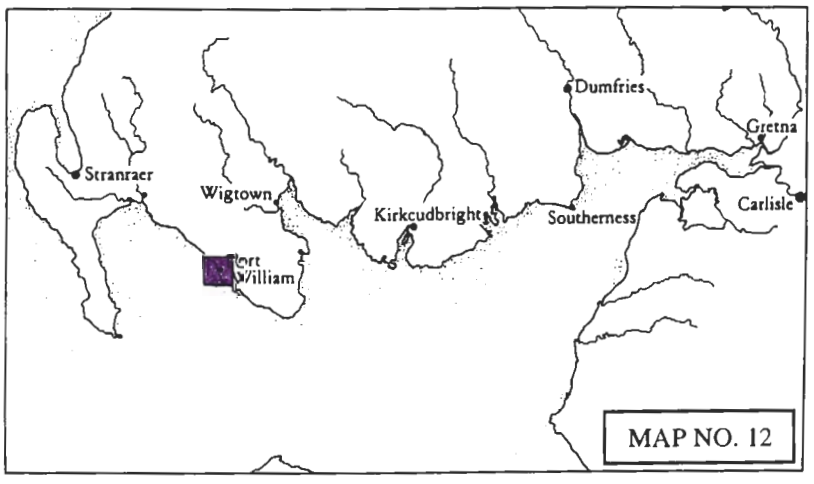
NX34SW 1
NX 3474 4121
BARSALLOCH POINT
Promontory Fort
In the care of Historic Scotland
1st Mill. BC/AD
Good
Nil

NX34SE 20
NX 3645 4012
KNOCK, GLASSERTON
Sculptured Rock
Good
Nil



KEY

Site location	Symbol	Colour	Significance
NGR ref. - eg. NX 143 368	Roundel - Solid, (or area)	Red	Protected Ancient Monument
	Cross	Red	Listed Historic Building
	Roundel - Open, (or area)	Red	Monument formally proposed by Historic Scotland for designation
	Roundel - Solid, (or area)	Yellow	Other known Ancient Monument
NMRS ref. - eg. NX13 SW17	Dashed outline	Yellow	Gardens/Designed landscape
	Roundel - Solid, (or area)	Yellow	Undesignated wreck
	Area	Green	Insufficient information: more work needed
	Area	Blue	Probably archaeologically sterile



MAP 13: CRAIGENGOUR TO LAGGAN CAMP

Hinterland Geology and Coastal Geomorphology: This section of the coast includes the exposed promontory headland called the Point of Lagg south-east to Laggan Camp. The promontory headland is covered with morainic drift deposits which give way to till over exposed rock from Truff Cave to Point of Cairndoon. In this region the cliff-edge becomes very incised. Beyond the Point of Cairndoon, raised beach deposits occur eastwards to Laggan Camp. The foreshore is uniform with sand and poorly sorted boulders for much of this region. Rock platform occurs to the west of the Point of Cairndoon which overlooks a beach with shingle at the current HWM.

Erosion Class: Point of Lag is both stable with some erosion. East of the Point of Cairndoon the rocky shore is definitely eroding albeit at a slow rate owing to the resilience of the greywackee outcrop. Further east from this area, the beach has evidence of accretion as shingle is banking up at the current HWM.

Built Heritage & Archaeology: This section includes landing places at Back Bay and Front Bay, a later prehistoric promontory fort also at Back Bay, a medieval church at Kirkmaiden and a disused farmshed at Knockguisha. The church and farmshed are located inland and are not threatened by coastal erosion. The sites situated on the coastal edge, which were identified in the field survey however, are suffering from coastal erosion. It is recommended that both Back Bay promontory fort and Front Bay landing place be surveyed and monitored.

Map 13: Hinterland Geology and Coastal Geomorphology

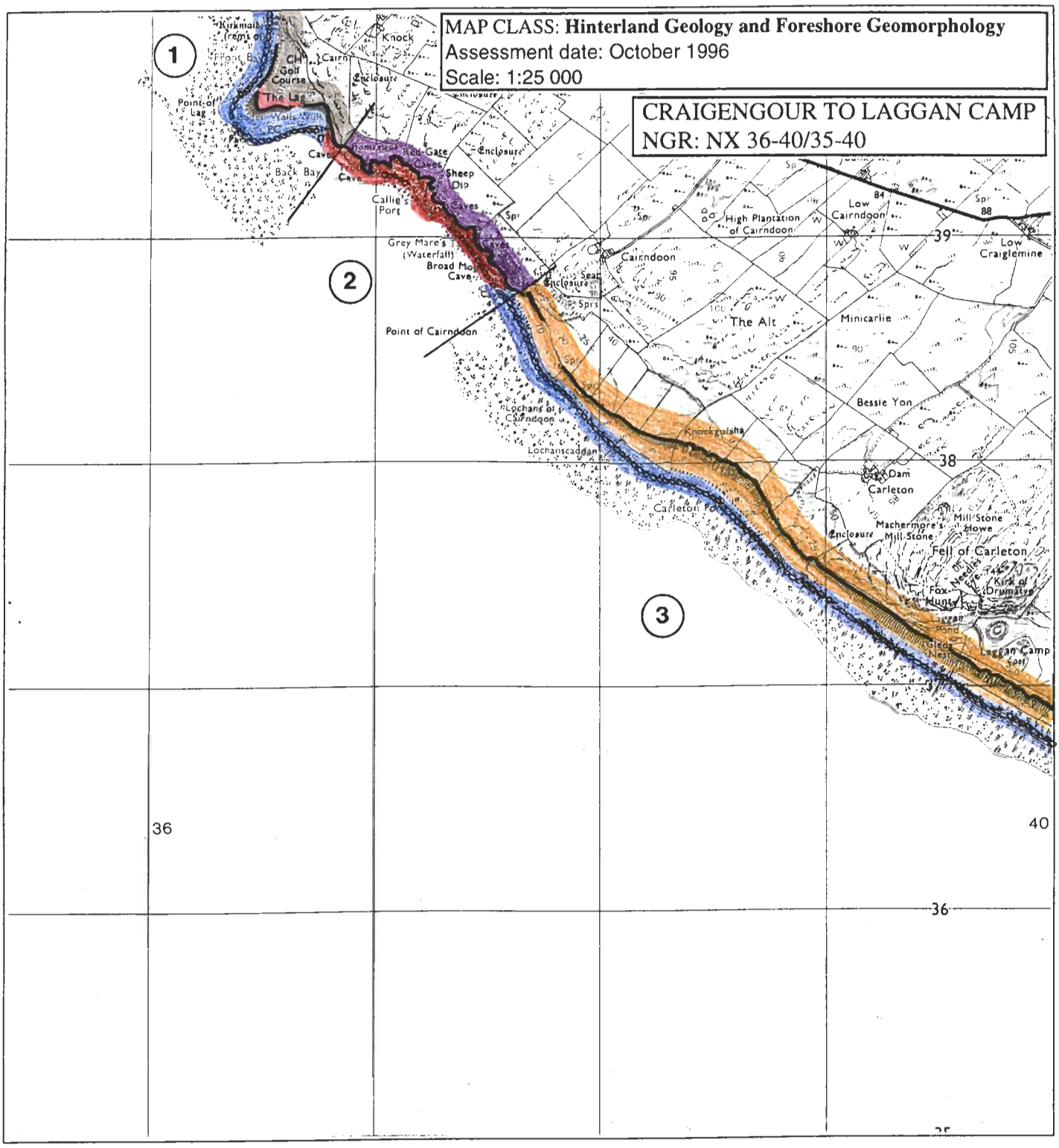
1. ST MEDENA'S WELL to TRUFF CAVE
NX 365 396
0.8km
Cliff (< 10m)
Mainly till and blown sand
This is an exposed promontory headland consisting of undulating blown sand with drift derived till over the steeper cliff edge. The foreshore is predominately banked shingle which gives way to extensive boulder beds intermixed with sand and marine shell deposits.

2. TRUFF CAVE to POINT OF CAIRNDOON
NX 375 392
1km
Cliff (< 10m)
Till over exposed rock
Irregular cliff edge overlain by till. The cliffs contain sea- caves and consist of greywackee interbedded with silty mud stones. The foreshore is sandy with poorly sorted boulders and shingle.

3. POINT of CAIRNDOON to PORT OF COUNAN
NX 385 380
4 km
Cliff (> 10m)
Raised beach with marine sand and gravels
This exposed region of the coastline contains impressive raised beaches formed from marine deposits. The raised beach becomes noticeably steeper towards the east (max 61m). A plateau exists in front of the beach formed by marine sand and shingle. The foreshore is wide and contains mainly large boulders, cobbles and sand.

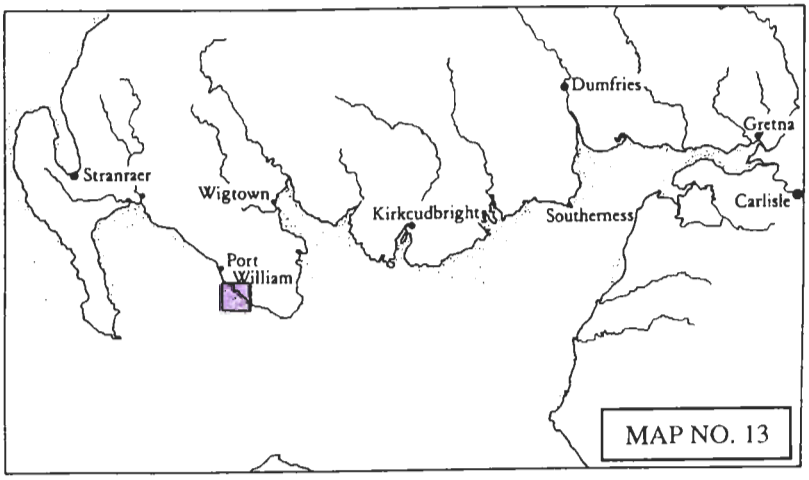
MAP CLASS: **Hinterland Geology and Foreshore Geomorphology**
Assessment date: October 1996
Scale: 1:25 000

CRAIGENGOUR TO LAGGAN CAMP
NGR: NX 36-40/35-40



KEY

Hinterland Geology	Derwent Code	Colour
Drift, boulder clay	French Grey	
Drift, boulder clay over visible rock	Dark Violet	
Raised beach and marine deposits	Golden Brown	
Blown sand	Pink Madder Lake	
Glacial sand and gravel	Magenta	
Alluvium	Emerald Green	
Coastal Geomorphology		
Mainly rock platform	Deep vermilion	
Mainly sand	Ultramarine	
Mainly alluvial/marine mud	Venetian Red	
Marsh	May Green	
Coast Edge		
Low edge (<5m)	Thin black line	
Cliff (>5m)	Solid black line	
Man made barrier	Black line with spines	
Shingle beach	Small circles	oooooo
Human disturbance	Black carats	^^^^^^

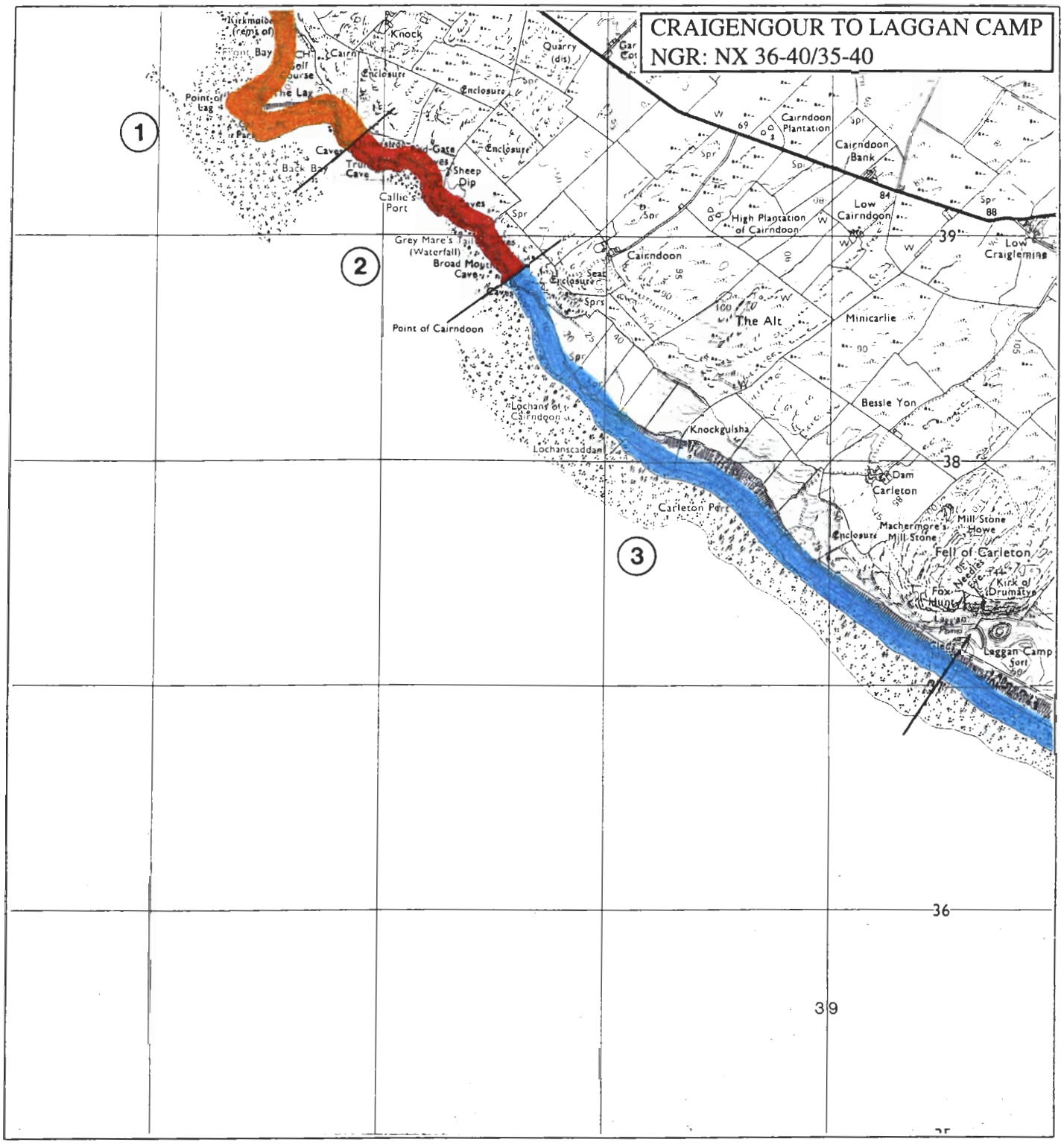


MAP 13: EROSION

1. CRAIGENGOUR to TRUFF CAVE
NX 364395
0.8km
Eroding or stable
This unit includes an exposed promontory headland with a wide intertidal area with large boulders and shingle. The shore cliff edge is till and is eroding due to slope failure and accelerated mass-movement.

2. TRUFF CAVE to BROAD MOUTH CAVE
NX 375395
0.8km
Eroding or stable
This region of coastline consists of an irregular deeply incised cliff-edge. Boulders derived from cliff falls are being abraded at the base of the cliffs, especially along gullies that have formed as a result of high wave impact. The scale of erosion is hard to predict but it appears to be continuously slow.

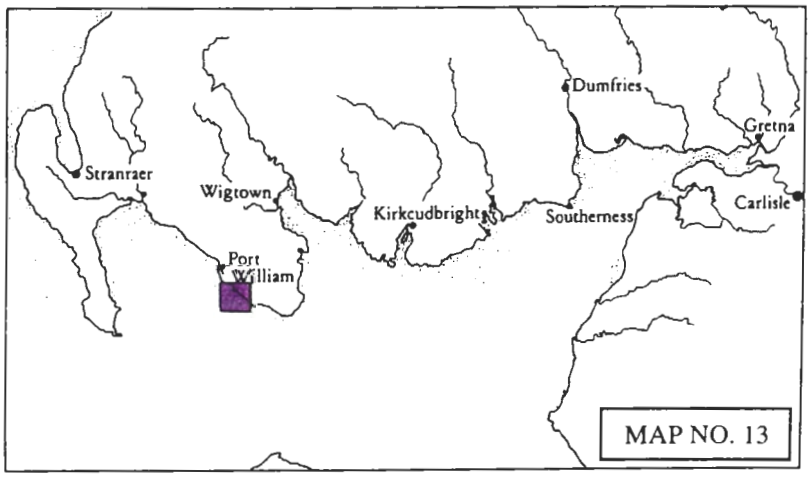
3. POINT OF CAIRNDOON to GLEDS NEST
NX 384 380
1.8km
Accreting or stable
This unit consists of a wide intertidal zone backed by steep raised beaches. The beach is dominated by shingle that is banked up at the current HWM suggesting an element of accretion.



KEY

Erosion class	Derwent Code	Colour
Definitely accreting	Prussian Blue	
Accreting/stable	Light Blue	
Stable	Grass Green	
Stable/eroding	Deep Chrome	
Definitely eroding	Deep Vermilion	
Both accreting and eroding	Imperial Purple	
No access	Blank	
Land below 10m	Straw Yellow	

MAP CLASS: **EROSION**
Assessment date: 26.9.96
Scale 1:25 000



MAP 13: BUILT HERITAGE AND ARCHAEOLOGY

Sites on the Coast Edge & Foreshore

NX 3630 3984
FRONT BAY
Landing Places
Uncertain
Poor
Survey & Monitor

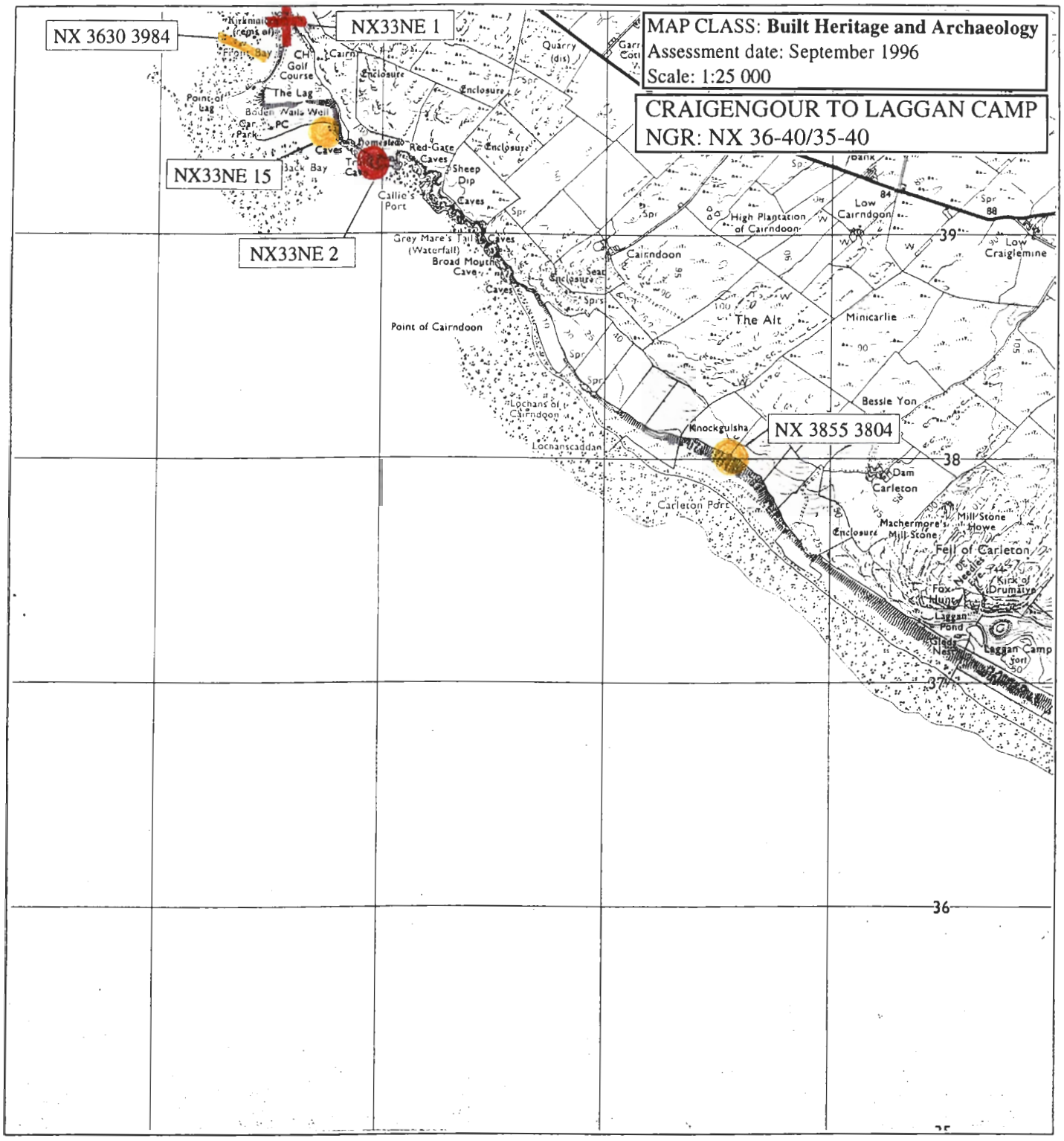
NX33NE 15
NX 367 394
BACK BAY
Landing Places
Uncertain
Uncertain; not visited
Nil

NX33NE 2
NX 3696 3932
BACK BAY
Promontory Fort
Scheduled Ancient Monument
1st Mill. BC/AD
Poor
Survey & Monitor

Sites in the Hinterland

NX33NE 1
NX 3655 3992
KIRKMAIDEN
Church
Statutory Listed Building
10/11th century
Good
Nil

NX 3855 3804
KNOCKGUISHA
Disused Farmshed
18/19th century
Good
Nil



KEY

Site location	Symbol	Colour	Significance
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	Cross	Red	Listed Historic Building
	Roundel - Open, (or area)	Red	Monument formally proposed by Historic Scotland for designation
NMRS ref. - eg. NX13 SW17	Roundel - Solid, (or area)	Yellow	Other known Ancient Monument
	Dashed outline	Yellow	Gardens/Designed landscape
	Roundel - Solid, (or area)	Yellow	Undesignated wreck
	Area	Green	Insufficient information; more work needed
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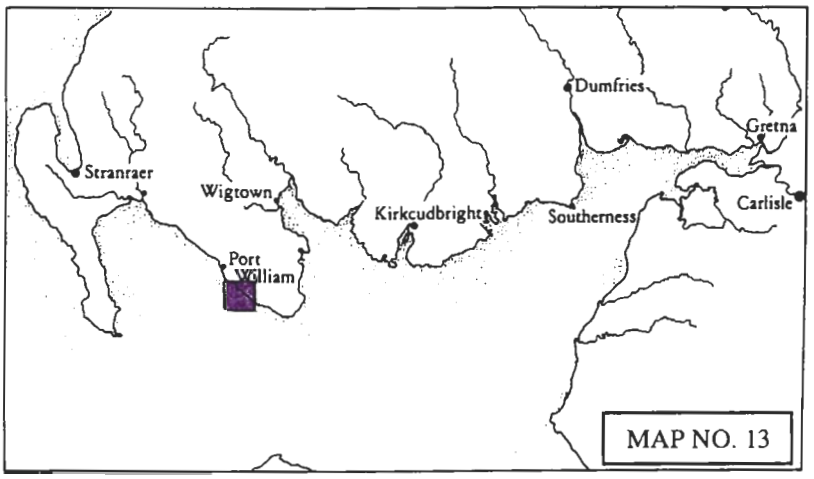
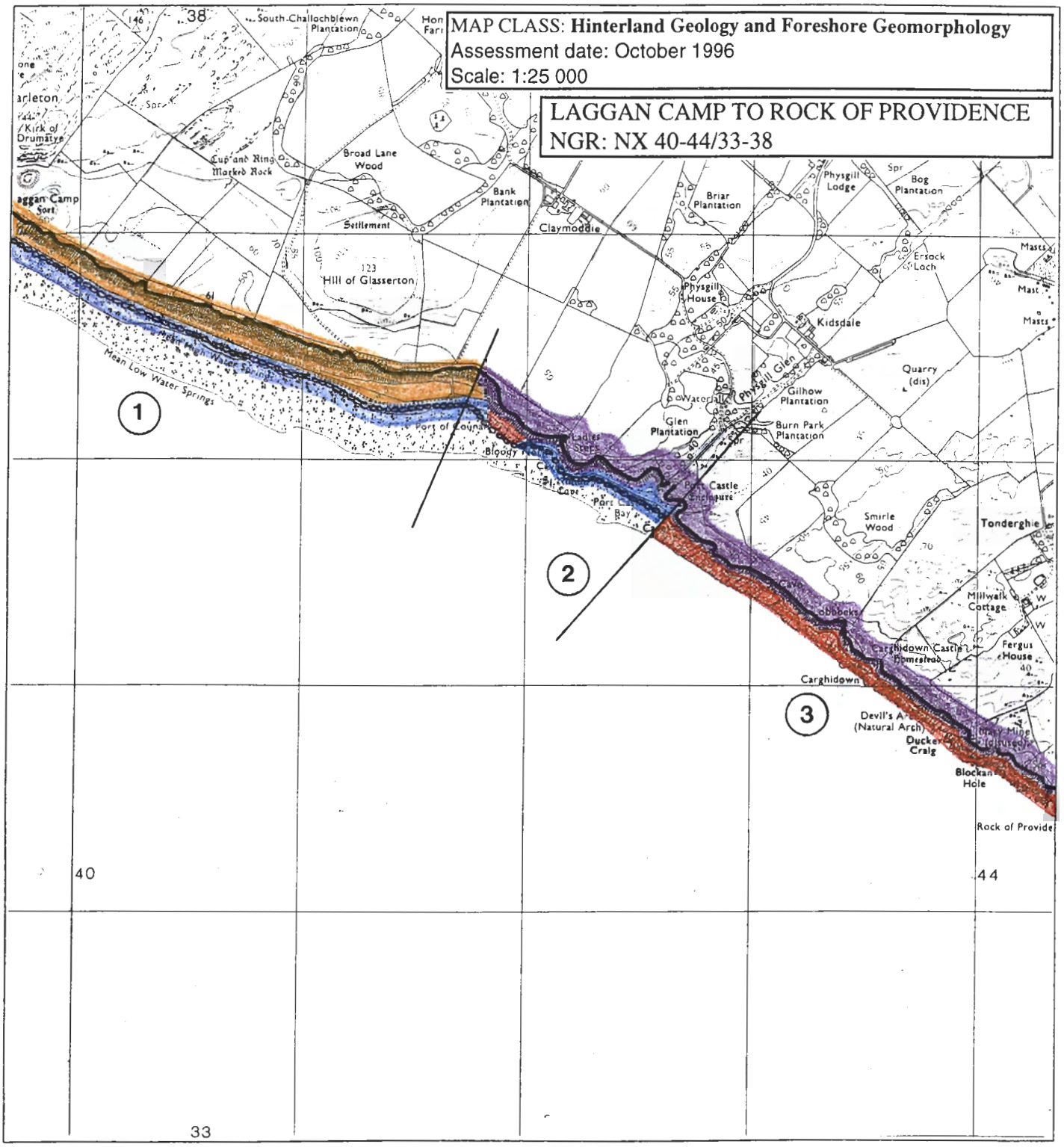


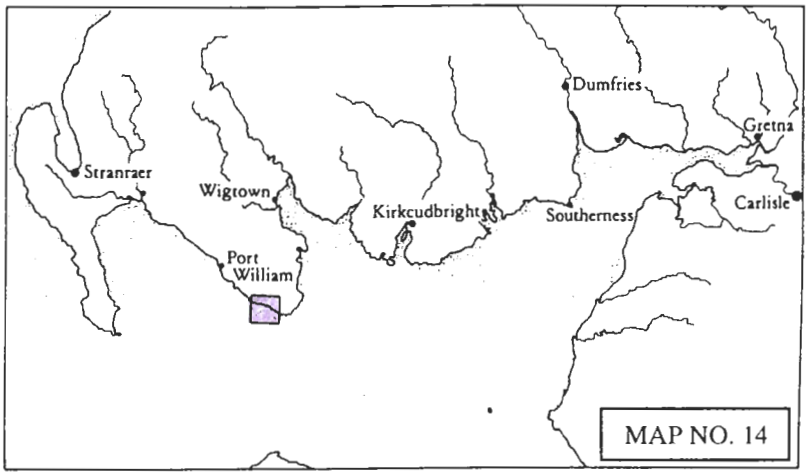
MAP CLASS: **Hinterland Geology and Foreshore Geomorphology**
Assessment date: October 1996
Scale: 1:25 000

LAGGAN CAMP TO ROCK OF PROVIDENCE
NGR: NX 40-44/33-38



KEY

Hinterland Geology	Derwent Code	Colour
Drift, boulder clay	French Grey	
Drift, boulder clay over visible rock	Dark Violet	
Raised beach and marine deposits	Golden Brown	
Blown sand	Pink Madder Lake	
Glacial sand and gravel	Magenta	
Alluvium	Emerald Green	
Coastal Geomorphology		
Mainly rock platform	Deep vermilion	
Mainly sand	Ultramarine	
Mainly alluvial/marine mud	Venetian Red	
Marsh	May Green	
Coast Edge		
Low edge (<5m)	Thin black line	
Cliff (>5m)	Solid black line	
Man made barrier	Black line with spines	
Shingle beach	Small circles	
Human disturbance	Black carats	



Map 14: LAGGAN CAMP TO ROCK OF PROVIDENCE

Hinterland Geology and Coastal Geomorphology: Raised beach deposits continue in the hinterland as far as Port of Counan. Eastwards from this region, till overlies exposed rock. The coastline as far as Bloody Neuk (NX 419361) is wide and consists of poorly sorted boulders intermixed with sand. Beyond this point the cliff-edge is very precipitous and overlooks deep gullies between rock platforms. A fault line occurs at Port Castle Bay enclosing the Carchidown Formation characterised by greywackees of the Hawick Group (Stone 1996, 105).

Erosion Class: The foreshore from Laggan Camp south-east to Port Castle is wide and appears to be stable as there are noticeable banks of shingle at the current HWM. This is in all probability being brought up to the location as a result of the low horizontal gradient down to the LWMS. This region of coast has a south westerly aspect and is exposed to wave induced mass movement. However at the present this particular section of the coast is accreting and stable. East of this stable region, sheer greywacke cliffs back rock platforms. These are fairly resilient but the upper portion of the cliff face is prone to recession due to weathering of the cliff-edge by wind, rain and spray.

Built Heritage & Archaeology: Included in this section are sites ranging in date from the first millennium BC/AD to the eighteenth and nineteenth centuries. Port Castle, an enigmatic enclosure near St Ninian's Cave, and a mineshaft at Mary Mine are located inland and are not threatened by coastal erosion. St Ninian's Cave, Port Castle landing place, Carghidown promontory fort and Mary Mine are located on the coastal edge. It is recommended that St Ninian's Cave and Carghidown promontory fort be monitored for coastal erosion and storm damage. Attention should also be drawn the impact of tourists at St Ninian's Cave and the impact of animal burrows at Carghidown.

Map 14: Hinterland Geology and Coastal Geomorphology

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1. POINT of CAIRNDOON to PORT OF COUNAN
NX 385 380
4 km
Cliff (> 10m)
Raised beach with marine sand and gravels
This exposed region of the coastline contains impressive raised beaches formed from marine deposits. The raised beach becomes noticeably steeper towards the east (max 61m). A plateau exists in front of the beach formed by marine sand and shingle. The foreshore is wide and contains mainly large boulders, cobbles and sand.

2. PORT OF COUNAN to PORT CASTLE
NX 425 359
0.8km
Cliff (> 10m)
Till over exposed rock platform
A highly indented irregular precipitous cliff-edge covered by till. A break in the rock platform occurs at the Port Castle Bay which forms a fault zone enclosing the Carghidown Formation of greywackees.

3. PORT CASTLE to DUCKER ROCK
NX 465 344
2.3km
Cliff (> 10m)
Till over visible rock
The cliff edge is highly indented and sea-caves occur. Till overlays the highly fractured cliff-edge.

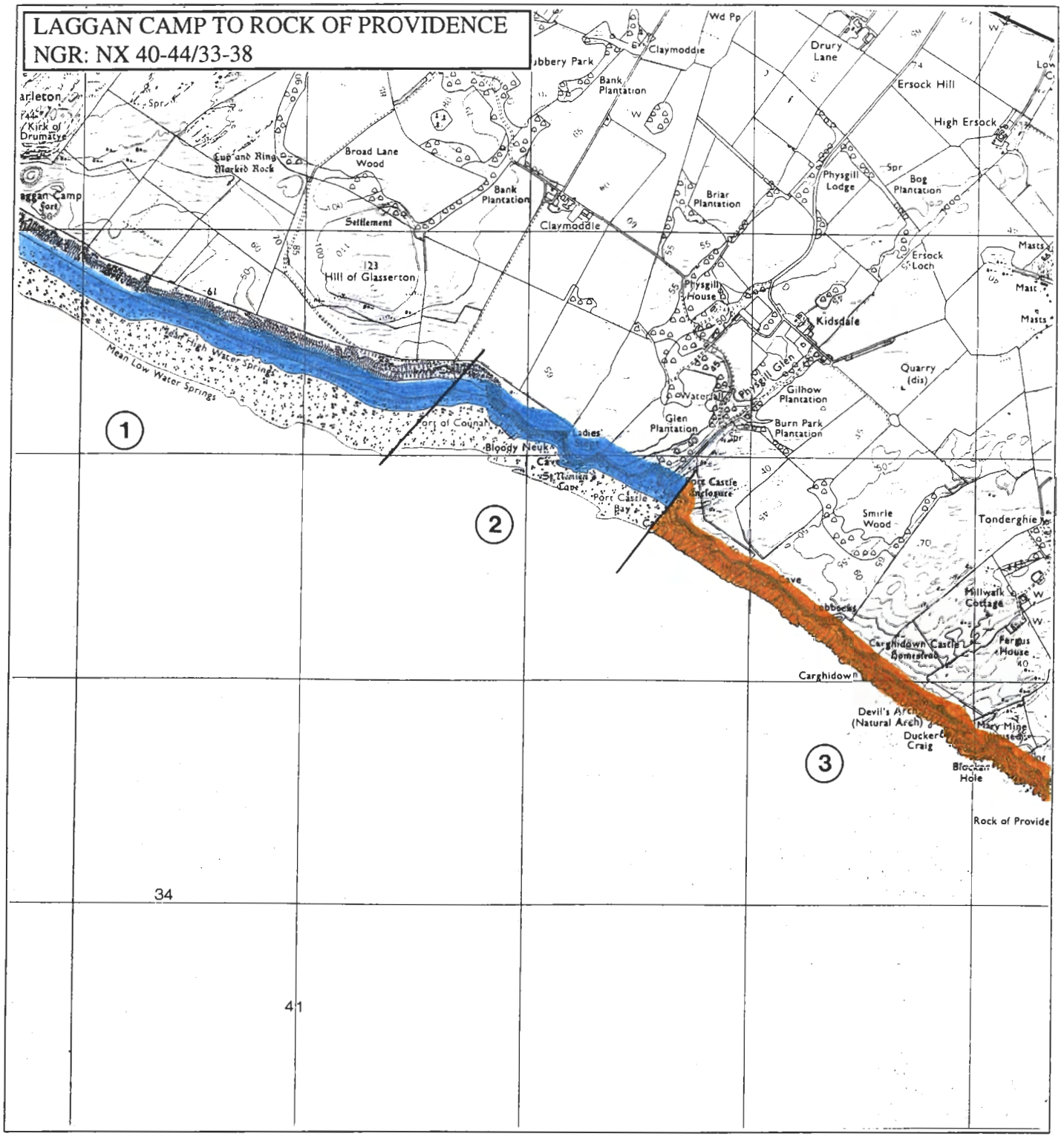
MAP 14: EROSION

1. GLEDS NEST to north west of LADIES STEPS
NX 410 364
3.3k
Accreting or stable
This unit is backed by a discontinuous high cliff-edge consisting of marine deposits and till. The intertidal area is wide and mostly shingle which is banking up at the current HWM and is therefore accreting and for now stable.

2. LADIES STEPS
NX 423 360
1.1km
Accreting or stable
This unit contains an irregular slope-over-wall cliff-edge. The intertidal area is wide and covered with shingle which is building up into ridges at the current HWM which suggests stability and accretion.

3. PORT CASTLE to BURROW HEAD
NX 454 342
3.7km
Eroding or stable
Incised high irregular cliff-edge with exposed rock outcrops offshore. The base of the cliffs have been eroded into numerous precipitous gullies. Cliff-edge retreat is hard to establish but it is estimated to be slow.

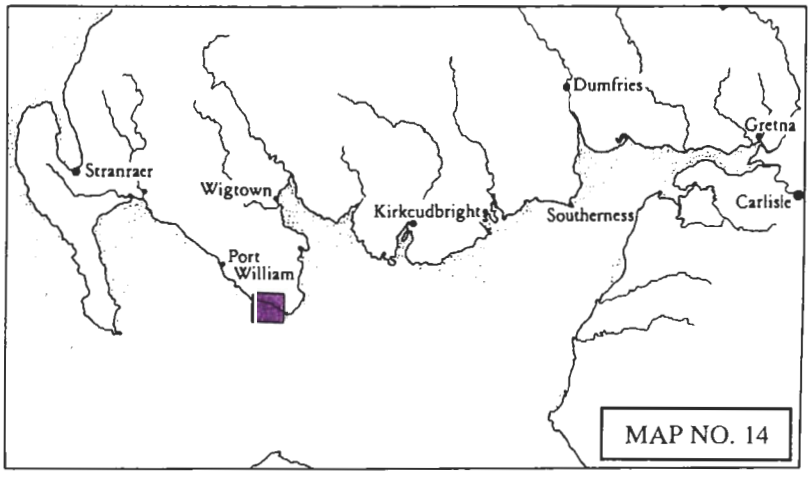
LAGGAN CAMP TO ROCK OF PROVIDENCE
NGR: NX 40-44/33-38



KEY

Erosion class	Derwent Code	Colour
Definitely accreting	Prussian Blue	
Accreting/stable	Light Blue	
Stable	Grass Green	
Stable/eroding	Deep Chrome	
Definitely eroding	Deep Vermilion	
Both accreting and eroding	Imperial Purple	
No access	Blank	
Land below 10m	Straw Yellow	

MAP CLASS: **EROSION**
Assessment date: 26.9.96
Scale 1:25 000



MAP 14: BUILT HERITAGE AND ARCHAEOLOGY

Sites on the Coast Edge & Foreshore

NX43NW 9
NX 4224 3595
ST NINIAN'S CAVE
Cave & Incised Crosses
Scheduled Ancient Monument
5 to 11th centuries AD
Fair
Monitor

NX43NW 34
NX 4256 3582
PORT CASTLE
Landing Place
Uncertain
Uncertain; not located
Nil

NX43NW 8
NX 4356 3507
CARGHIDOWN
Promontory Fort
1ST Mill BC/AD
Poor
Survey & Monitor

NX 4392 3476
MARY MINE
Disused mine shaft
18/19th century
Fair
Nil

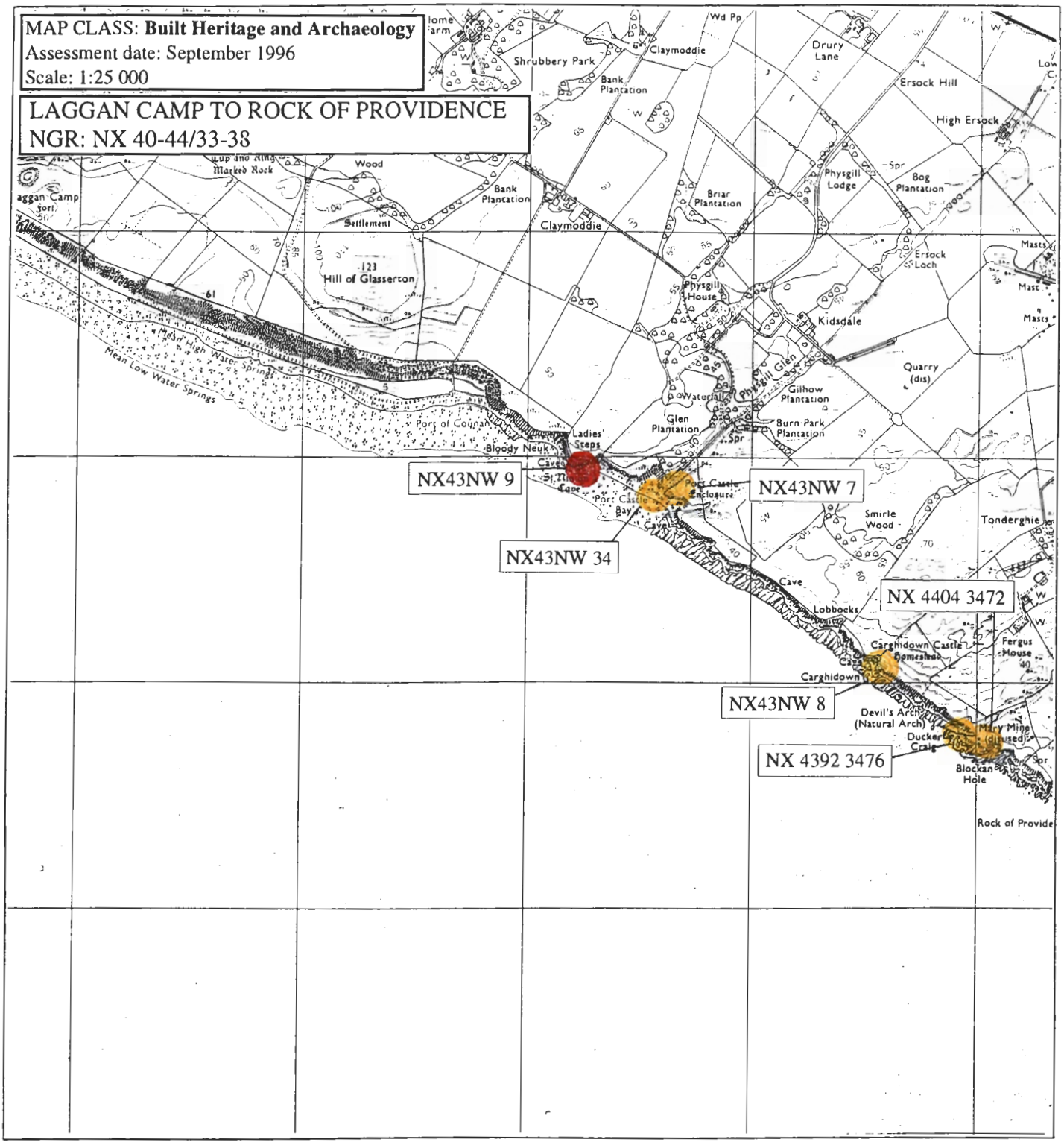
Sites in the Hinterland

NX43NW 7
NX 4266 3584
PORT CASTLE
Castle / Enclosure
Uncertain
Good
Nil

NX 4404 3472
MARY MINE
Disused mine shaft
18/19th century
Good
Nil

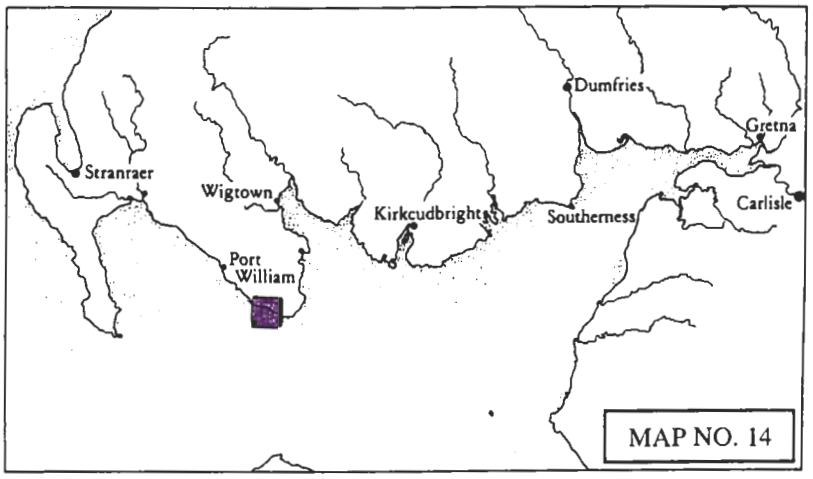
MAP CLASS: **Built Heritage and Archaeology**
Assessment date: September 1996
Scale: 1:25 000

LAGGAN CAMP TO ROCK OF PROVIDENCE
NGR: NX 40-44/33-38



KEY

Site location	Symbol	Colour	Significance
NGR ref. - eg. NX 143 368	Roundel - Solid, (or area)	Red	Protected Ancient Monument
	Cross	Red	Listed Historic Building
	Roundel - Open, (or area)	Red	Monument formally proposed by Historic Scotland for designation
	Roundel - Solid, (or area)	Yellow	Other known Ancient Monument
NMRS ref. - eg. NX13 SW17	Dashed outline	Yellow	Gardens/Designed landscape
	Roundel - Solid, (or area)	Yellow	Undesignated wreck
	Area	Green	Insufficient information; more work needed
	Area	Blue	Probably archaeologically sterile



MAP 15: PORT CASTLE TO DYKEFOOT

Hinterland Geology and Coastal Geomorphology: The hinterland geomorphology consists exclusively of till over exposed rock with a high cliff-edge. From Port Castle south-east to Ducker Rock the coastline is incised and overlooks rock platform. Sea-caves, arches and off-shore pinnacles occur within this region. Burrow Head forms an exposed promontory headland. There is no noticeable change in the uniform character of the hinterland geomorphology as one travels eastwards until Screen Point (see Map 16).

Erosion Class: This region of the coast appears to be eroding extremely slowly owing to the resilient nature of the greywackee geology. The rate of basal erosion of the cliffs is hard to estimate as there is no foreshore accessible on this region of coastline. Erosion by wind, rain and spray is occurring owing to the exposed aspect of the region.

Built Heritage & Archaeology: A cluster of sites survive at Burrow Head and can be separated into two groups; one ranging in date from the first millennium BC/AD through to the medieval period, and the other belonging to World War 2. The first group includes Castle Feather promontory fort and castle, the Burrow Head promontory forts, and possibly an earthwork. All four sites are suffering coastal erosion, and surveying and monitoring are recommended. In the case of the Burrow Head promontory forts, severe human impact, in the form of visitor paths and farming, is detrimentally affecting the ramparts of both sites. The second group of sites belong to the Second World War Gun Emplacements at Burrow Head. These include concrete 'gun holdfasts' (Lowry, 1995, 54) and a pillbox. Only the pillbox is badly affected by coastal erosion but the lack of data regarding the gun emplacements in the NMRS prompts the recommendation that both these sites be surveyed and monitored.

Map 15: Hinterland Geology and Coastal Geomorphology

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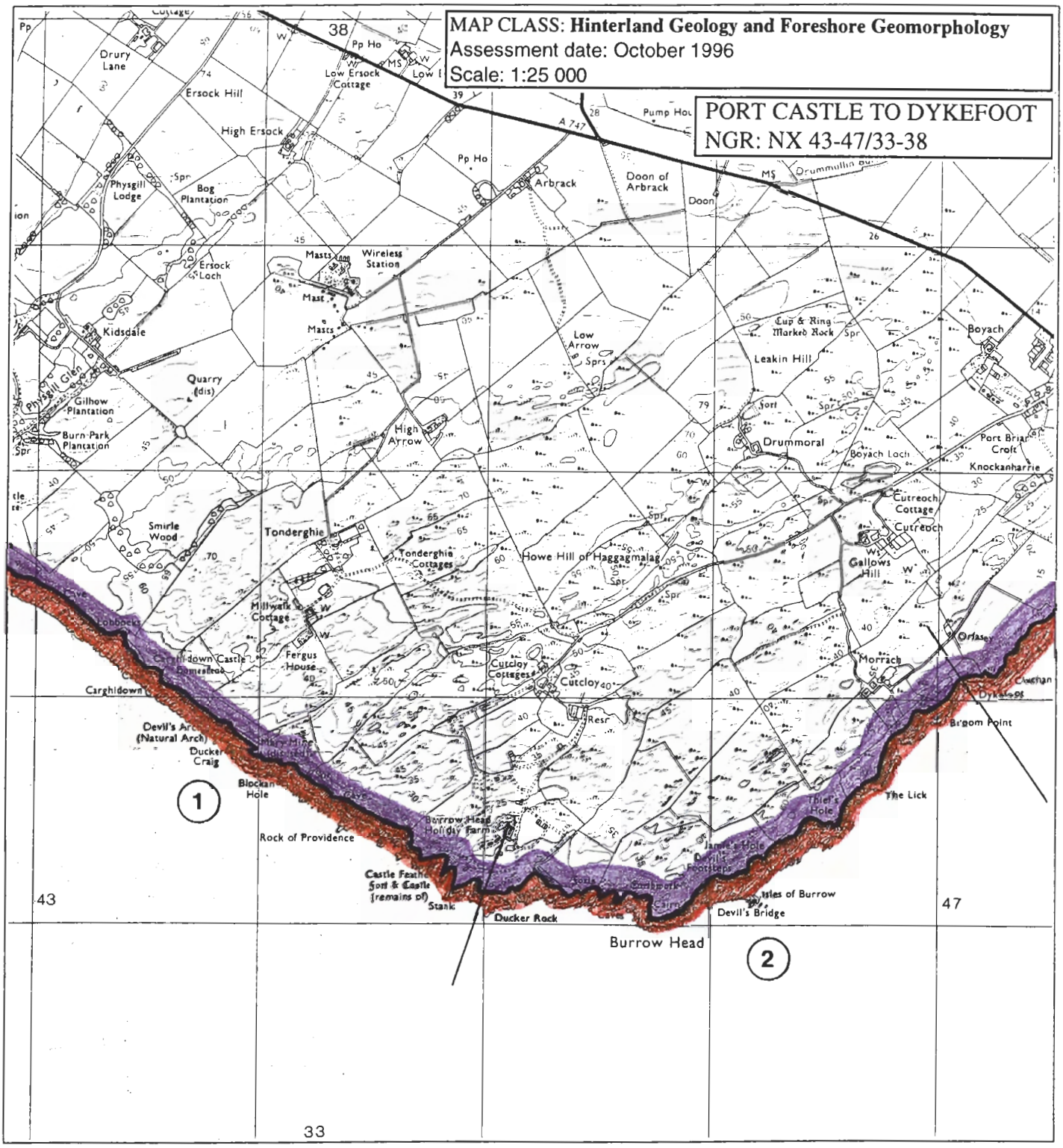
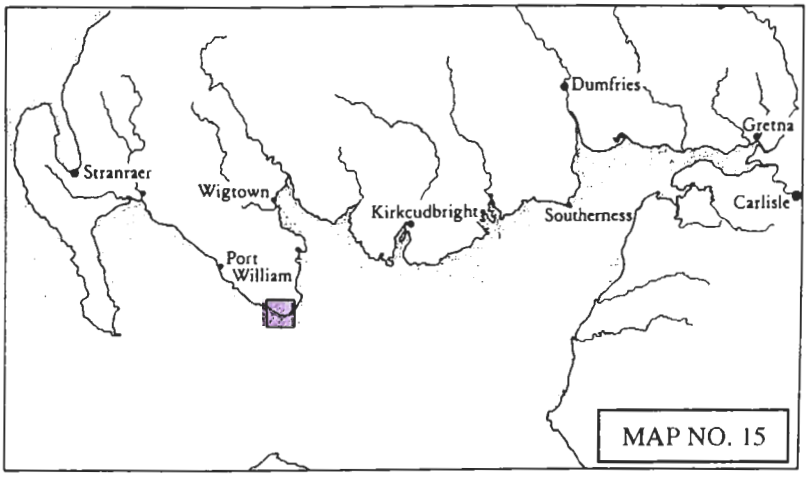
1. PORT CASTLE to DUCKER ROCK
NX 465 344
2.3km
Cliff (> 10m)
Till over visible rock
The cliff edge is highly indented and sea-caves occur. Till overlays the highly fractured cliff-edge.

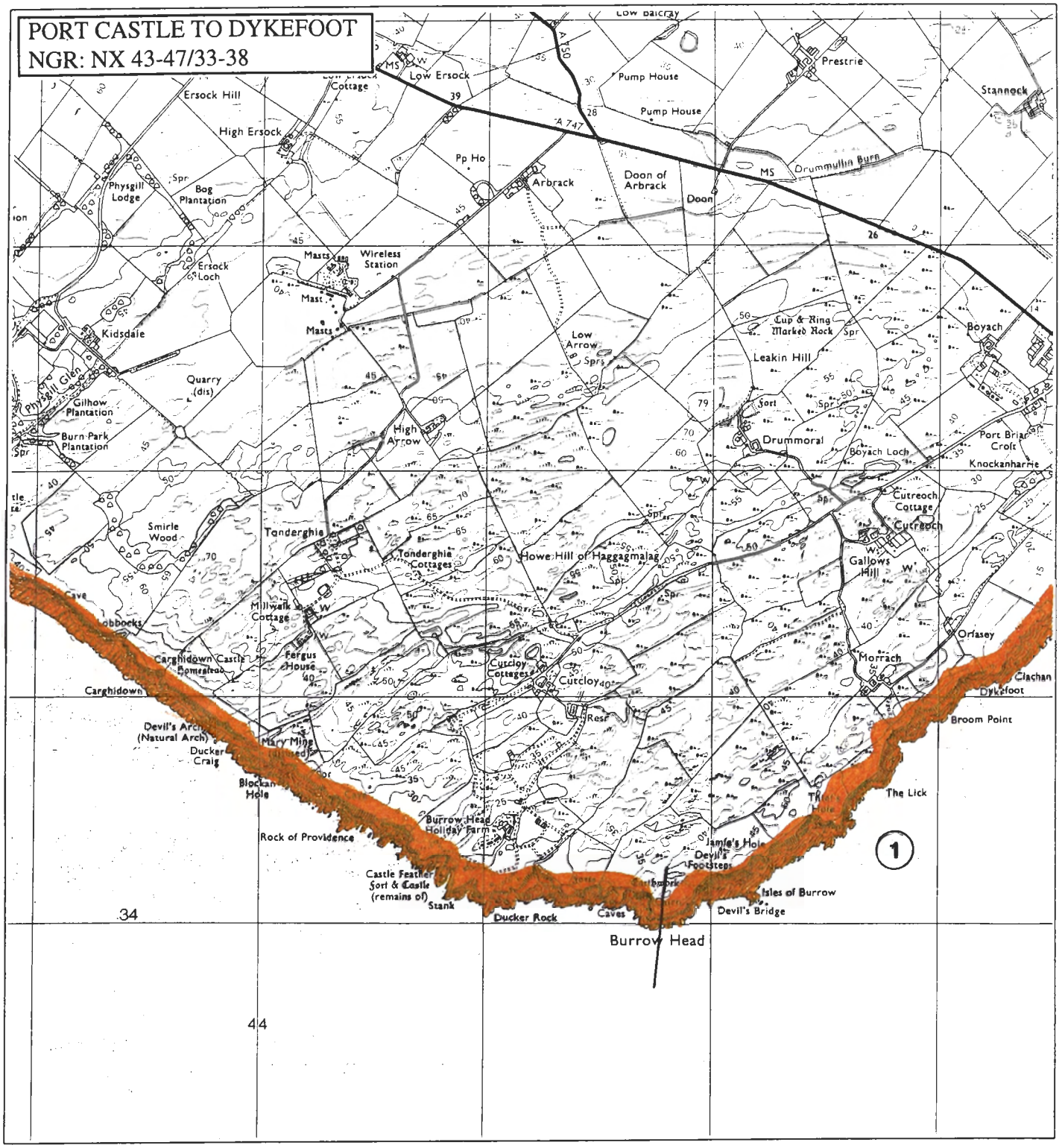
2. DUCKER ROCK to DYKEFOOT
NX 460 343
2.5km
Cliff (> 10)
Till over visible rock
Burrow Head is an exposed promontory headland with a precipitous cliff-edge overlooking exposed rock platform.



KEY

Hinterland Geology	Derwent Code	Colour
Drift, boulder clay	French Grey	
Drift, boulder clay over visible rock	Dark Violet	
Raised beach and marine deposits	Golden Brown	
Blown sand	Pink Madder Lake	
Glacial sand and gravel	Magenta	
Alluvium	Emerald Green	
Coastal Geomorphology		
Mainly rock platform	Deep vermilion	
Mainly sand	Ultramarine	
Mainly alluvial/marine mud	Venetian Red	
Marsh	May Green	
Coast Edge		
Low edge (<5m)	Thin black line	
Cliff (>5m)	Solid black line	
Man made barrier	Black line with spines	
Shingle beach	Small circles	oooooo
Human disturbance	Black carats	^^^^^^

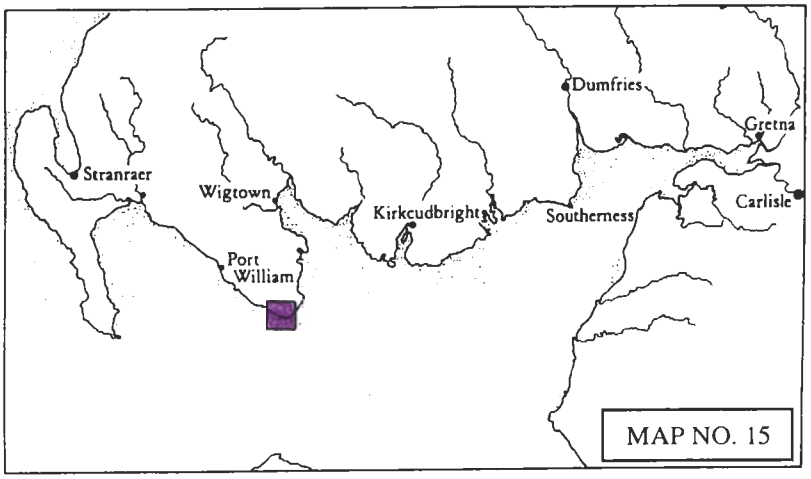




KEY

Erosion class	Derwent Code	Colour
Definitely accreting	Prussian Blue	
Accreting/stable	Light Blue	
Stable	Grass Green	
Stable/eroding	Deep Chrome	
Definitely eroding	Deep Vermilion	
Both accreting and eroding	Imperial Purple	
No access	Blank	
Land below 10m	Straw Yellow	

MAP CLASS: **EROSION**
Assessment date: 27.9.96
Scale 1:25 000



MAP 15: BUILT HERITAGE AND ARCHAEOLOGY

Sites on the Coast Edge & Foreshore

NX43SW 1
NX 4482 3423
CASTLE FEATHER
Promontory Fort / Castle
Scheduled Ancient Monument
1st Mill BC/ 1st/2nd Mill AD
Poor
Survey & Monitor

NX43SE 1
NX 4553 3415
BURROW HEAD
Promontory Fort
Scheduled Ancient Monument
1st Mill BC/AD
Poor
Survey & Monitor

NX43SE 3
NX 4559 3412
BURROW HEAD
Promontory Fort
Scheduled Ancient Monument
1st Mill BC/AD
Poor
Survey & Monitor

NX 4592 3414
BURROW HEAD
WW2 Pillbox
Mid 20th century
Poor
Survey & Monitor

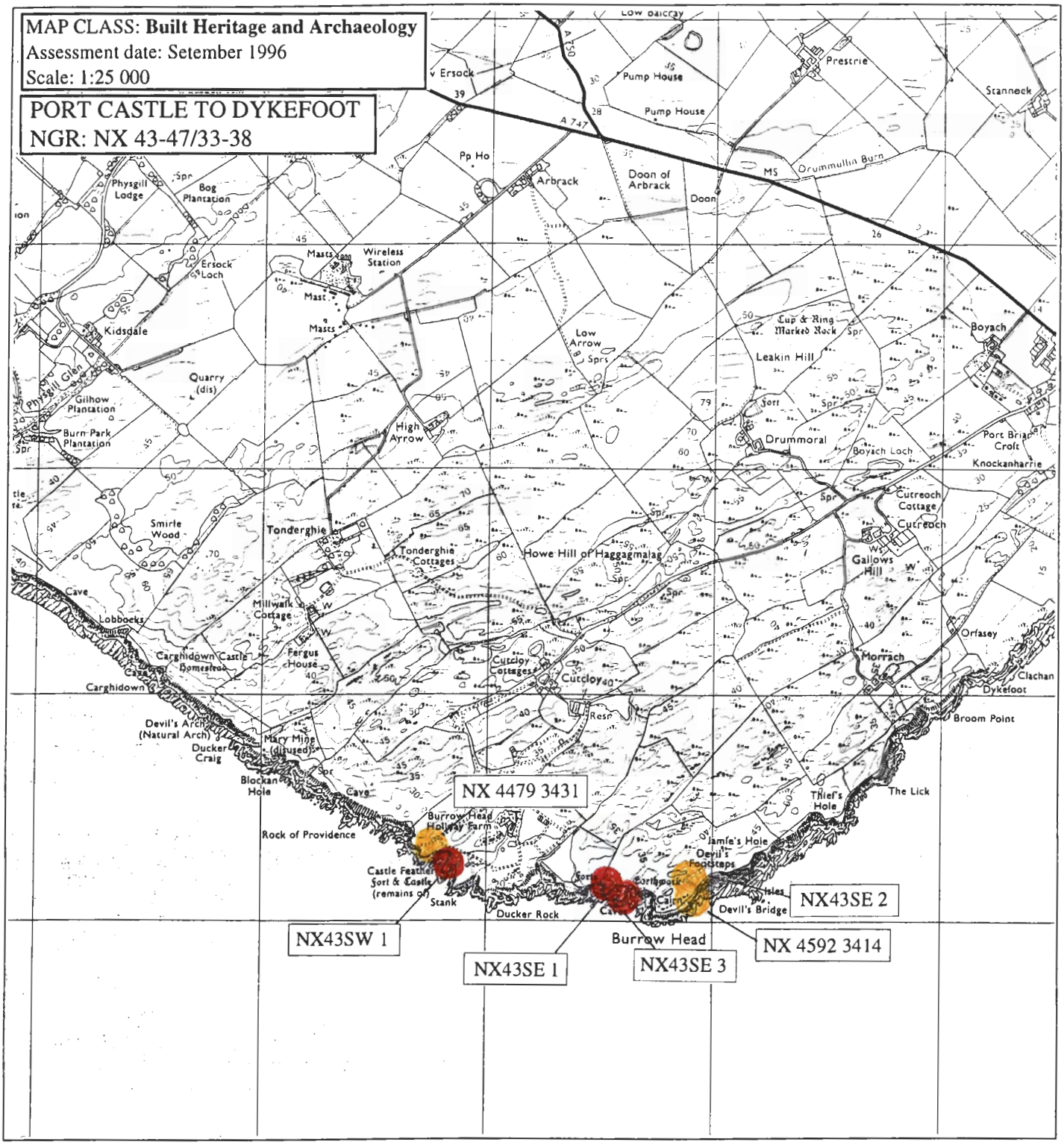
NX43SE 2
NX 4591 3419
BURROW HEAD
Earthwork
Uncertain
Fair
Monitor

Sites in the Hinterland

NX 4479 3431
BURROW HEAD
WW2 Defences
Mid 20th century
Good
Nil

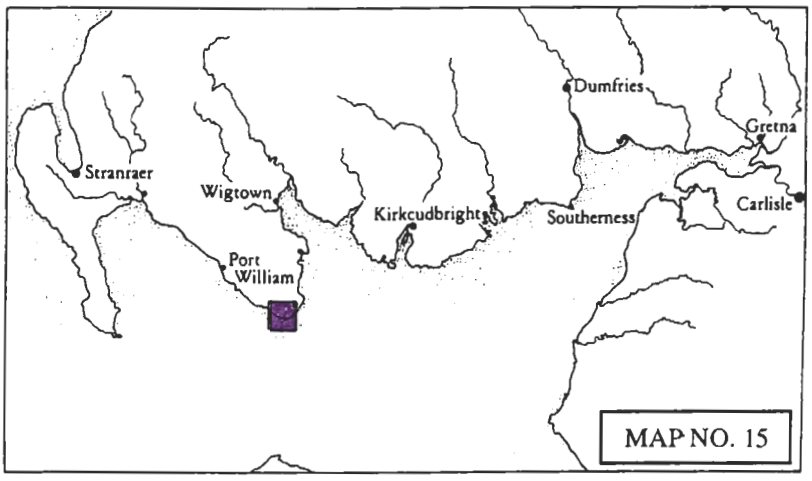
MAP CLASS: **Built Heritage and Archaeology**
Assessment date: Setember 1996
Scale: 1:25 000

PORT CASTLE TO DYKEFOOT
NGR: NX 43-47/33-38



KEY

Site location	Symbol	Colour	Significance
NGR ref. - eg. NX 143 368	Roundel - Solid, (or area)	Red	Protected Ancient Monument
	Cross	Red	Listed Historic Building
	Roundel - Open, (or area)	Red	Monument formally proposed by Historic Scotland for designation
	Roundel - Solid, (or area)	Yellow	Other known Ancient Monument
NMRS ref. - eg. NX13 SW17	Dashed outline	Yellow	Gardens/Designed landscape
	Roundel - Solid, (or area)	Yellow	Undesignated wreck
	Area	Green	Insufficient information; more work needed
	Area	Blue	Probably archaeologically sterile



MAP 16: DYKEFOOT TO HOWE HOLE OF SHADDOCK

Hinterland Geology and Coastal Geomorphology: This region of coastline includes the Isle of Whithorn which is a peninsula situated at the confluence of two geological faults. The hinterland becomes less steep the further one travels north. The hinterland drift geology is exclusively till overlying exposed rock. The cliff-edge is very irregular and incised, especially around Doctors Rock and beyond to Howe Hole of Shadock. The cliff-base is commonly cut by deep gullies and off-shore stacks, indicative of long term erosion, are also common.

Erosion Class: Sand and shingle are accreting in Whithorn harbour. This material is being brought in from the Isle of Whithorn Bay, possibly by accelerated sediment transportation when conditions are adverse. The rest of the coastline in this region appears to be stable but eroding at certain localities mentioned below.

Built Heritage & Archaeology: A cluster of sites at the Isle of Whithorn ranging in date from the first millennium BC/AD through to the eighteenth and nineteenth centuries and a wider distribution of more isolated sites leading north from the village, comprising later prehistoric promontory forts, a nineteenth century mill and a World War 2 platform, are included in this section. The listed buildings and remains of the port of the Isle of Whithorn, the chapel and the Castle all survive in good condition. Only at the promontory forts of Isle Head, Steinhead and Cairnhead is limited and localised coastal erosion evident and surveying and monitoring recommended. In the case of Isle Head fort visitor impact should also be taken into account.

Map 16: Hinterland Geology and Coastal Geomorphology

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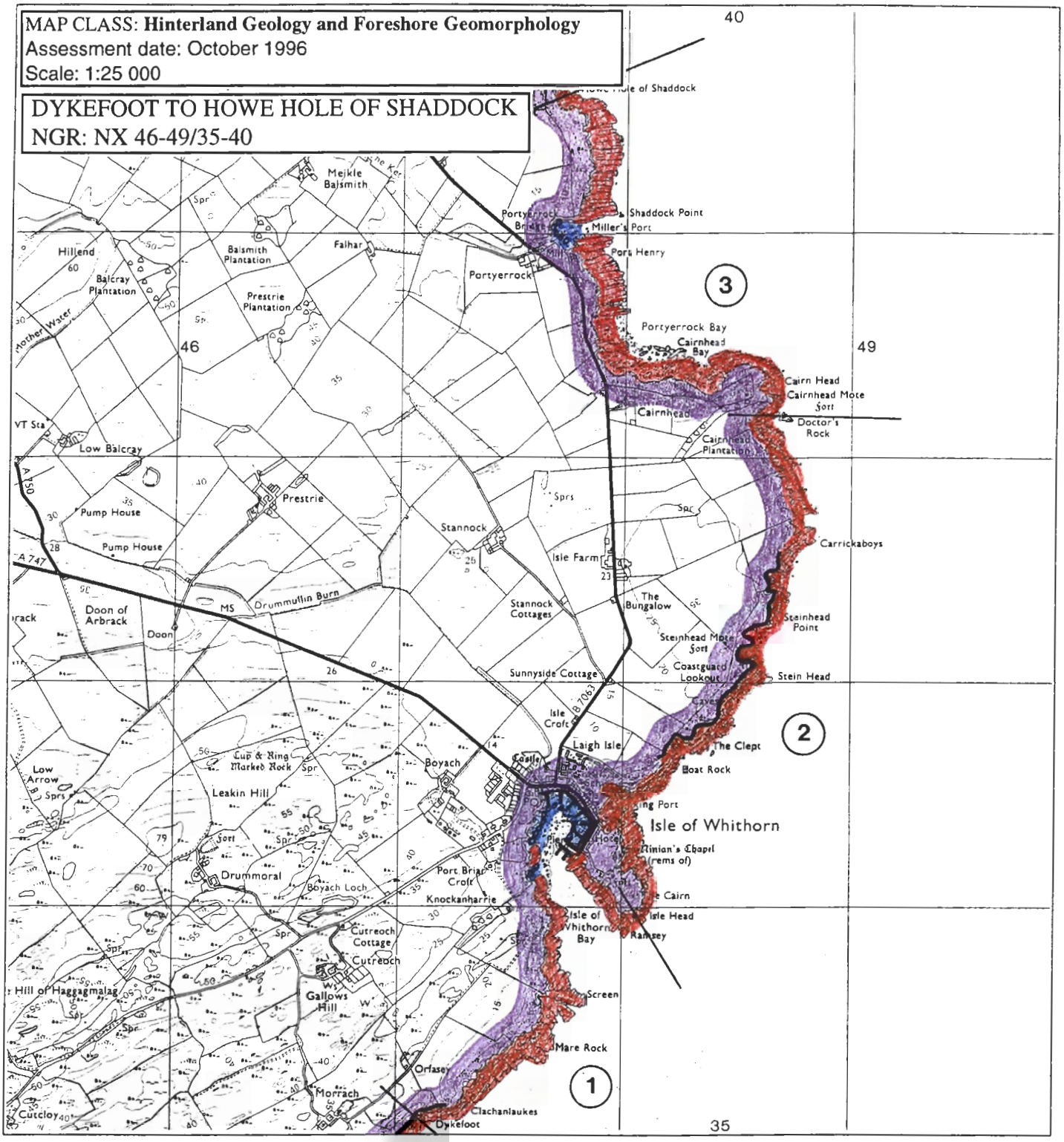
1. DYKE FOOT to ISLE HEAD (WHITHORN PENINSULA)
NX 477 356
2.5km
Cliff (< 10m)
Till over exposed rock
This is an exposed section of coastline that consists of greywackee rock platforms that are incised into numerous gullies. The cliff-edge is very irregular and indented into a series of ledges and sheer platforms. Wave cut platforms are common at the MHWM. The harbour at Whithorn contains mainly boulders and sand.

2. ISLE HEAD to DOCTOR'S ROCK
NX 485 370
2.5km
Cliff (> 10m)
Till over exposed rock
Exposed incised cliff-edge indented by precipitous gullies. Stacks and caves occur in places. The cliffs are overlain with till.

3. DOCTOR'S ROCK to HOWE HOLE of SHADDOCK
NX 480 370
2.5km
Cliff (> 10m)
Till over exposed rock
An exposed promontory headland occurs at Cairn Head (NX 486 384) which consists of steeply shelving greywackee platforms. Portyerrock Cliff (> 10m) and low edge (< 5m)Bay (NX 484384) consists of incised folded outcrops of greywackee. Till meets the irregular cliff edge.

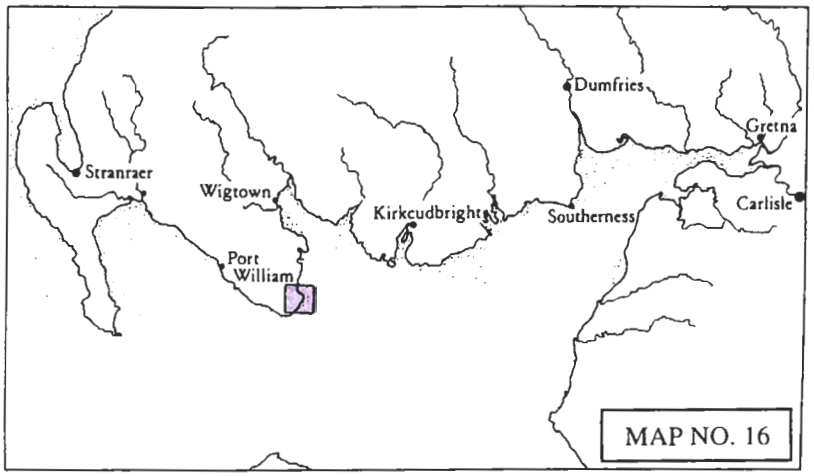
MAP CLASS: **Hinterland Geology and Foreshore Geomorphology**
Assessment date: October 1996
Scale: 1:25 000

DYKEFOOT TO HOWE HOLE OF SHADDOCK
NGR: NX 46-49/35-40

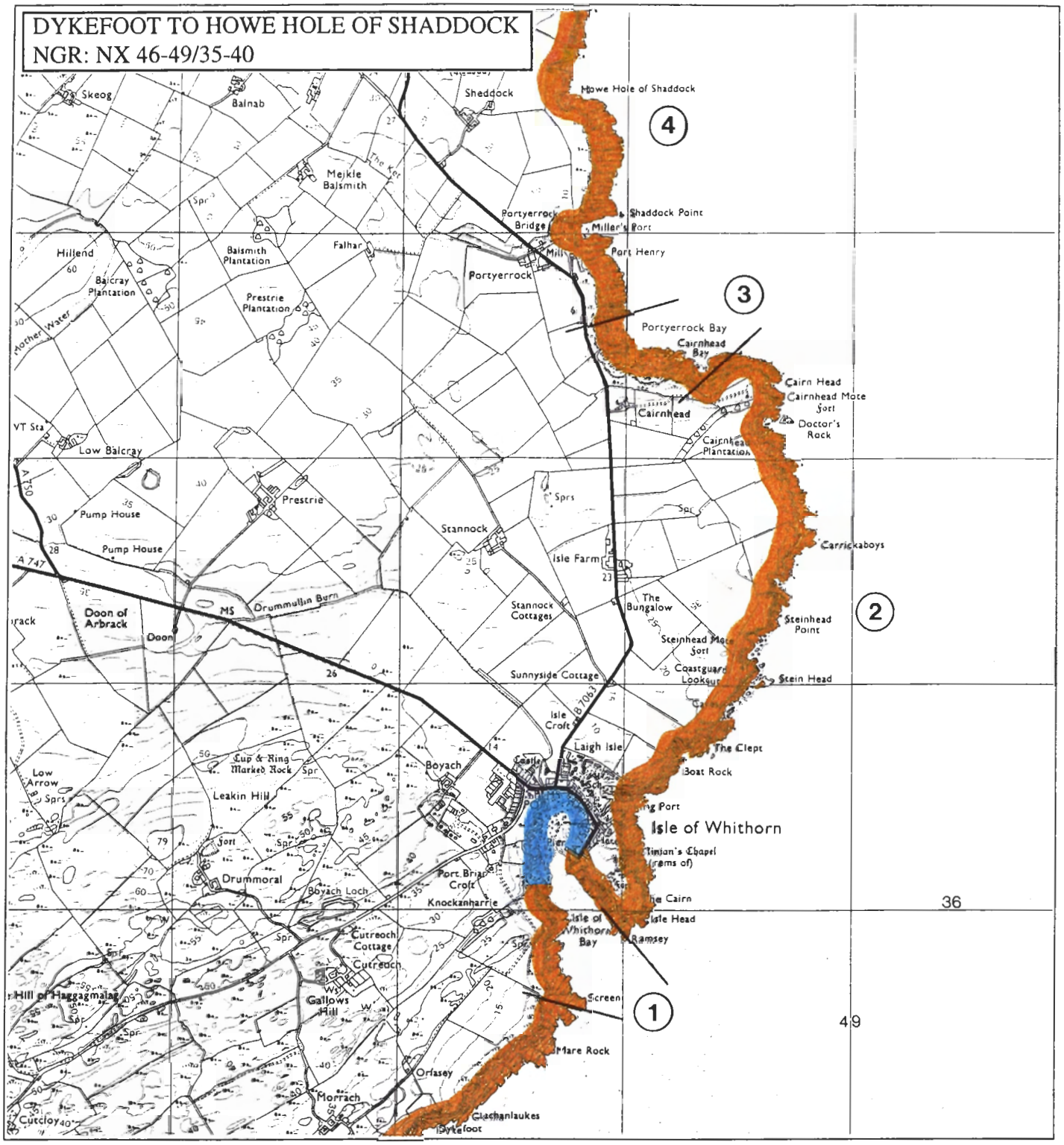


KEY

Hinterland Geology	Derwent Code	Colour
Drift, boulder clay	French Grey	
Drift, boulder clay over visible rock	Dark Violet	
Raised beach and marine deposits	Golden Brown	
Blown sand	Pink Madder Lake	
Glacial sand and gravel	Magenta	
Alluvium	Emerald Green	
Coastal Geomorphology		
Mainly rock platform	Deep vermilion	
Mainly sand	Ultramarine	
Mainly alluvial/marine mud	Venetian Red	
Marsh	May Green	
Coast Edge		
Low edge (<5m)	Thin black line	
Cliff (>5m)	Solid black line	
Man made barrier	Black line with spines	
Shingle beach	Small circles	ooooooo
Human disturbance	Black carats	^^^^^^^



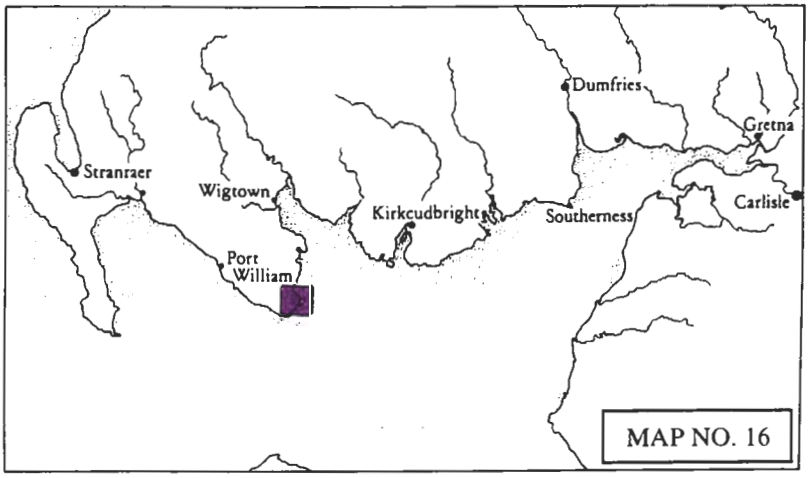
DYKEFOOT TO HOWE HOLE OF SHADDOCK
NGR: NX 46-49/35-40



KEY

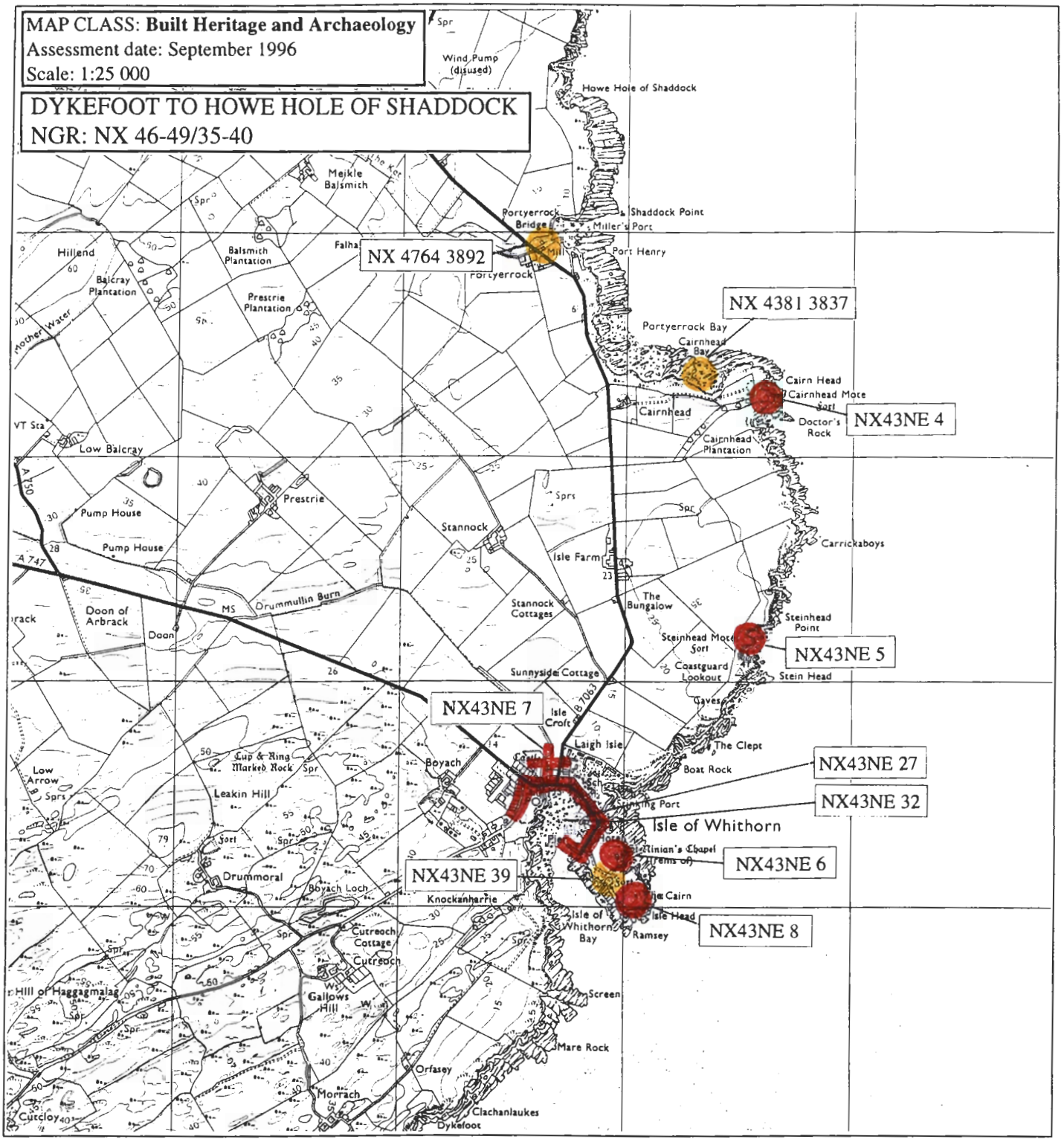
Erosion class	Derwent Code	Colour
Definitely accreting	Prussian Blue	
Accreting/stable	Light Blue	
Stable	Grass Green	
Stable/eroding	Deep Chrome	
Definitely eroding	Deep Vermilion	
Both accreting and eroding	Imperial Purple	
No access	Blank	
Land below 10m	Straw Yellow	

MAP CLASS: **EROSION**
Assessment date: 27.9.96
Scale 1:25 000



MAP CLASS: **Built Heritage and Archaeology**
Assessment date: September 1996
Scale: 1:25 000

DYKEFOOT TO HOWE HOLE OF SHADDOCK
NGR: NX 46-49/35-40



KEY

Site location	Symbol	Colour	Significance
NGR ref. - eg. NX 143 368	Roundel - Solid, (or area)	Red	Protected Ancient Monument
	Cross	Red	Listed Historic Building
	Roundel - Open, (or area)	Red	Monument formally proposed by Historic Scotland for designation
	Roundel - Solid, (or area)	Yellow	Other known Ancient Monument
NMRS ref. - eg. NX13 SW17	Dashed outline	Yellow	Gardens/Designed landscape
	Roundel - Solid, (or area)	Yellow	Undesignated wreck
	Area	Green	Insufficient information; more work needed
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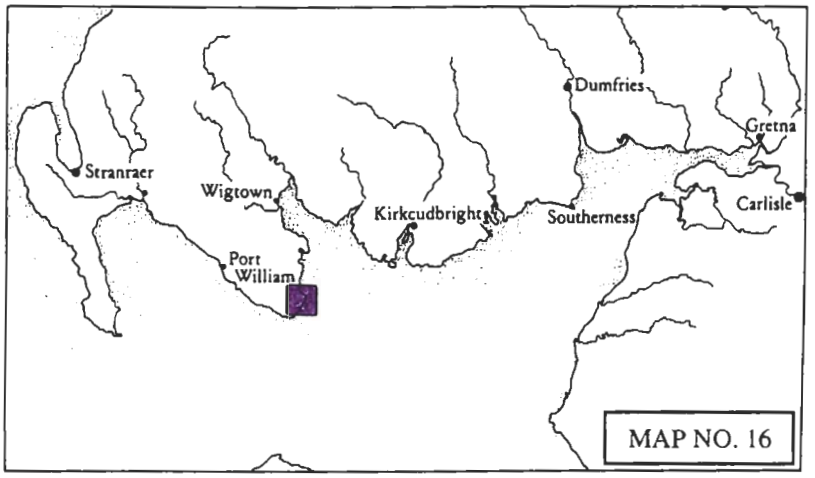


MAP 17: WHITE HILL TO CRUGGLETON BAY

Hinterland Geology and Coastal Geomorphology: This region of the coast has an exposed easterly aspect. The hinterland geomorphology is undulating with till over exposed rock. From White Port to Siddery Point the cliff-edge is precipitous and irregular and overlooks cliffs, caves and inlets. Cruggleton Bay is backed by till with a wide intertidal zone consisting of sand (forming occasional sandy spits), cobbles, boulders and sandy spits.

Erosion Class: Cliff-edge recession is an ongoing process along this stretch of coastline. From Port Allen to Siddery Point the cliff-edge shows clear evidence for slumping and sub-aerial weathering of the cliff face. The presence of caves provides further evidence for erosion. Cruggleton Bay shows evidence of wave attack towards Siddery Point. Scouring, induced by recent storm activity has resulted in sand and shingle build up some distance from the current HWMS. The northern half of the bay appears to more stable judging by the more even sand cover that is less disturbed.

Built Heritage & Archaeology: A wide distribution of isolated sites are included in this section. The sites can be generally divided into two chronological groups; two promontory forts, Dinnans and Old Fort Dinnans, and the castle and settlement of Cruggleton Castle, belonging to the 1st Millennium BC/AD and medieval period (Ewart, 1985) distributed along the coast south of Garlieston; and a second group of more widely distributed World War 2 structures, comprising a pillbox, watchtower and a mulberry. Also included in this section is a sea wall at Garlieston Bay, a landing place at Port Allen and the gardens of Galloway House. Both the two latter sites and the sites of group 1 are affected by coastal erosion to various degrees and surveying and monitoring is recommended. The promontory forts of Dinnans and Old Fort Dinnans are also adversely affected by the impact of cattle, particularly so in the case of the latter. Cruggleton Castle, excavated between 1978 and 1981 (Ewart, 1985) may also be at threat from agricultural impact in addition to the coastal erosion already documented (Ewart, 1985, 4-6).

Map 17: Hinterland Geology and Coastal Geomorphology

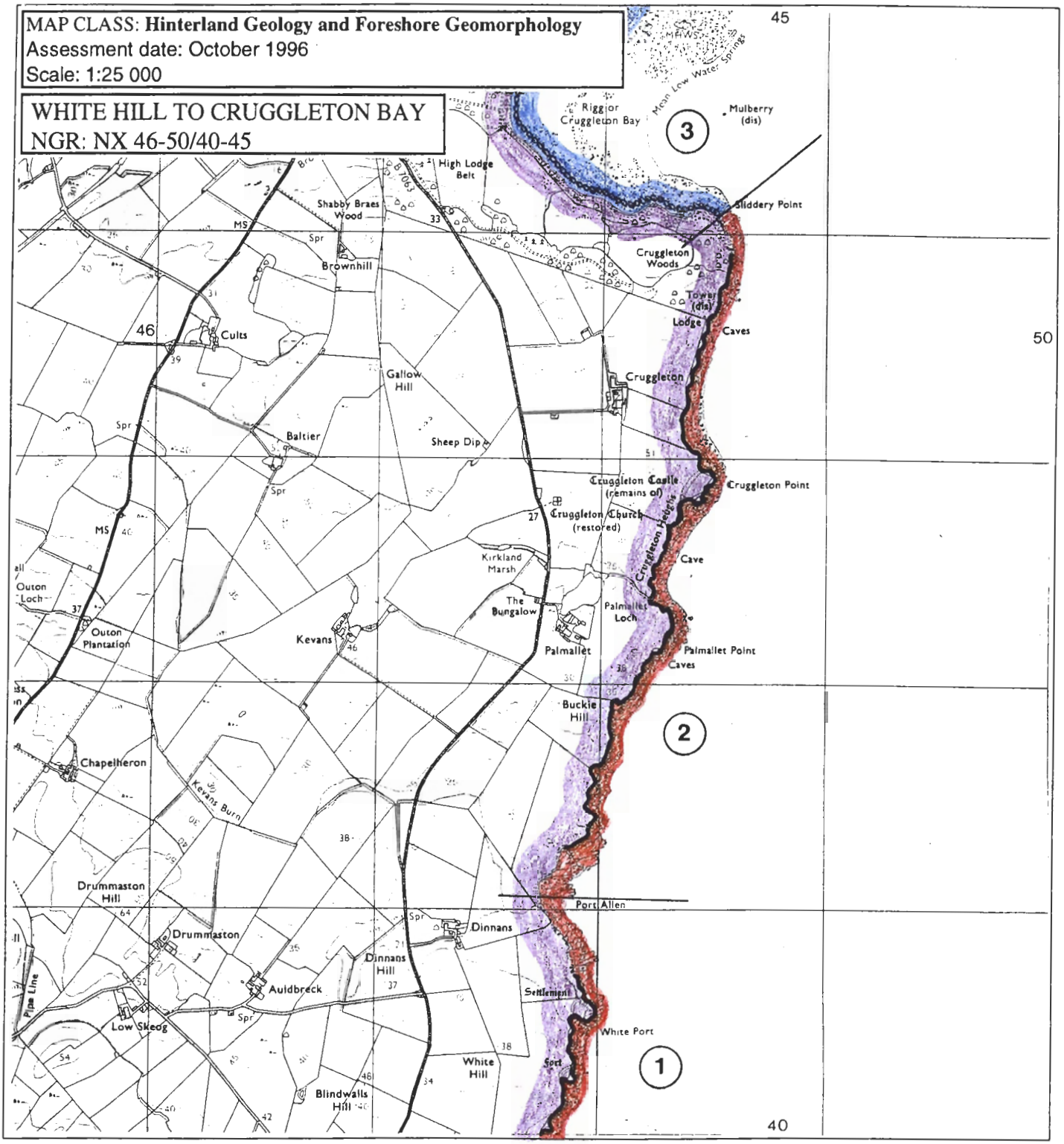
1. HOWE HOLE of SHADDOCK to PORT ALLEN
NX 478 400
1.4km
Cliff (> 10m)
Till over exposed rock
Irregular incised high cliff-edge overlain by till. Greywackee platforms moulded by wave action occur throughout the length of this unit.

2. PORT ALLEN to SIDDERY POINT
NX 418 420
3km
Cliff (> 10m)
Till over exposed rock
This exposed region of the coast is highly indented and sea-caves are present. The foreshore is narrow with rock and boulders exposed at the MLWM.

3. SIDDERY POINT to DUMBIE POINT
NX 482 460
3km
Low edge (< 5m)
Till
This unit includes the sheltered Cruggleton Bay. The hinterland consists of till. The foreshore within the bay is very wide (c.60m to the MLWM) and continues to Garlieston Bay. The foreshore consists of poorly sorted boulders (c.70%) and sand. Shingle is banked against the backshore.

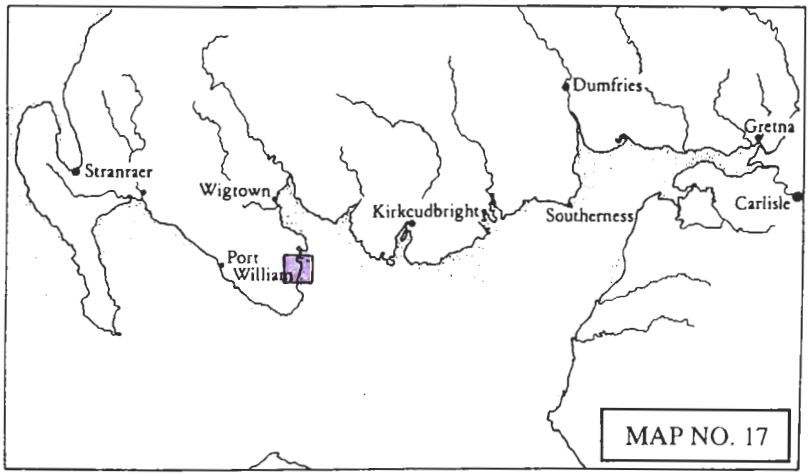
MAP CLASS: **Hinterland Geology and Foreshore Geomorphology**
Assessment date: October 1996
Scale: 1:25 000

WHITE HILL TO CRUGGLETON BAY
NGR: NX 46-50/40-45



KEY

Hinterland Geology	Derwent Code	Colour
Drift, boulder clay	French Grey	
Drift, boulder clay over visible rock	Dark Violet	
Raised beach and marine deposits	Golden Brown	
Blown sand	Pink Madder Lake	
Glacial sand and gravel	Magenta	
Alluvium	Emerald Green	
Coastal Geomorphology		
Mainly rock platform	Deep vermilion	
Mainly sand	Ultramarine	
Mainly alluvial/marine mud	Venetian Red	
Marsh	May Green	
Coast Edge		
Low edge (<5m)	Thin black line	
Cliff (>5m)	Solid black line	
Man made barrier	Black line with spines	
Shingle beach	Small circles	oooooo
Human disturbance	Black carats	^^^^^^

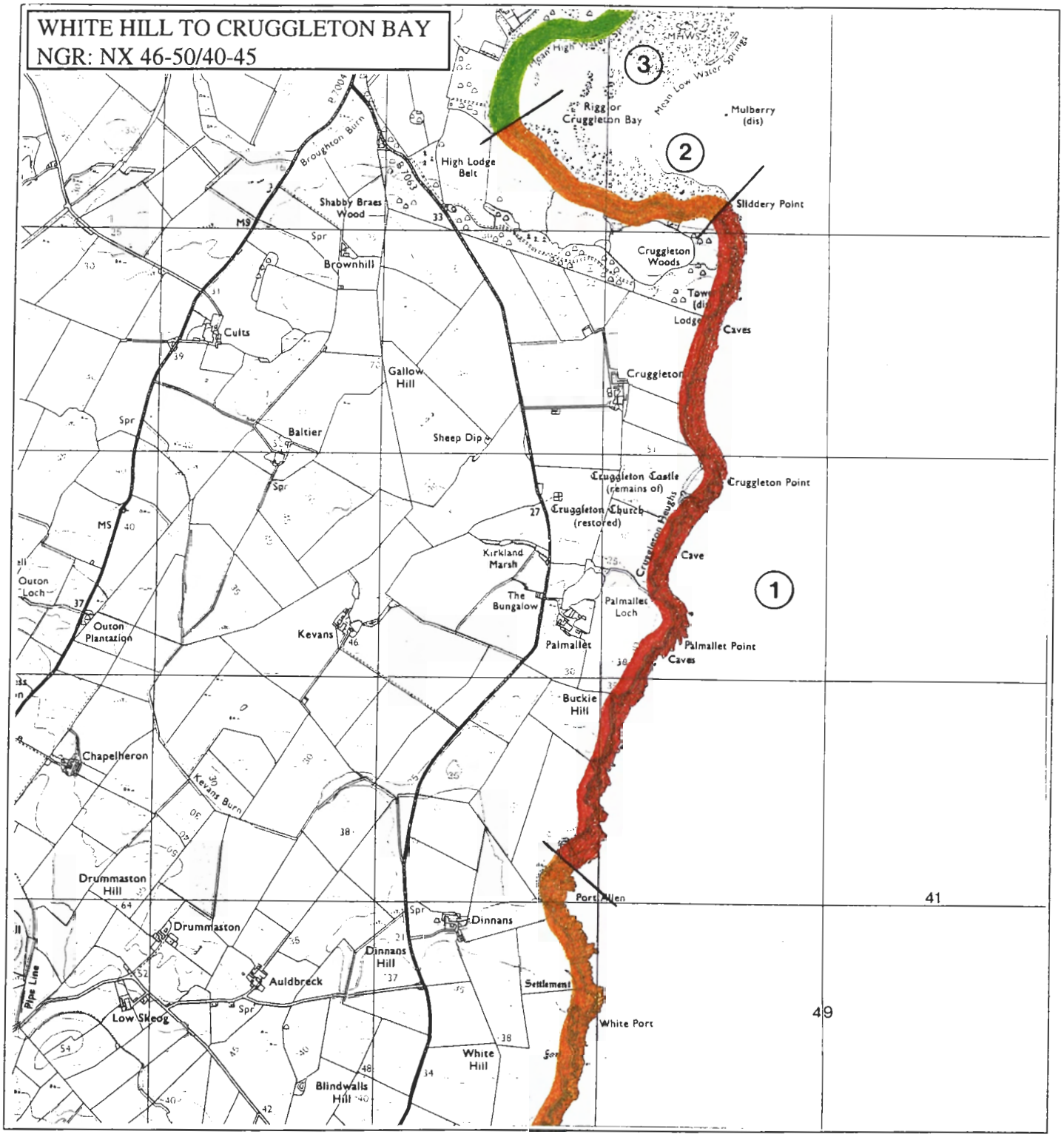


MAP 17: EROSION

1. PORT ALLEN to SIDDERY POINT
NX 485430
Definitely eroding
This region of coast has an exposed easterly aspect and an irregular cliff-edge. The middle section of this unit includes Cruggleton Heughs (NX 483426) which is an indented cliff line of steep cliffs with sea caves. Small embayments occur at Cruggleton Point (NX485429). The precipitous nature of the cliffs with slope-over-wall characteristics suggest that this region is definitely eroding, the speed of which is difficult to monitor, but it is considered to be slow.

2. SIDDERY POINT to east of HIGH LODGE POINT
NX 480 441
0.9km
Eroding or stable
Southern end of Rigg of Garlieston Bay. The intertidal area is strewn with poorly sorted cobbles and boulders. The exposed rocky outcrops are being scoured by shingle which suggests that erosion is ongoing.

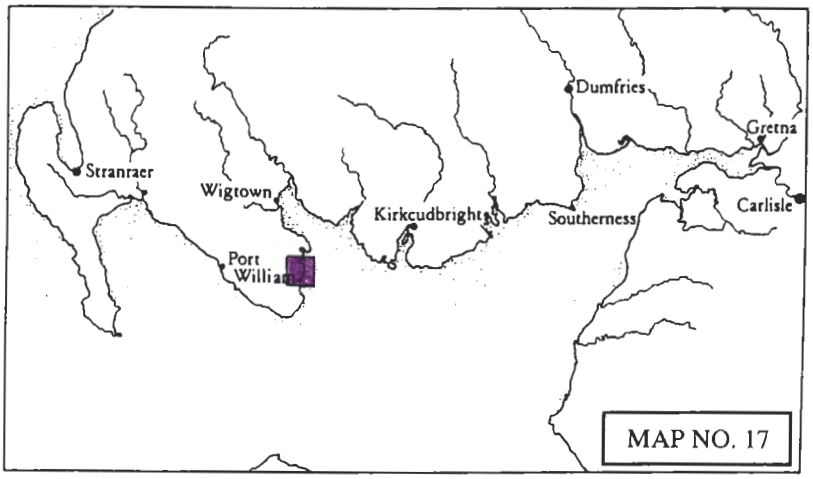
3. HIGH LODGE BELT to south of GARLIESTON SCHOOL
NX 476 447
0.9
Stable
This unit is at the present stable owing to the shelter afforded by the bay. Shingle and sand cover the foreshore and the backshore is protected by a sea wall.



KEY

Erosion class	Derwent Code	Colour
Definitely accreting	Prussian Blue	
Accreting/stable	Light Blue	
Stable	Grass Green	
Stable/eroding	Deep Chrome	
Definitely eroding	Deep Vermilion	
Both accreting and eroding	Imperial Purple	
No access	Blank	
Land below 10m	Straw Yellow	

MAP CLASS: **EROSION**
Assessment date: 30.9.96
Scale 1:25 000



MAP 17: BUILT HERITAGE AND ARCHAEOLOGY

Sites on the Coast Edge & Foreshore

NX44SE 3
NX 4786 4026
OLD FORT, DINNANS
Promontory Fort
Scheduled Ancient Monument
1st Mill BC/AD
Poor
Survey & Monitor

NX 4790 4024
DINNANS
WW2 Pillbox
Mid 20th century
Good
Nil

NX44SE 2
NX 4792 4057
DINNANS
Promontory Fort
Scheduled Ancient Monument
1st Mill BC/AD
Fair
Survey & Monitor

NX44SE 18
NX 477 410
PORT ALLEN
Landing Place
Uncertain
Poor
Monitor

NX44SE 4
NX 4842 4281
CRUGGLETON CASTLE
Castle/Motte/Settlement
Scheduled Ancient Monument
1st century AD - 17th century
Fair
Monitor

NX 48 43
GALLOWAY HOUSE
Gardens
19/20th century
Poor
Monitor

NX 4760 4461
CRUGGLETON
BAY
Mulberry
Mid 20th century
Good
Nil

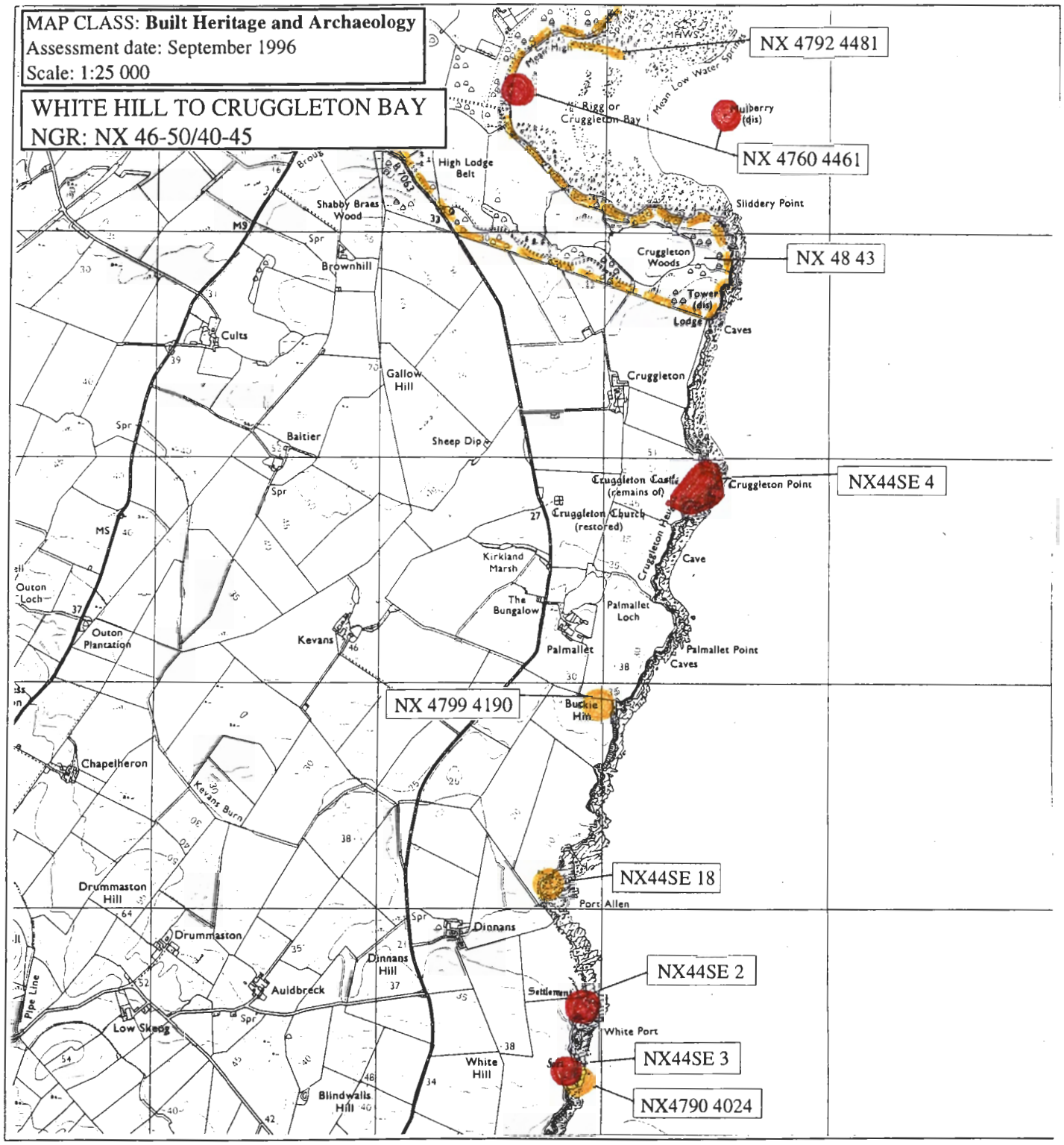
NX 4792 4481
CRUGGLETON
BAY
Curvilinear Wall
20th century
Good
Nil

Sites in the Hinterland

NX 4799 4190
BUCKLE HILL, PALMALLET
WW2 Coastal Watchtower
Mid 20th century
Good
Nil

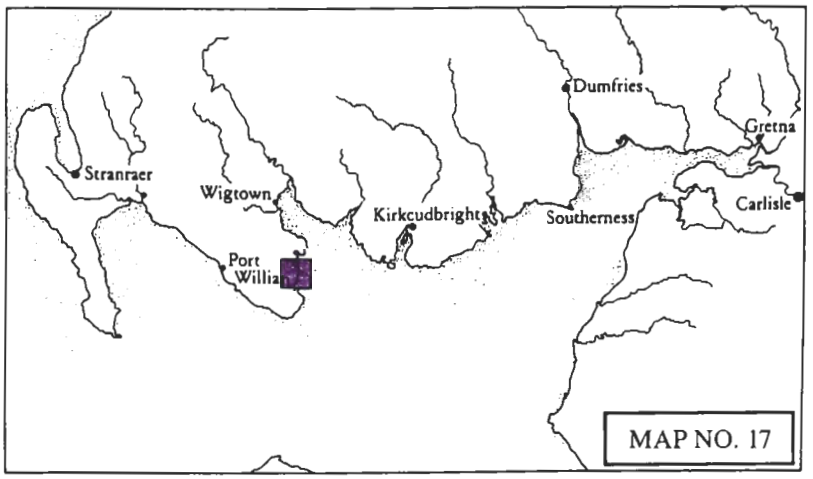
MAP CLASS: **Built Heritage and Archaeology**
Assessment date: September 1996
Scale: 1:25 000

WHITE HILL TO CRUGGLETON BAY
NGR: NX 46-50/40-45



KEY

Site location	Symbol	Colour	Significance
NGR ref. - eg. NX 143 368	Roundel - Solid, (or area)	Red	Protected Ancient Monument
	Cross	Red	Listed Historic Building
	Roundel - Open, (or area)	Red	Monument formally proposed by Historic Scotland for designation
	Roundel - Solid, (or area)	Yellow	Other known Ancient Monument
NMRS ref. - eg. NX13 SW17	Dashed outline	Yellow	Gardens/Designed landscape
	Roundel - Solid, (or area)	Yellow	Undesignated wreck
	Area	Green	Insufficient information; more work needed
	Area	Blue	Probably archaeologically sterile



MAP 18: GARLIESTON HOUSE TO INNERWELL PLANTATION

Hinterland Geology and Coastal Geomorphology: This section of the coastline includes Siddery Point to Dumbie Point. Here, till covers a low coastal edge and backs a wide shingle beach. Garlieston Bay appears fairly sheltered but has been protected by sea defences. Marine sands and gravels outcrop at the head of the bay intermixed with regions of till and morainic fluvioglacial drift. Towards Egerness Point the coastal edge becomes irregular. Northwards from this point the exposed cliff-edge becomes steeper until Inerwell Plantation where the cliffs shelve less steeply. At Innerwell, the cliffs give way to sand flats.

Erosion Class: Erosion is occurring on the Ringan (Unit 1) foreshore evident by scouring. At Dumbie Point a breakwater has collapsed and is leading to severe erosion of the shoreline immediately to the north.. Here an ashlar built sea wall has collapsed and its fabric is spread over a wide area. The exposed soft marine sands and clays are being eroded out at a fast rate and undermining a public foot path. The problem is further compounded by the presence of a tree plantation along the shoreline. This soil behind the sea wall has been loosened further by the tree root activity. The stretch of coastline effected is about 30m in length. Loss of land behind the ashlar sea wall was seen to be about 3m in places. Garlieston Bay is stable with a low sandy beach. From Eggerness as far as Innerwell Plantation the coast is fairly resilient but thought to be eroding.

Built Heritage & Archaeology: This section includes a cluster of sites around Garlieston Bay comprising a mulberry, jetties, breakwaters and the listed buildings of the village of Garlieston. The village includes warehouses, harbour buildings, mills, houses and a harbour of the eighteenth and nineteenth centuries (Graham, 1979, 46-48). All but the mulberry survive in good condition; it is threatened by sea abrasion and therefore requires monitoring. North of Garlieston Bay is the promontory fort of Eggerness Castle which is suffering from limited coastal erosion. The lack of any existing plan of this site in the NMRS and the negative impact of the forestry plantation covering the site prompts the recommendation that a survey and monitoring exercise be carried out. Further north, at Innerwell Point, lies an upstanding stone which may or may not be a natural feature. This is the only site in this section located in the hinterland and is not threatened by coastal erosion.

18: Hinterland Geology and Coastal Geomorphology

1. SIDDERY POINT to DUMBIE POINT
NX 482 460
3km
Low edge (< 5m)
Till
This unit includes the sheltered Cruggleton Bay. The hinterland consists of till. The foreshore within the bay is very wide (c.60m to the MLWM) and continues to Garlieston Bay. The foreshore consists of poorly sorted boulders (c.70%) and sand. Shingle is banked against the backshore.

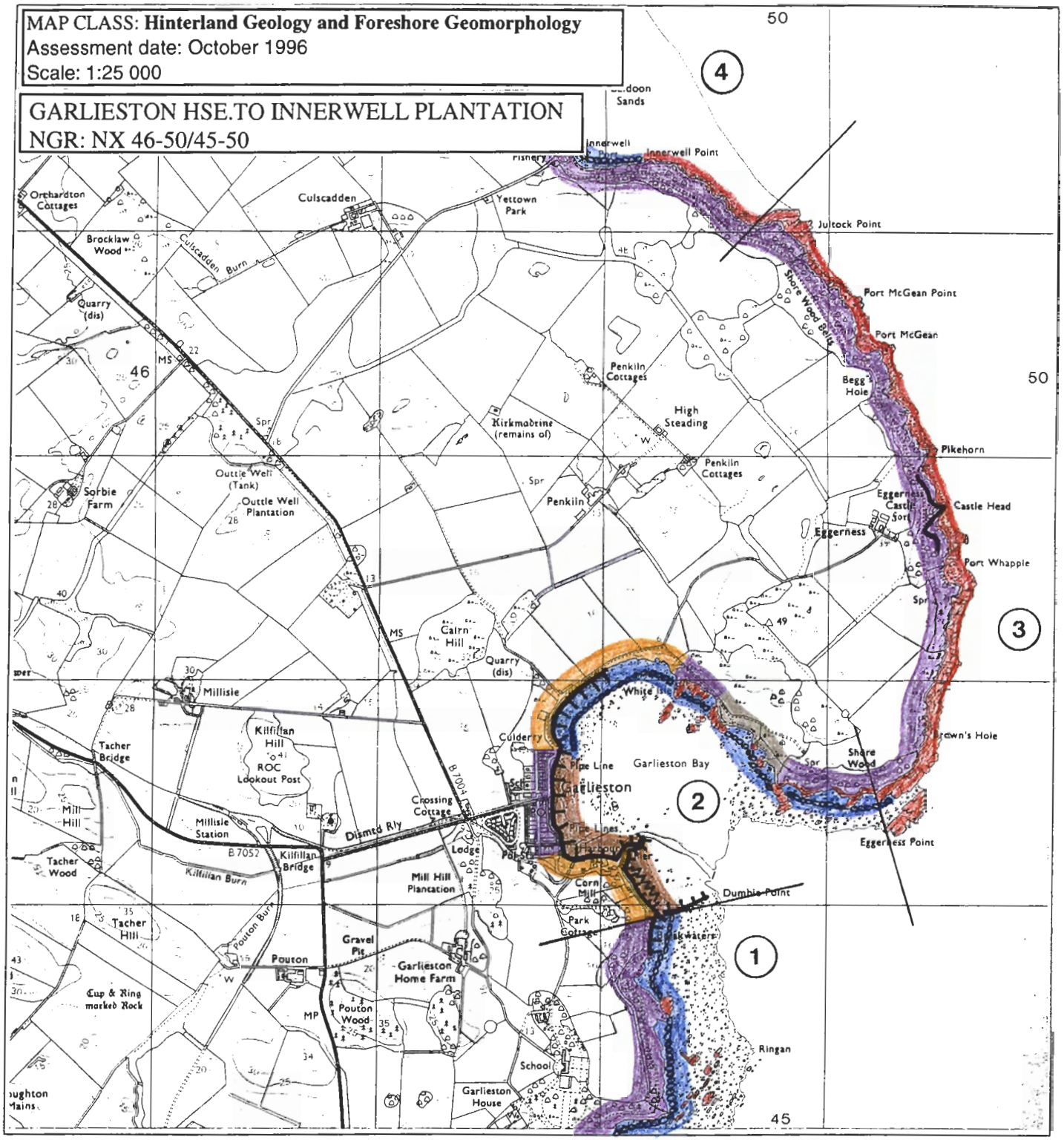
2. DUMBIE POINT to EGGERNESS POINT
NX 480 466
2.8km
Low edge (< 5m)
Marine sands and brecciated mud stones with till and drift deposits towards Eggerness Point
Garlieston Bay is sheltered with a hinterland consisting of marine cover sands interspersed with tills and brecciated mud stones. Towards Eggernes point outcrops of greywackee are overlain by drift and till.

3. EGGERNES POINT TO JUTOCK POINT
NX 494 480
3km
Cliff (> 10)
Till over exposed rock
This region of exposed coastline has a highly irregular indented cliff-edge that is overlain by till. The shoreline is steep and is exposed rock platform.

4. JUTROCK POINT to INNERWELL PLANTATION
NX 480 493
1.6km
Low cliff (< 5m)
Till over exposed rock
Exposed rock platforms overlain by till. The rocky shore gives way to a sand flats.

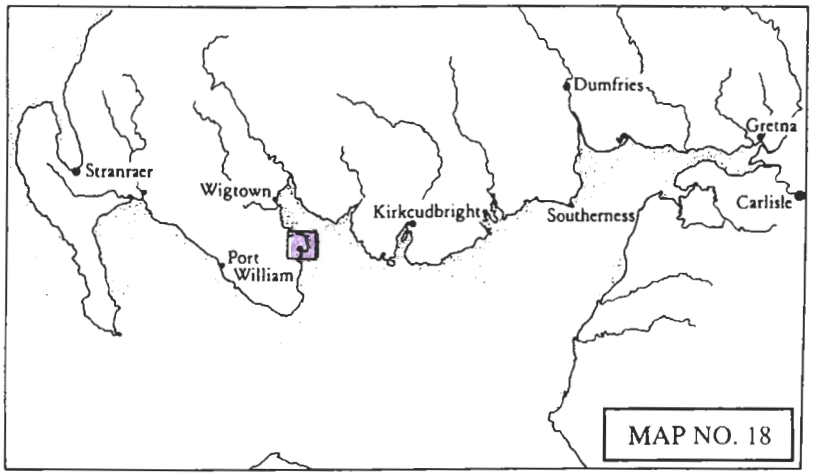
MAP CLASS: **Hinterland Geology and Foreshore Geomorphology**
Assessment date: October 1996
Scale: 1:25 000

GARLIESTON HSE.TO INNERWELL PLANTATION
NGR: NX 46-50/45-50



KEY

Hinterland Geology	Derwent Code	Colour
Drift, boulder clay	French Grey	
Drift, boulder clay over visible rock	Dark Violet	
Raised beach and marine deposits	Golden Brown	
Blown sand	Pink Madder Lake	
Glacial sand and gravel	Magenta	
Alluvium	Emerald Green	
Coastal Geomorphology		
Mainly rock platform	Deep vermilion	
Mainly sand	Ultramarine	
Mainly alluvial/marine mud	Venetian Red	
Marsh	May Green	
Coast Edge		
Low edge (<5m)	Thin black line	
Cliff (>5m)	Solid black line	
Man made barrier	Black line with spines	
Shingle beach	Small circles	
Human disturbance	Black carats	



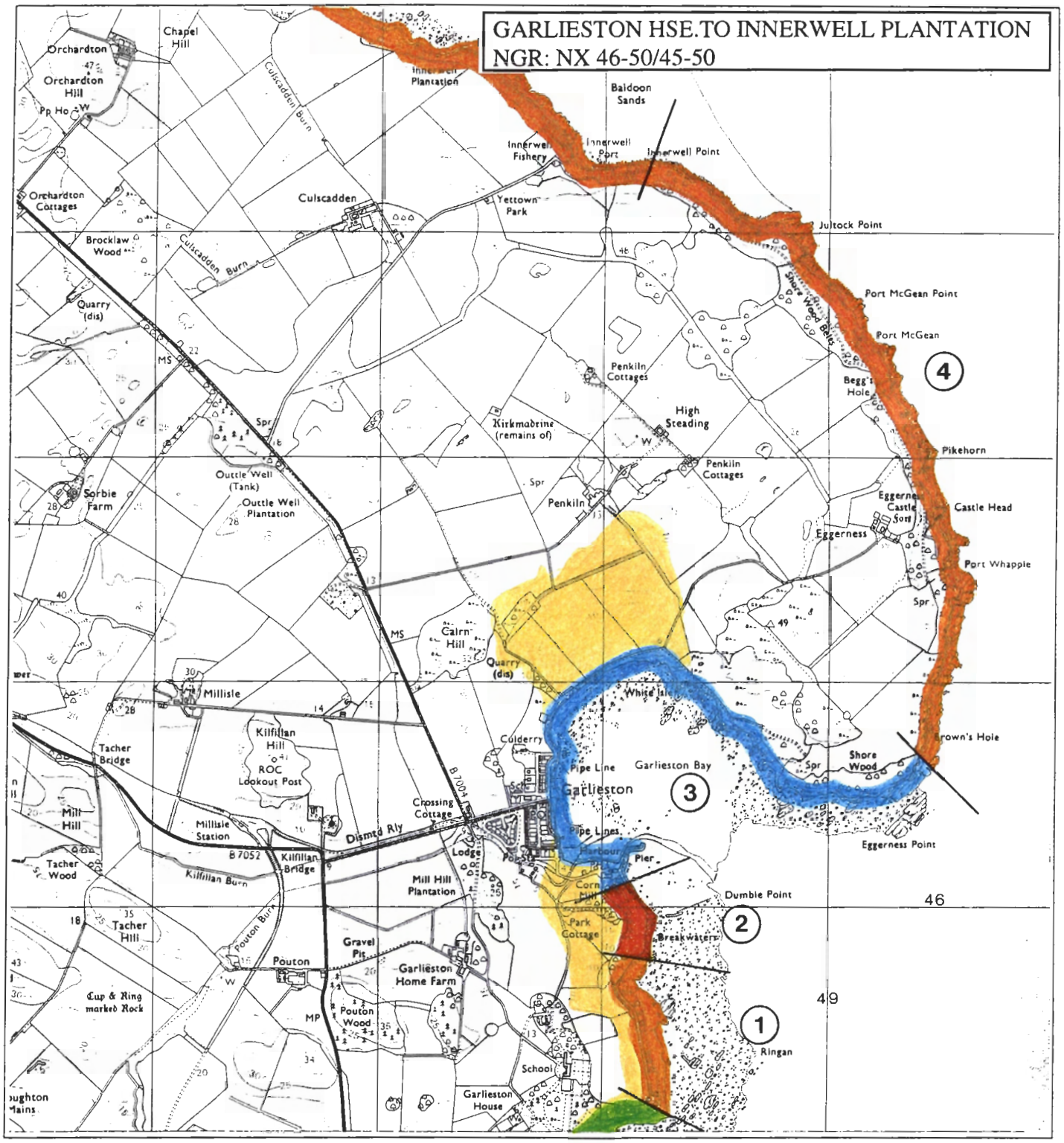
MAP 18: EROSION

1. South of GARLIESTON SCHOOL to west of PARK COTTAGE
NX 482 454
0.6km
Stable or eroding
This unit has a wide tidal area consisting of outcropping rock and boulders. Shingle is banking up at the current HWM. The backshore is vegetated with salt marsh communities and low statured woodland which add increased stability to the shore.

2. West of PARK COTTAGE to south of GARLIESTON PIER
NX 482 459
0.3km
Definitely eroding
This stretch of coastline is severely eroding. The foreshore consists of boulders and shingle banks. A stone breakwater to the south is now derelict with the result that it is not protecting the HWM from south easterly storms. Drystone armouring used to protect a footpath has been severely eroded and its fabric is being washed away by wave attack. The shore edge consists of fluvioglacial clays and these are being scoured and washed away. Tree roots from mature woodland are exposed and general looseness of the soil allows the potential for greater instability. Shore-edge retreat was found to be in excess of 3m.

3. GARLIESTON BAY to EGGERNESS POINT
NX 487 468
2.6km
Stable or accreting
The bay has a wide intertidal area that consists of sand bars with an admixture of cobbles and shingle. The bay is protected by a concrete sea wall. Shingle is being banked at the current HWM. Towards Eggerness Point, shingle and grassy banks form the HWM of this stretch of coast that appears to be sheltered from the extremities of north-easterly gales.

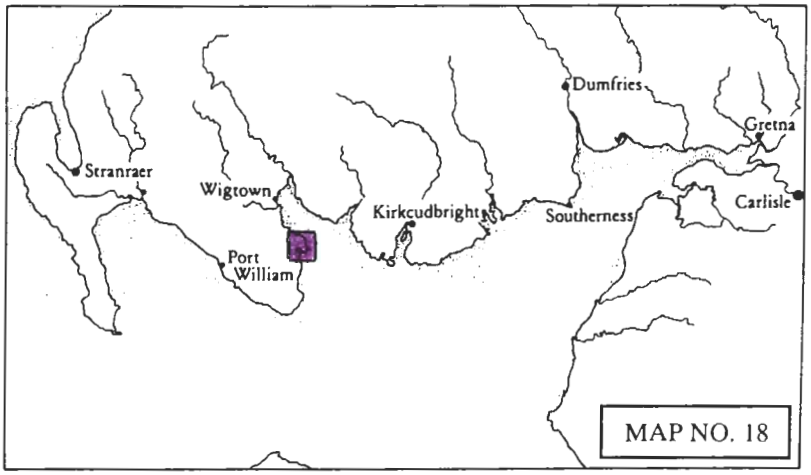
4. EGGERNESS POINT to INNERWELL POINT
NX 494 480
4km
Eroding or stable
This unit consists of an incised irregular cliff-edge. Deep gullies have been formed by the removal of softer mudstones that bed between greywackees. Cliff -edge retreat is hard to predict but it is considered to be slow owing to the fairly resilient nature of the geology. The cliff edge becomes more incised towards Jutrock Point (NX 488491) where tabular rock platforms and stacks occur. These conditions suggest that the coastal edge is slowly eroding.



KEY

Erosion class	Derwent Code	Colour
Definitely accreting	Prussian Blue	
Accreting/stable	Light Blue	
Stable	Grass Green	
Stable/eroding	Deep Chrome	
Definitely eroding	Deep Vermilion	
Both accreting and eroding	Imperial Purple	
No access	Blank	
Land below 10m	Straw Yellow	

MAP CLASS: **EROSION**
Assessment date: 30.9.96
Scale 1:25 000



MAP 18: BUILT HERITAGE AND ARCHAEOLOGY

Sites on the Coast Edge & Foreshore

NX 4822 4578
GARLIESTON BAY
Jettys/Breakwaters
19/20th century
Good
Nil

NX44NE 41
NX 477 464
GARLIESTON
Village
18/19th century
Fair
Nil

NX 4866 4644
GARLIESTON BAY
Mulberry
Mid 20th century
Poor
Survey & Monitor

NX44NE 5
NX 4947 4776
EGGERNESS CASTLE
Promontory Fort / Castle?
1st Mill BC/AD
Poor
Survey & Monitor

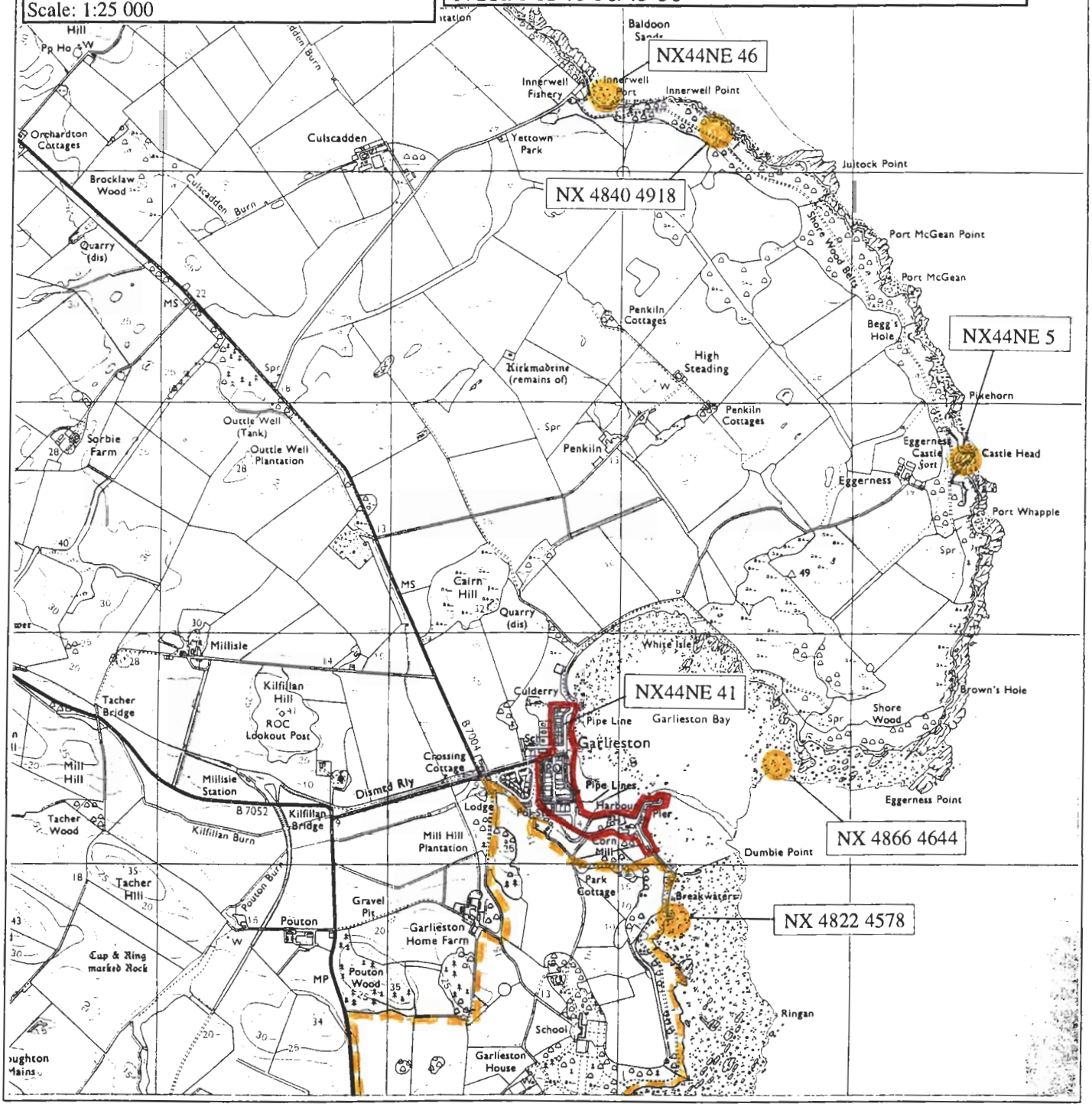
NX44NE 46
NX 4790 4932
INNERWELL PORT
Landing Place
Uncertain
Good
Nil

Sites in the Hinterland

NX 4840 4918
INNERWELL POINT
Upstanding Stone
Uncertain
Good
Nil

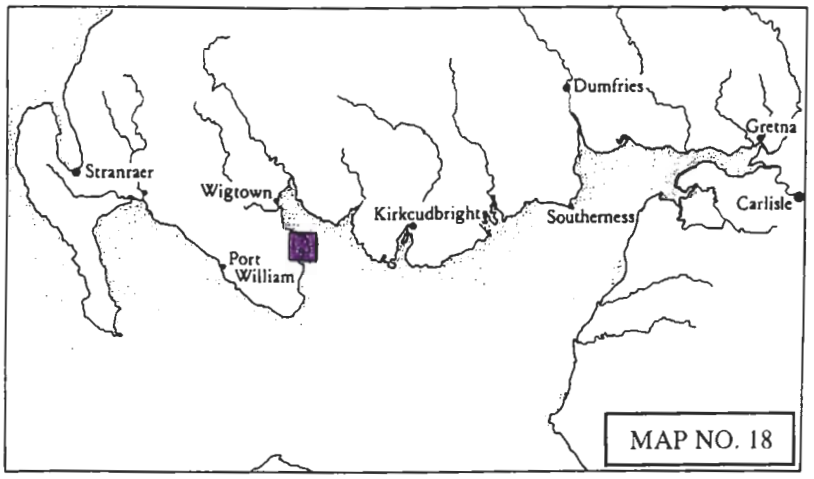
MAP CLASS: **Built Heritage and Archaeology**
Assessment date: September 1996
Scale: 1:25 000

GARLIESTON HSE.TO INNERWELL PLANTATION
NGR: NX 46-50/45-50



KEY

Site location	Symbol	Colour	Significance
NGR ref. - eg. NX 143 368	Roundel - Solid, (or area)	Red	Protected Ancient Monument
	Cross	Red	Listed Historic Building
	Roundel - Open, (or area)	Red	Monument formally proposed by Historic Scotland for designation
	Roundel - Solid, (or area)	Yellow	Other known Ancient Monument
NMRS ref. - eg. NX13 SW17	Dashed outline	Yellow	Gardens/Designed landscape
	Roundel - Solid, (or area)	Yellow	Undesignated wreck
	Area	Green	Insufficient information; more work needed
	Area	Blue	Probably archaeologically sterile



MAP 19: SOUTH OF BALFERN TO CROOK OF BALDOON

Hinterland Geology and Coastal Geomorphology: This region forms the lower estuary of Wigtown Bay. The coastline to the south of South Balfern consists of till drift deposits backing wide tidal flats. From this location the coastal edge change markedly to estuarine conditions. North to the Crook of Baldoon, salt-marsh incised with drainage channels overlook the featureless tidal mud flats. Breakwaters have been employed to trap sediment along the coast. North of Crook of Baldoon salt-marsh continues to a breakwater at the mouth of the River Bladnoch.

Erosion Class: The salt-marsh edge appears to be accreting and stable. Alluvial mud is accreting in front of the salt-marsh. The likely origin of these deposits is in all probability due to high levels of suspended sediment brought down the River Cree trapped in the estuary by the incoming tides.

Built Heritage & Archaeology: A scattered distribution of nineteenth and twentieth century sites are included in this section. They comprise fishing net stakes and causeway foundations on the coastal edge and a disused farmhouse and World War 2 defence structure, possibly a bombing decoy control post relating to Baldoon Airfield (Lowry, 1995, 63-65), situated in the hinterland. All sites survive in good condition and no action is required.

Map 19: Hinterland Geology and Coastal Geomorphology

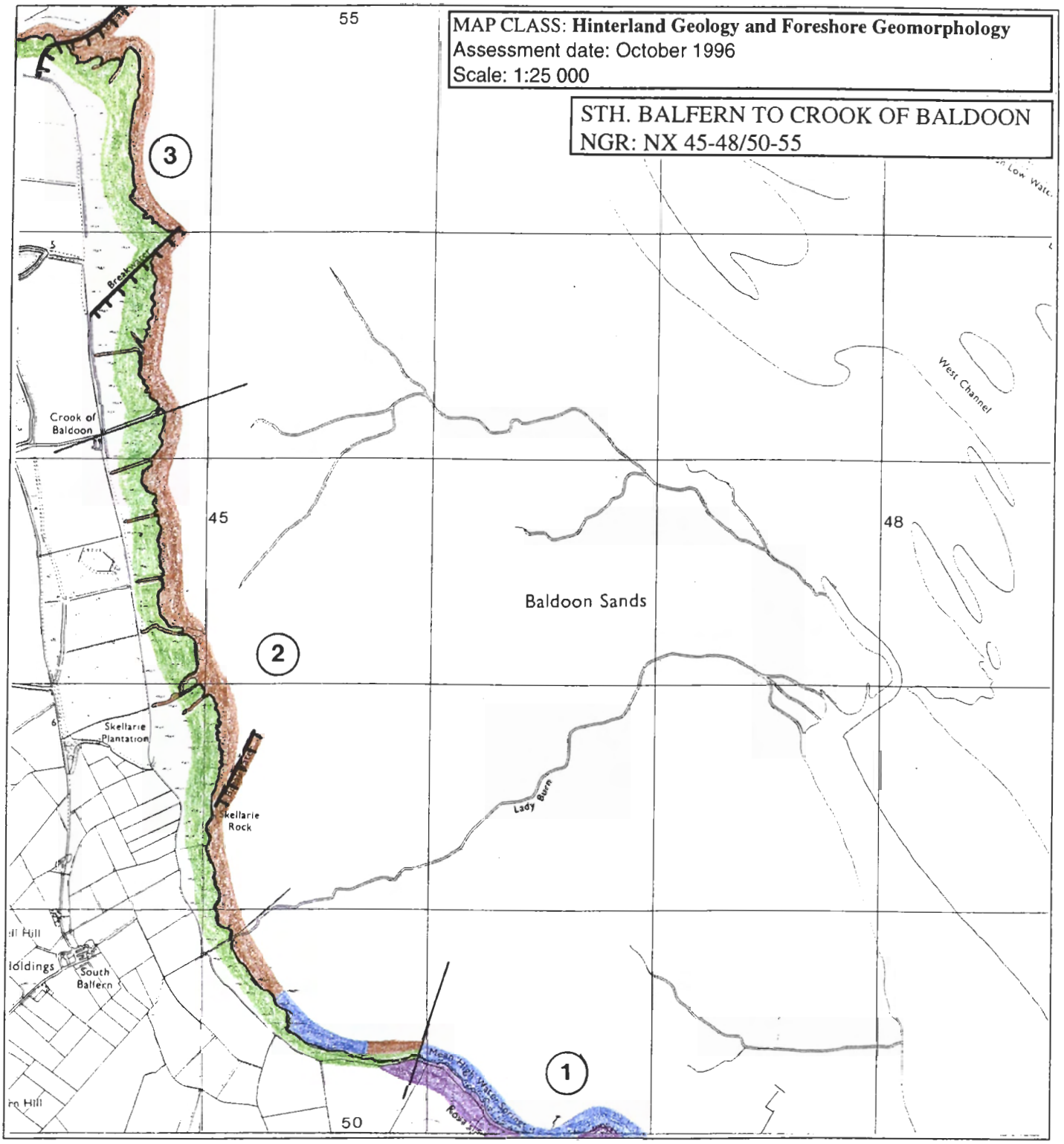
1. JUTROCK POINT to INNERWELL PLANTATION
NX 480 493
1.6km
Low cliff (< 5m)
Till over exposed rock
Exposed rock platforms overlain by till. The rocky shore gives way to a sand flats.

2. INERWELL PLANTATION to CROOCK OF BALDOON
NX 447 540
4.5km
Low edge (< 5m)
Saltmarsh and sand and mud flats
Marine or lower estuary of Wigtown Bay. dominated by salt-marsh on the hinterland. The foreshore is sandy intermixed with mud in parts.

3. CROOK OF BALDOON to CRAIGHILL
NX 447 540
4km
Low edge (<5m)
Salt marsh and estuarine mud
Saltmarsh incised with drainage channels protected by breakwaters towards the south. The meandering River Bladnoch is incised with small creeks with well developed saltmarsh.

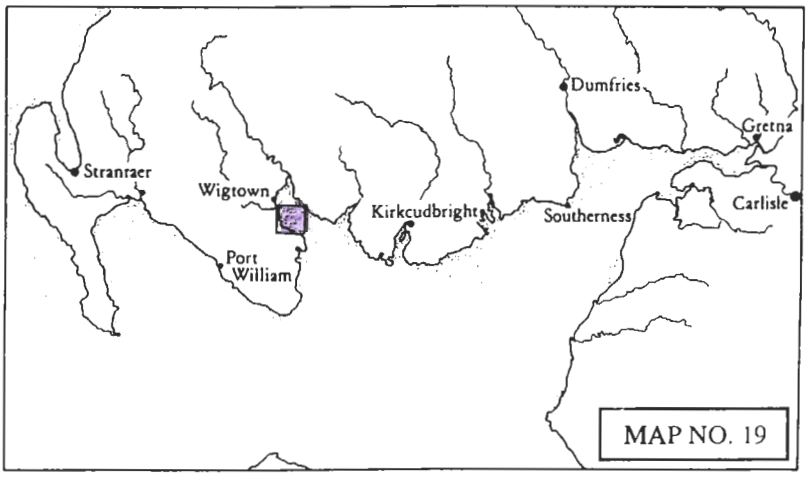
MAP CLASS: **Hinterland Geology and Foreshore Geomorphology**
Assessment date: October 1996
Scale: 1:25 000

STH. BALFERN TO CROOK OF BALDOON
NGR: NX 45-48/50-55



KEY

Hinterland Geology	Derwent Code	Colour
Drift, boulder clay	French Grey	
Drift, boulder clay over visible rock	Dark Violet	
Raised beach and marine deposits	Golden Brown	
Blown sand	Pink Madder Lake	
Glacial sand and gravel	Magenta	
Alluvium	Emerald Green	
Coastal Geomorphology		
Mainly rock platform	Deep vermilion	
Mainly sand	Ultramarine	
Mainly alluvial/marine mud	Venetian Red	
Marsh	May Green	
Coast Edge		
Low edge (<5m)	Thin black line	
Cliff (>5m)	Solid black line	
Man made barrier	Black line with spines	
Shingle beach	Small circles	oooooo
Human disturbance	Black carats	^^^^^^



MAP 19: EROSION

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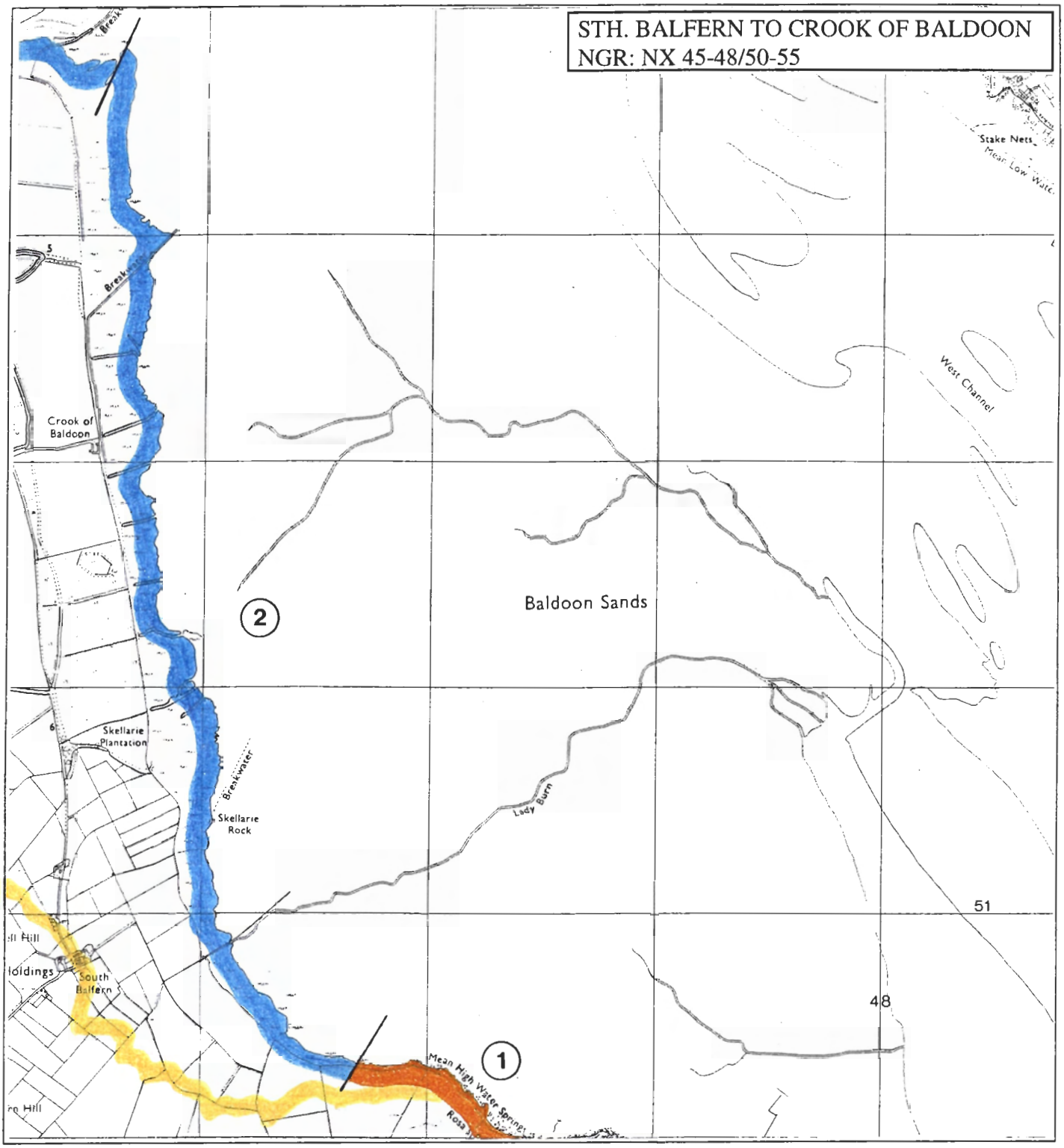
1. INNERWELL POINT to the north of CHAPEL HILL
NX 475 497
3.5km
Eroding or stable
This unit consists of slowly eroding rock platform in between stretches of sand and shingle. The cliff-edge is exposed but stabilised by vegetation. The intertidal area is wide and consists of sand.

2. North of CHAPEL HILL
NX 450 520
5km
Both accreting and stable
This region forms the lower estuary of Wigtown Bay and is a salt marsh (Merse) formed from the reclamation of alluvium development. Breakwaters have been employed to reduce sediment drift along the coastal edge. Drains intersect the marsh at regular intervals. Mud is accreting forming steep banks. Arcuate slope failure on the inner channel edges near the HWM shows that this region is dynamic and prone to occasional erosion.

STH. BALFERN TO CROOK OF BALDOON
NGR: NX 45-48/50-55



KEY

Erosion class	Derwent Code	Colour
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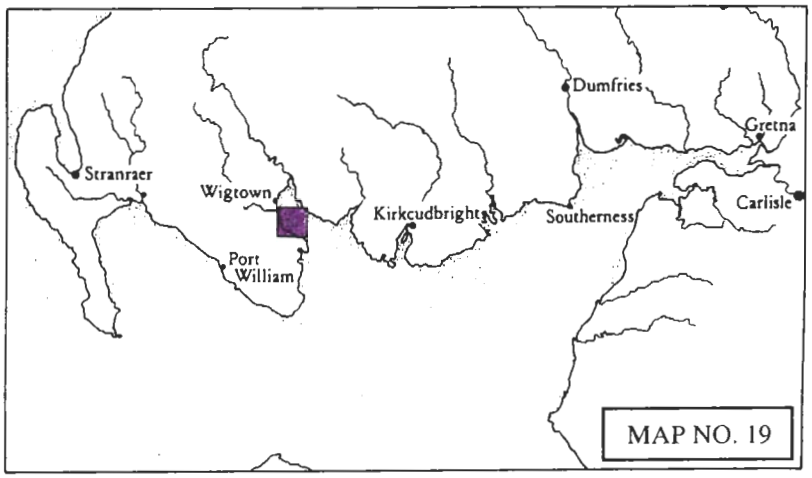
Accreting/stable	Light Blue	
Stable	Grass Green	
Stable/eroding	Deep Chrome	
Definitely eroding	Deep Vermilion	
Both accreting and eroding	Imperial Purple	
No access	Blank	
Land below 10m	Straw Yellow	

MAP CLASS: **EROSION**
Assessment date: 01.10.96
Scale 1:25 000



MAP 19: BUILT HERITAGE AND ARCHAEOLOGY

Sites on the Coast Edge & Foreshore

NX 4750 5002
INNERWELL PLANTATION
Fishing Net Stakes
19/20th century
Good
Nil

NX 4470 5223
SKELLARIE PLANTATION
Causeway Foundations
20th century
Good
Nil

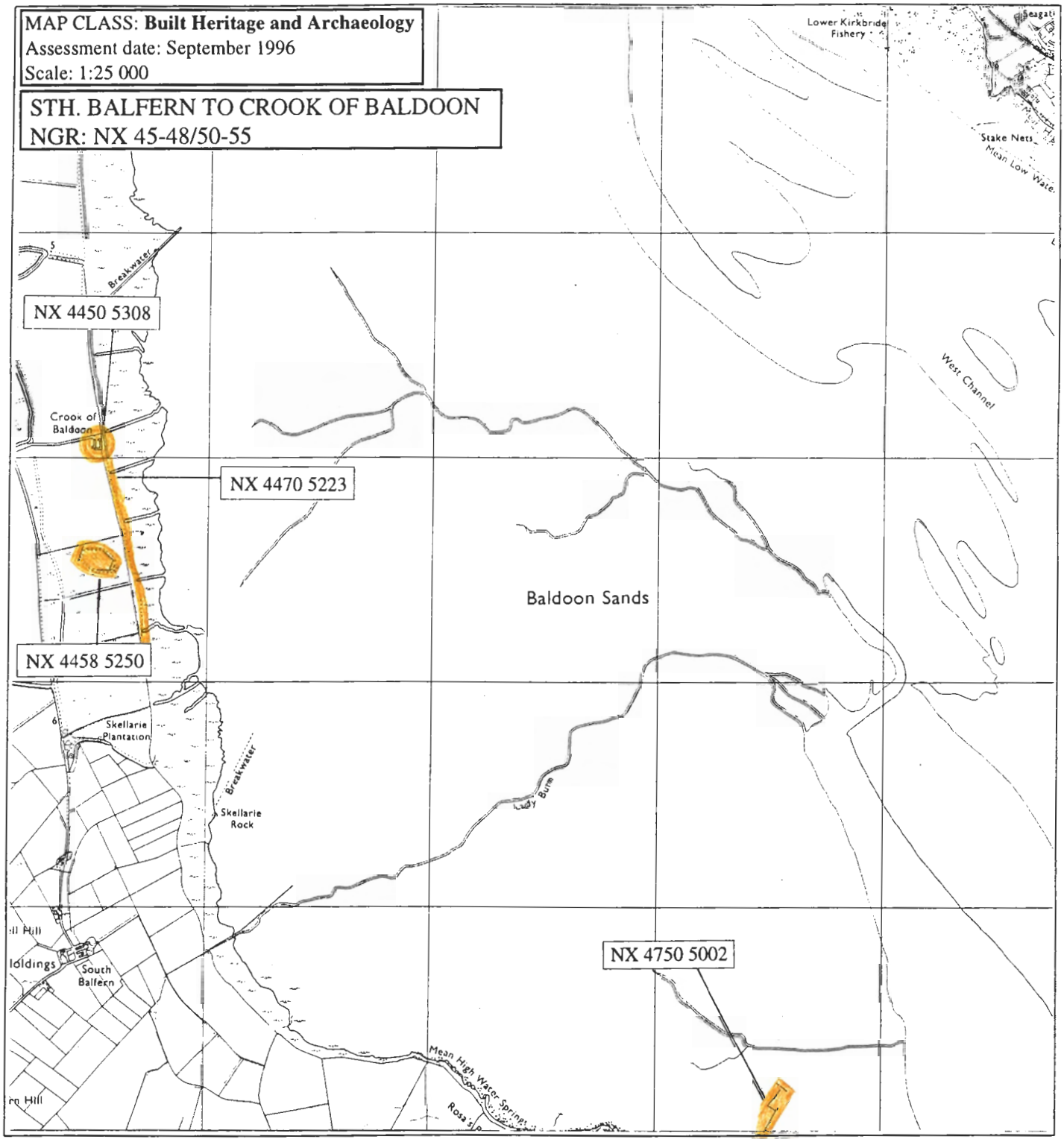
Sites in the Hinterland

NX 4458 5250
CROOK OF BALDOON
WW2 Coastal Defence Structure
Mid 20th century
Good
Nil

NX 4450 5308
CROOK OF BALDOON
Disused Farmhouse
19/20th century
Good
Nil

MAP CLASS: **Built Heritage and Archaeology**
Assessment date: September 1996
Scale: 1:25 000

STH. BALFERN TO CROOK OF BALDOON
NGR: NX 45-48/50-55



KEY

Site location	Symbol	Colour	Significance
NGR ref. - eg. NX 143 368	Roundel - Solid, (or area)	Red	Protected Ancient Monument
	Cross	Red	Listed Historic Building
	Roundel - Open, (or area)	Red	Monument formally proposed by Historic Scotland for designation
	Roundel - Solid, (or area)	Yellow	Other known Ancient Monument
NMRS ref. - eg. NX13 SW17	Dashed outline	Yellow	Gardens/Designed landscape
	Roundel - Solid, (or area)	Yellow	Undesignated wreck
	Area	Green	Insufficient information; more work needed
	Area	Blue	Probably archaeologically sterile