Historic Seascape Characterisation: Demonstrating the Method

Section 2: Application Review

Version 1.5

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Report Structure

The project report for HSC: Defining the method is divided into three sections for ease of use. The first documents the project's implementation. The second contains the application review and case studies, while the third contains the HSC character type text descriptions.

This document comprises section 2 of the HSC: Demonstrating the Method Project.

Section 2: Application Review and Case-studies

Contents

1. INTRODUCTION

The Application Review is designed to identify and demonstrate the capabilities of Historic Seascape Characterisation and its potential for application to a range of planning and outreach scenarios. The review seeks to illustrate how HSC can enable the historic character of our present coastal and marine seascapes to play its full part in shaping culturally distinctive and legible seascapes for the future, using a series of case-studies to support the discussion.

2. AIMS AND OBJECTIVES

The review of HSC applications has been approached in two phases. In the first instance a review of the potential applications of HSC was undertaken. A series of case-studies were then identified to illustrate how HSC could be used for a range of scenarios.

The Application Review considered the applications of HSC to wider contexts. The Review considers the following broad applications:

- Informing sustainable management of change, spatial planning, research planning and outreach
- Producing a HSC which is fully compliant with HLC principles
- Producing an HSC which meets the user needs of English Heritage while adhering to data standards implied through the Draft Marine and Coastal Access Bill (Defra, 2009c)
- Documenting the relationship between historic and natural environmental character
- Contextualising and enhance the application of the National Monument Record, Historic Environment Records and Maritime Record
- Informing and contextualise the development and updating of Rapid Coastal Zone Assessment Surveys
- Stimulating further research relating to the coastal and marine historic environment
- Improving awareness, understanding and appreciation of the marine historic environment

In order to contextualise the discussion, the review looks at the relevance of HSC to the following national and international government contexts.

- UK Legislation, including the marine planning infrastructure and the responsibilities of English Heritage
- EU Marine Policy and the
- European Landscape Convention
- Climate Change and the Historic Environment

The case-studies were selected to address as many of the following issues as possible:

- Informing forthcoming Marine Spatial Planning and Coastal Access provision

- Development Control, land use and Local Planning
- Aggregate Extraction and Offshore Construction Licenses
- Coastal Management
- Rapid Coastal Zone Assessments (RCZA)
- Shoreline Management Plans (SMP)
- Marine Conservation Areas
- Regional Research Frameworks
- Integrated Coastal Zone Management (ICZM)
- Outreach and Education

To this end, three case-studies were selected through communication with members of the Project's Management Board and with advice from relevant industry representatives and potential case-study subjects.

3. BACKGROUND

3.1 HLC/HSC

Characterisation is designed to be a constructive and effective method for informing the management of change in the whole environment, whether historic or natural. It can provide frameworks for informed conservation and management at many levels and scales, from local to national, complementing rather than replacing methods of selective designation and protection but capable of giving context to designation decision-making too (English Heritage, 2008).

Historic Landscape Characterisation (HLC) and Historic Seascape Characterisation (HSC) are both based on a process of creating a comprehensive and generalised, largely neutral and descriptive understanding of the cultural and historic character of an area or a topic. The approach involves bringing together existing, often unconnected, knowledge, normally at a high level of generalisation, to create a broad understanding of the essential characteristics of parts of the historic environment such as the townscape, the rural landscape, the military heritage, or coastal and marine seascapes (English Heritage, 2008).

Focussing at the scale of the landscape/seascape carries many particular advantages. Among these:

- it promotes new perspectives relating to the individual records of the historic environment,
- it enables and justifies a proactive approach focussing on historic processes and extending beyond the limits of sites already known,
- it corresponds with the scale of analysis already used by most agencies and spatial planners concerned with the natural environment, allowing the historic environment to take its place within an integrated approach to sustainable environmental management.

The HLC methodology is being applied across England, in multiple contexts including county based HLC, urban HLC, AONBs and National Parks, undertaken predominantly by Council HERs. To date HLCs covering over 75% of England are either underway or complete.

It is anticipated that the development of HSC will be applied to meet management requirements for the coastal and marine environment across a range of government bodies. The multimedia output accompanying HSC databases facilitates communication of its information to workers in other professions and provides a user-friendly resource for applying HSC in outreach and education.

3.2 UK Legislation

Since the 1990s, EU and UK Governments have sought to gain a better understanding of coastal and marine environments and their processes to provide the necessary information base for prospective strategic planning and long-term management of the marine environment (Hooley, in press).

Responding to the review of policy relating to the historic environment, *Power of Place, The Future of the Historic Environment* (English Heritage 2000), the government produced a statement on the historic environment, *A Force for Our Future (*DCMS/DTLR, 2001*),* setting out plans to produce:

- An inspiring education resource
- More attractive towns and cities
- A prosperous and sustainable countryside
- World class tourist attractions
- New jobs

The report contains a number of recommendations, for Government itself, for the heritage sector, and for local authorities.

The document recognises that, *'Historic landscapes or iconic buildings can become a focus of community identity and pride'* demonstrating the value of understanding character as an intricate part of the historic environment. The report also talks of the need to expand the knowledge base for policy making, giving exemplars of mapping marine archaeological features using GIS. It also recognises the value of Historic Landscape Characterisation, identifying *'management implications and opportunities for change and development, using the historic landscape character to enrich the future landscape'* (DCMS/DTLR 2001). It *'commends character assessment to local authorities both as a useful tool in itself and as a way of encouraging greater involvement by local communities in conservation issues' (DCMS/DTLR 2001).*

The focus of European and UK legislation for the management of coastal and marine environmental resources focuses increasingly on an integrated spatial approach to marine planning.

In 2002, DEFRA produced a report entitled "*Safeguarding Our Seas: A Strategy for the Conservation and Sustainable Development of our Marine Environment*". This report suggested the future vision for the marine environment should be clean, healthy, safe, productive and biologically diverse. These priorities are to be met through the integration and development of coastal and marine databases to encourage a more integrated approach to marine planning.

To assist in achieving this aim, the UK government consulted long and widely in its preparation for the Marine and Coastal Access Bill (DEFRA, 2008). The Bill, currently in progress through its Parliamentary stages (June 2009), will seek to implement a new strategic, plan-led system of marine planning, administered by a Marine Management Organisation (MMO), to deliver economic, social and environmental objectives within an

integrated approach to the sustainable management of the marine area around the UK (Defra 2008, 3.10-3.14).

On 4 December 2008 the Government introduced the Marine and Coastal Access Bill into Parliament. The Bill helps fulfil the Government's 2005 election manifesto commitments to introduce a new framework for the seas based on marine spatial planning, that balances conservation, energy and resource needs, and to improve access to the English coast.

The Bill responds to increasing pressures on our coasts and seas, and the associated impacts on coastal and marine ecosystems arising from man's present activities on land and sea. It will introduce a new forward-looking, strategic spatial planning system for the sustainable use and protection of the marine environment. The Bill allows for the creation of protected Marine Conservation Zones (MCZs) and will also introduce a new right of recreational access to coastal land around England.

The main priorities of the Bill are to:

- Sets up a new Marine Management Organisation under which many of the existing, diverse areas of marine regulation would be centralised
- streamlines the existing marine licensing system and provides powers to create a joined-up marine planning policy
- introduces new measures to reform fisheries management
- provides a framework for establishing marine conservation zones
- enables the creation of a walkable route around the English coast.

(http://services.parliament.uk/bills/2008-09/marineandcoastalaccess.html)

The MMO will be responsible for managing the production of marine plans produced to meet the requirements of the national Marine Policy Statement, considering a broad range of physical, environmental, social, cultural and economic characteristics as well as infrastructure such as communication, energy and transport systems (DEFRA, 2009a). The MMO will also be operating in accordance with the new Marine Policy Statement (MPS), which will state *"general policies (however expressed) of [the policy authorities] for contributing to the achievement of sustainable development in the UK marine area"*(Joint Committee on the Draft Marine Bill, July 2009) (DEFRA, 2009b). This will set out policies and priorities for the marine area and how it should be managed to achieve sustainable development.

The Marine and Coastal Access Bill Policy Document (DEFRA, 2009c) explicitly recognises the vital part that data coverage, quality, standards, accessibility and inter-operability will play in the operation of the new system, noting among others the key roles of the Marine Environmental Data and Information Network (MEDIN) and the UK Marine Monitoring and Assessment Strategy (UKMMAS) in achieving that (Defra, 2009c, 1.28). The spatial data requirements by the MMO will be significant given the spatial emphasis of the Marine Plans outlined for the Marine and Coastal Access Bill (Defra, 2009c, 3.18).

HSC is designed to inform the objective of a long-term and sustainable system for managing our marine environment expressed within the Marine and Coastal Access Bill (Defra, 2009c) by providing a strategic scale characterisation of human activity across English and adjacent UK Controlled Waters. The resulting HSC can be applied to marine spatial planning contexts well beyond heritage management, informing a broad range of applications concerned with planning our distinctive future seascapes and coastal landscapes.

English Heritage are responsible for advising on the development of sustainable approaches to the strategic management of the coastal and marine environment through the implementation of initiatives such as integrated coastal zone management, the development of shoreline management plans and the long term management of coastal change. English Heritage meet the requirements of UK government to manage the direct impacts of climate change on the historic environment while ensuring that the development of mitigation measures minimise potential impacts on the historic landscape (English Heritage 2008).

3.3 EU Framework and Regulations

European marine planning policy closely mirrors the UK approach to seeking more sustainable management of the seas (EC 2007a; EU 2008; Defra 2008; UK Parliament 2008), further highlighting the need for holistic, area-focussed GIS databases to convey historic cultural character at a strategic level (Hooley, in Press).

The key policy documents which reflect EU marine planning priorities include the EC Integrated Maritime Policy (EC 2007a) and the Marine Strategy Framework Directive (EU 2008) which provides the environmental pillar in support of the Policy.

The Action Plan for the EU Integrated Maritime Policy (EC 2007b), seeks to coordinate the management of maritime activity using common principles for marine spatial planning and ICZM to achieve an integrated approach to meeting economic, social and environmental commitments. This approach is fundamental to achieving sustainable development and meeting the aims of the Marine Strategy Framework Directive.

EU Maritime Policy (EC 2007a 3.2.3), recognises the need for comprehensive and interoperable mapped information to optimise the effectiveness of marine spatial planning. The outputs from the HSC programme are fully in accord with that. It is also recognised the need for integration and involvement of coastal communities in the sustainable management of the marine and coastal environment (EC 2007a, 4.3). The HSC multimedia output will provide a flexible, and accessible resource for education and outreach in initiatives developed to target coastal communities.

The Marine Strategy Framework Directive aims to provide the framework for achieving good environmental status for Europe's marine environment (EC 2008), tackling the deterioration of Europe's marine environment, the poor knowledge base about that environment and the institutional barriers to addressing these problems that exist at European level.

It is widely recognised that historic processes play an important role in shaping our past and present natural environment at both strategic and detailed level. The EU therefore recognises that the implementation of the Strategy by the Directive needs to include an understanding of the environment's historic cultural dimension in the same manner as is recognised by the UK's Marine and Coastal Access Bill and its preceding White Paper.

Implementation of the European Landscape Convention (ELC) which came into force in the UK on 1 March 2007 (www.coe.int/t/e/Cultural_Cooperation/Environment/Landscape/) also highlights the Council of Europe's recognition of the need to take account of cultural landscape during the development of EU marine strategy. The ELC is underpinned by a requirement 'to recognise landscapes in law as an essential component of people's surroundings, an expression of the diversity of their shared cultural and natural heritage, and a foundation of their identity' (*ibid*, Article 5). In emphasising the central roles of human perception in defining landscapes and of human activity in creating them, the ELC embodies concepts already at the heart of all historic landscape and seascape characterisation work (*Conservation Bulletin* **47**; Clark et al 2004, Hooley 2007). English

Heritage published an action plan for implementing ELC (English Heritage 2009) which seeks to use the plan as an opportunity to promote better recognition of the historic dimension of landscape in the marine zone through the promotion of HSC and the development of new legislation and procedures.

4. APPLICATION REVIEW

4.1 Introduction

Historic Seascape Characterisation (HSC) is designed to inform the management of change affecting our landscape through the provision of an archaeologist's perspective of the character of the historic dimension of the coastal and marine environment. It uses the same principles and complements the application of Historic Landscape Characterisation (HLC) to terrestrial landscapes.

The following three case-studies look at how HSC could benefit the wider community from both planning and awareness-raising perspectives. They provide valuable insight into the areas in which HSC could be applied.

The review's discussions consider how the HSC can:

· Inform the sustainable management of change, spatial planning, research planning and prioritisation, and outreach affecting the historic environment in the coastal and marine zones
· Produce a HSC GIS-database fully compliant with the principles of HLC, with the present and anticipated user-needs of English Heritage and with available standards for data content, management, inter-operability and accessibility developed to meet the implications of the draft Marine and Coastal Access Bill (Defra 2008)
· Document the close inter-relationships between historic and natural environment character and the advantages of inter-operability between historic and natural environment spatial datasets
· Enhance and provide landscape-scale contextualisation of the Maritime Record of the National Monuments Record, the County HERs and the Rapid Coastal Zone Assessment programme
· Structure, inform and stimulate future research programmes and agendas relating to the coastal and marine historic environment
· Improve the awareness, understanding and appreciation of the historic dimension of the coastal and marine environment to its professional and non-professional users

The key applications identified through discussion with stakeholders and via the case-studies fall into the following categories:

Management and Planning

- Landscape and Seascape Management
- Meeting English Heritage Management Requirements
- Cross-disciplinary Marine Environmental Management

Resourcing

- Data access
- Research planning

Education and Outreach

- Industrial outreach
- Adult education and training

- Children's education
- Public awareness raising

4.2 Management and Planning

4.2.1 Introduction

The current HSC programme was designed to meet English Heritage's requirements to inform the management of change in the marine environment on multiple scales through a broad range of applications.

English Heritage is the Government's lead advisory body for the historic environment and has a statutory role to support government organisations at a national and international level in implementing the planning system both on land and for the marine historic environment out to the 12nm limit. To this end, English Heritage are also responsible for funding strategic research to develop the information base on which they make their decisions.

The management of change in the historic environment ties in to a broad range of policies and legislative structures, designed to meet the needs of the UK Government and the EU to understand the impact of pressures on the marine environment, assessing whether the impact is of significance, and evaluating alternative management strategies (Defra, 2009).

While being the statutory responsibility of English Heritage, the requirement to take account of the historic environment also falls within the remit of policy makers, other curators of the marine and coastal environment as well industrial stakeholders through the implementation of UK and EU laws, agreements and policies, such as the European Landscape Convention (Council of Europe, 2000) and the Marine and Coastal Access Bill (Defra, 2009c). The applications review discusses the potential benefits of the HSC in fulfilling their needs as well as those of English Heritage.

4.2.2 Landscape and Seascape Management

The HSC National Method Statement (Tapper, 2008) details the principles underpinning HSC, following the principles already applied in Historic Landscape Characterisation

The HSC methodology allows for the interpretation of character to take place, combining the sensory and the cognitive, across different levels of the marine and coastal environment, allowing an understanding, for example, of the dominant cultural processes taking place in the water column, to be differentiated from or compared to those taking place on the sea surface. The assessment of historic character at each level allows the user to differentiate the complex relationships between those tiers in respect of the cultural and historic activities characterised.

The European Landscape Convention (ELC), is part of the Council of Europe's work on natural and cultural heritage, spatial planning and the environment. The ELC, also known as the Florence Convention, was adopted on 20 October 2000 in Florence (Italy) and came into force on 1 March 2004 (Council of Europe, 2004, Treaty Series no. 176). It promotes the protection, management and planning of European landscapes and organises European co-operation on landscape issues. It is the first international treaty to be exclusively concerned with all dimensions of the European landscape. The HSC programme substantially contributes towards fulfilling UK commitments under the Convention which came into force in the UK on 1 March 2007. (http://www.coe.int/t/dg4/cultureheritage/Conventions/Landscape/)

The ELC defines landscape as '*an area, as perceived by people, whose character is the result of the action and interaction of natural and/or human factors*' (Council of Europe, 2000, Article 1). That is underpinned by a requirement for a reflection of the diversity of their shared cultural and natural heritage, and a foundation of their identity (*ibid*, Article 5). The ELC takes account not only of landscapes relating to land but also those reflecting coastal and marine areas (*ibid*, Article 2).

The Framework for Implementation of the European Landscape Convention in England aims to:

- Improve performance within the current legal and regulatory frame.
- Influence future legislation, regulation and advice, including contributing to gap analysis.
- Improve the understanding of landscape character and dynamics, and the monitoring of change and trends.
- Engage people through comprehensive and accessible awareness and understanding activities as well as through, promotion, education & training.
- Share experiences and best practice.

The ELC requires us to engage in the understanding and management of our dynamic landscapes everywhere in a manner which recognises them as diverse as the human perspectives which consider them and the complexities of cultural and natural forces apparent to those perspectives.

The concepts underpinning HLC and HSC strongly mirror the principles upon which ELC is founded (English Heritage, 2008):

The ELC defines landscape as 'an area, as perceived by people, whose character is the result of the action and interaction of natural and/or human factors' (*ibid*, Article 1). That is underpinned by a requirement 'to recognise landscapes in law as an essential component of people's surroundings, an expression of the diversity of their shared cultural and natural heritage, and a foundation of their identity' (*ibid*, Article 5).

In emphasising the central roles of human perception in defining landscapes and of human activity in creating them, the ELC embodies concepts already at the heart of all historic landscape and seascape characterisation work (*Conservation Bulletin* **47**; Clark et al 2004).

The scope of the ELC specifically includes 'marine areas' as well as 'land' and 'inland water' (*ibid*, Article 2) and, in common with HLC and HSC, it takes a holistic approach, concerning 'landscapes that might be considered outstanding as well as everyday or degraded landscapes' (*ibid*, Article 2): the commonplace and poorly regarded as well as the special.

The ELC requires each party where it is in force 'to identify its own landscapes throughout its territory' and 'to analyse their characteristics' (*ibid*, Article 6): those are fundamental tasks of any HLC and HSC (see App. A, 1) above) and the applications which HLC/HSC are designed to inform (see Clark et al 2004) are directly aligned with the requirements in the ELC to analyse 'the forces and pressures transforming [those characteristics]' (*ibid*, Article 6) and 'to establish and implement landscape policies aimed at landscape protection, management and planning' (*ibid*, Article 5).

The ELC requires us to engage in the understanding and management of our dynamic landscapes everywhere in a manner which recognises them as diverse as the human

perspectives which consider them and the complexities of cultural and natural forces apparent to those perspectives.

Methodologies embodying the principles of HLC provide effective tools to provide that necessary comprehensive understanding at landscape scale, capable of accommodating a range of perspectives and queries, not only those of historic environment specialists, and interoperable with natural environment datasets (Fairclough 2002a, 2007a & b). In demonstrating the practicability of such a methodology for England's coastal and marine zones, this project will make a substantial contribution towards meeting our commitments under the ELC (Hooley, 2007).

4.2.3 Meeting EH Management Needs

4.2.3.1 Policy Requirements

English Heritage and local planning authorities represent the first point of contact for seeking advice on proposals for change in the historic environment. The provision of advice to local planning authorities and government departments on development proposals affecting the historic environment is dependent on having a firm information base on which to base their advice.

The National Heritage Act (OPSI, 2002) provided English Heritage with the additional responsibilities for maritime archaeology in English waters by extending the remit of its responsibility out to the 12 nautical mile limit of England's share of UK Territorial Waters. Across that area and beyond, to the full extent of UK Controlled Waters, English Heritage Maritime Archaeology Team also provides historic environment input to Strategic Environmental Assessment (SEA) and Environmental Impact Assessment (EIA) of plans, programmes, licence and development proposals as required by EU Directives.

As already demonstrated through the applications of Historic landscape Characterisation to the management of change on land (Clark et al 2004), the implementation of HSC across UK Controlled Waters will be a major advance in enabling English Heritage to meet both its statutory and *de facto* responsibilities relating to the management, research and improved public understanding of, and accessibility to, the historic environment across that area.

HSC contributes substantially towards the needs of English Heritage to manage the marine historic environment by addressing the priorities for the following areas:

- Addressing the priorities published in Taking to the Water' (Robert & Trow 2002)
- Meeting the research themes and strategy objectives as set out by English Heritage in 'Discovering the Past, Shaping the Future, Research Strategy 2005 - 2010' (English Heritage, 2005)
- Providing a basis for accounting for the historic environment during marine spatial planning, meeting the requirements of the UK Marine Bill White Paper (Defra 2007)
- Supporting the development of a European marine planning infrastructure to support sustainable management and development of the marine environment (EC 2007)
- Meeting the requirements of the UK to support the European Landscape Convention in recognising the significance of the cultural and natural landscape (http://www.coe.int/t/dg4/cultureheritage/Conventions/Landscape)

- Contributing towards the policies of Integrated Coastal Zone management (ICZM) (Defra 2008)

The publication of "*Taking to the Water*" (English Heritage, 2002) outlined a strategic approach and recommendations for managing maritime archaeology in England. It highlighted the need for an approach which was tailored to the needs of the marine environment to be adopted, beyond the legislative and planning regime regarded as routine in terrestrial heritage. HSC contributes towards that by providing a strategic-level framework for its understanding and management.

English Heritage supports a broad range of Regional Research and planning frameworks (English Heritage, 2002). HSC facilitates the inclusion of the coastal and maritime landscape in regional research frameworks by providing comprehensive baseline information on that aspect.

HSC also links strongly to wider agendas in the Government's policy directions and priorities for the historic environment as expressed in *The Historic Environment: A Force for our Future* (DCMS/DTLR 2001), complementing the characterisation of England's land area and promoting an integrated, partnership approach to marine resource management with other agencies and interests both on land and at sea.

4.2.3.2 Coastal Management

A broad range of management frameworks exist for the coastal, estuarine and inter-tidal areas although they often limit themselves to near-shore areas when making assessments below Mean High Water. English Heritage and in many cases, individual local authorities, are responsible for informing initiatives towards the implementation and review of Integrated Coastal Zone Management (ICZM) and Shoreline Management Plans (SMPs), both designed to integrate long-term policy decision-making and strategic planning relating to the coastal zones. Rapid Coastal Zone Assessment Surveys (RCZAS), are being undertaken across all areas within English Heritage's remit to enhance the coastal historic environment record and inform such initiatives.

Many of Europe's coastal zones face problems of deterioration of their environmental, socio-economic and cultural resources. Integrated Coastal Zone Management (ICZM) is an approach promoted by the European Commission through the EU ICZM Recommendation (EU 2002) to bring together consideration and management strategies to address the many inter-related biological, physical and human problems presently facing these zones. Their cause can be traced to a range of underlying problems related to a lack of knowledge, inappropriate and uncoordinated laws, a failure to involve stakeholders, and a lack of coordination between the relevant administrative bodies (EC 2000).

The approach aims to promote a collaborative approach to planning and management of the coastal zone, within a philosophy of governance by partnership with civil society. UK Government action towards integrated coastal zone management (ICZM) (Defra 2008) is in line with implementing the EU recommendation for a stocktake and national strategy formulation (EU 2002).

HSC is the only available source of comprehensive area-based data on the typical historic character of our coastal zone, a context essential to feed into ICZM considerations as it provides a key to understanding coastal distinctiveness, diversity and cultural legibility. Sustainable management through the application of ICZM principles will seek to retain those aspects for future generations to enjoy in their coastal

landscapes. HSC could in time, also contribute to the benchmarking of change in coastal character.

SMPs provide a large-scale assessment of the risks associated with coastal processes and present a long term policy framework to reduce these risks to people and the developed, historic and natural environment in a sustainable manner. Shoreline Management Plans (SMPs) are developed at a strategic level to provide a basis for developing long-term policies for coastal management (McInnes 2003, 50-61). An SMP should "*provide the basis for policies for a length of coast and set the framework for managing risks along the coastline in the future" and "identify the best approach or approaches … over the next 100 years*" (Defra 2006).

A second round of SMPs is currently under way to ensure full account is taken of latest information and future challenges. HSC would provide a valuable tool in this instance for providing context to all aspects of the marine environment evaluated in the plan. From a heritage perspective, while SMPs currently focus primarily on the assessment of risk to individual historic assets along the coast, as well as putting these assessments in a broader regional context, HSC enables an assessment of threats to the broader character of a coastal landscape as well as to individual sites to be made, analogous to the considerations of both species and habitats in SMP ecological assessments.

Defra's revised *Shoreline Management Plan Guidance* (Defra 2006) highlights the need for more consistent, integrated datasets, specifically noting the scarcity and inconsistency of data on archaeological potential and value and lack of information on a strategic level (Defra 2006, Appendix B.2). The consideration of historic character types will enable a better understanding of the historic processes that have taken place in a given area, hence the likely ranges of archaeological features corresponding with those processes that may be present, whether or not they have yet been confirmed by actual discoveries. HSC on a regional scale will improve the considered assessment of these issues, with explicit justifications, and will provide a context for site-specific assessments of potential during localised investigations.

Defra's 2006 SMP Guidance was supported by *Shoreline Management Plan Review and the Historic Environment: English Heritage Guidance*, which notes the role of HLC in understanding the historic dimension of landscapes (English Heritage 2006a) and builds on an earlier Guidance Note relating more specifically to coastal defences and the historic environment (English Heritage 2003).

The programme of Rapid Coastal Zone Assessment Surveys (RCZAS), funded by individual local authorities, is designed to enhance and update the coastal HER, through a two-phased approach. Phase 1 (Desk-based Assessment) draws on data from aerial photographs, LiDAR, historic maps, the local authority Historic Environment Records, the National Monuments Record and other sources, to make an assessment of the data available, the nature and character of historic environment within the project area, and potential threats to heritage assets, in order to design a strategy for phase two which prioritises areas where heritage assets may be most at risk. Phase 2 (Field Assessment) comprises a rapid walk-over survey, designed to verify records from Phase 1, locate and characterise site types not visible from the air, assess significance and vulnerability.

HSC is well positioned to provide valuable context during the interpretation of available data during Phase 1 in order to present a considered assessment of the heritage assets in the area. It provides a broader perspective on the cultural character of the present coastal environment and the processes that have helped to form it. It also highlights the processes which determine the types of sites likely to be present but as yet unrecognised

along the coastal and intertidal zones. Working in a complementary manner, HSC will provide the landscape-scale contextualisation of the coastal HER enhancement resulting from the current programme of RCZAS.

4.2.3.3 Climate Change and the Historic Environment

The management of change affecting the historic environment in the context of potential impacts from climate change is a key priority for English Heritage. A policy statement setting out English Heritage's thinking regarding the implications of climate change was published in 2008 (English Heritage, 2008). It recognises the potential impacts from climate change, such as sea level rise, extreme weather conditions and hydrological change on the historic landscape as well as the possible effects of mitigative measures in response to climate change such as the development of sea defences or renewable energy resources.

English Heritage recognises that such impacts should always be taken into account when policy is being formulated and English Heritage is committed to working with others to avoid or minimise any adverse impacts, while delivering the necessary changes.

The output of HSC will provide a valuable resource in informing government agencies on the character of the different parts of the coastal and marine environment during policy making and during the assessment of potential impacts of new developments during EIA.

Additionally, it must be recognised that, as well as impacting the historic landscape, climate change also plays an important part in defining the character of some coastal and marine areas, through the construction of sea defences, onshore and offshore windfarms, the presence of rapidly eroding coastlines or the reclamation of coastal areas all of which play a key part in defining the historic character of a landscape or seascape.

4.2.3.4 Development Control and Marine Planning

Introduction

The long term aims of EU and UK legislation, through the development of the Marine and Coastal Access Bill and Integrated Maritime Policy, respectively, are to achieve a status quo where all government organisations and sub-disciplines across Europe are inherently driven by a hierarchy of overlapping and inter-related policies and initiatives which drive the long-term strategic management of our seas.

The Marine and Coastal Access Bill will be implemented in part through the creation of a new Marine Management Organisation (MMO), responsible for delivering many of the Bill's objectives. The new organisation will be a centre of marine expertise, providing a consistent and unified approach, delivering improved coordination of information and data and reducing administrative burdens. The integration of marine management will provide benefits from joined up delivery and economies of scale that could not be realised by placing those functions in separate organisations.

The government bodies dealing with the management and protection of the different aspects of the marine environment, such as Natural England, English Heritage and the Environment Agency share similar and overlapping responsibilities. Marine Plans need to take account of the cultural and historic dimensions of the environments they encompass. Similarly, development-led desk based assessments must take account of the relationships between nature and human activity in order to interpret potential risks and impacts of proposed activities, and more generally to plan for sustainable futures.

Strategic Planning

The Marine Coastal & Access Bill will create a strategic marine planning system that will clarify our marine objectives and priorities for the future, and direct decision-makers and users towards more efficient, sustainable use and protection of our marine resources. The first stage of this marine planning system will be the creation of a marine policy statement to create a more integrated approach to marine management and setting both our short and longer-term objectives for sustainable use of the marine environment. It is then intended that the second stage will be the creation of a series of marine plans, which will implement the policy statement in specific areas, using information about spatial uses and needs in those areas.

One of the Govt Amendments to Clause 52(2)(a) of the Bill passed in the Lords in May 2009 highlights the need for the historic and archaeological characteristics of a region to be considered in the identification of marine plan areas and in the preparation and review of marine plans. (Hansard; 5 May 2009 : Column 473; http://www.publications.parliament.uk/pa/ld200809/ldhansrd/text/90505-0006.htm#0905057000472)

The HSC multimedia and GIS outputs will also provide a user-friendly, jargon-free first stop for decision makers to gain a broader understanding of the context of individual heritage sites they need to deal with.

Coastal Access

The Marine and Coastal Access Bill contains provisions for creating an access route around the English coast. Part 9 of the Bill places a duty on the Secretary of State and Natural England to secure a long distance route ("the English coastal route") and land available for open-air recreation accessible to the public around the coast of England. In doing so the Bill amends existing legislation – namely the National Parks and Access to the Countryside Act 1949 and the Countryside and Rights of Way Act 2000 (CROW Act 2000).

The Marine and Coastal Access Bill (Defra, 2009c) provides for public access on foot to certain types of land including areas of open land comprising mountain, moor, heath, down, and registered common land, It also increases protection for Sites of Special Scientific Interest (SSSI) and strengthens wildlife enforcement legislation, and provides for better management of Areas of Outstanding Natural Beauty (AONB). The Bill is designed so that some forms of land are exempt from the rights of access, depending on the nature of their usage, such as railways, golf courses quarries and aerodromes.

HSC provides a valuable resource both in the planning the coastal access route and to informing the information provision for the route's users. The HSC GIS, used in conjunction with baseline data required for planning, will highlight the character of different areas through which the route is being planned and help identify key areas where information for route users would be beneficial in raising awareness of the cultural and historical landscape of the coastal and marine zone. The text descriptions produced for HSC will provide a useful resource in the development of documentation and public information guiding users along the route.

The coastal access provision is a major awareness-raising opportunity and ties in to the public accountability needs of marine spatial planning in the rest of the Bill, allowing it to be accountable to a more informed public.

Development control

English Heritage initial maritime policy outlined in *Taking to the Water* (Roberts and Trow 2002) states that '*the principles set out in Planning Policy Guidance Note 16: archaeology and planning (PPG16) should be applied to the treatment of sub-tidal archaeological remains in order to secure best practice*'. PPG 16 advises that the preservation of archaeological remains is a material consideration within the planning process and sets out a presumption in favour of the physical preservation of nationally important archaeological remains. Where preservation *in situ* is not possible, PPG16 states that it is reasonable to require the developer to make appropriate and satisfactory provision for excavation and recording.

The publication of the draft Planning Policy Statement 15 (PPS15) on Planning for the Historic Environment July 2009 sets out the Department's planning policies to minimise flood risk to people, property and the environment. It recognises the risk of flood events to heritage and landscape assets and acknowledges that human activity and development can exacerbate such damage.

Since 2007 the extraction of marine minerals has been controlled through the *Environmental Impact Assessment and Natural Habitats (Extraction of Minerals by Marine Dredging) (England and Northern Ireland) Regulations 2007,* which incorporates the requirements of European Community EIA Directive 85/3337/EEC and the European Habitats Directive 92/43/EEC. This requires all applications for Government View to be accompanied by and environmental statement.

As stipulated in the historic environment guidance published by COWRIE (Wessex Archaeology, 2007), developers of offshore renewable energy schemes are under the same obligation to undertake EIA as the aggregate industry. The guidance specifies the need to review baseline information as part of this process, recommending a broad study area encompassing sources such as Strategic Environmental Assessments and Historic Landscape Characterisation where available (Wessex Archaeology, 2007). HSC, the method for which was finalised after the publication of this report, would provide a valuable addition in meeting the offshore renewable industry's requirements for information on a regional scale.

Under the JNAPC *Code of Practice for Seabed Development* published in 2007, the Government is committed to sustainable development in which archaeology is given appropriate assessment and consideration. The developer therefore has a responsibility to protect the UK's coastal and marine historic assets during coastal and offshore development. The JNAPC Code, jointly developed by marine archaeologists and industry, provides a framework within which the protection of these asserts as part of our cultural heritage, and the legitimate interests of maritime development, can be reconciled.' (JNAPC, 2005)

In addition to informing English Heritage's own responsibilities to advise during the production of environmental statements, HSC at the strategic scale produced by this project could be utilised by developers as initial baseline information to be used by industry as the *initial* baseline, and as a guide for further more in depth assessment of the historic environment during development and impact assessment. In no way should the use of this resource be considered as an alternative, or a substitute for full environmental assessment. It provides a valuable resource in informing curators and archaeological contractors during the commissioning of desk-based assessments, briefs, and evaluations for development proposals such as offshore windfarms, aggregate license areas, coastal defences or harbour developments.

The HSC text descriptions of character types provide an overview of the nature and scale of different human activities and marine features on both a regional and /or national scale, providing a good basis for providing advice and comment on proposed mitigation schemes. For most development proposals it is likely that compilation of a more detailed HSC for the development area will be necessary, probably as a planning requirement but in the interests of the developer anyway to inform their own forward planning for the historic environment considerations their proposed development will generate.

Designated Areas

Marine Conservation Zones (MCZs) and Marine Protected Areas (MPAs) are intended to provide protection for species and habitats considered of national value that cannot be protected under European law (Defra 2007, 65). In Lancashire and Suffolk, HLC has played an important role in helping to identify the location and extent of former habitats for English Nature's *Lifescapes* initiative (Clark et al, 2004). In the marine and coastal zone HSC can potentially assist in a similar way, helping the responsible organisations to identify the location and extent of former habitats for MCZs and describing the historic processes that have helped to form semi-natural Character Types such as Cliff, Coastal Rough Ground, Dunes, Saltmarsh and Sandflats, Foreshore Woodland and Water (Tapper, 2008).

Areas of Outstanding Natural Beauty (AONBs) were brought into being by the National Parks and Access to the Countryside Act of 1949. The Countryside and Rights of Way Act 2000 strengthened the conservation and management of AONBs in partnership with local authorities. Characterisation of the marine and coastal landscapes plays a key role in the development of management plans for the AONB, especially with the recognition that 'Natural Beauty' can include the result of man's management of the land.

The close relationship between the historical and natural environment is well recognised by curators of the coastal and marine environment. The impact of human activities over time can affect a wide range of aspects of the natural environment including biodiversity, the movement of sand along beaches and dunes, or the change in habitats along rivers and estuaries. The management of coastal and marine habitats can affect the character of the historic environment in the same way as the management of the historic environment must take account of potential impacts on natural habitats.

The AONB/EMS Management Plan assessed in Case-study 2, for example, recognises the close interrelation between the historical and natural environment, referring for instance to the location of golf courses on areas of former sand dunes, such as those at Embleton Links and Alnmouth (Northumberland Coast AONB Partnership, 2009, p 12).

Similarly, the development of local industries such as lime burning, quarrying and mining at Alnmouth has unarguably determined the present character of the town and the expression of the geological resources the industries depended on (Northumberland Coast AONB Partnership, 2009, p 12).

These relationships are explicitly illustrated through the HSC approach to characterising the coastal landscape, reflecting not only the more obvious human activities which produce industrial and leisure sites, but also the important roles of man's activity, whether deliberate or unintentional, in shaping the semi-natural environment. This approach, encompassing the principle that ***"****Semi-natural and living features (woodland, land cover, hedges etc.) are as much a part of landscape character as archaeological features;* ***human landscape – bio-diversity is a cultural phenomenon"*** (Clark et Al, 2004), serves to underline the intimate and now universal relationships between human cultural processes and the form of our environment: that the impact of historic cultural processes is truly a dimension of the environment. The interrelation between the historical and natural environment highlights the value of interoperability between HSC

and environmental spatial databases, enabling often unsuspected correlations and discrepancies in patterning between the cultural and other aspects to be identified and researched.

4.3 Data Management

HSC seeks to reflect best practice for data management and seeks to work in accordance with Guidelines for English Heritage projects involving GIS (Froggatt, 2004).

English Heritage are also working closely with the Marine Environmental Data Information Network (MEDIN) alongside other partners from the private and public sector, towards a set of agreed "public good" goals (see http://www.oceannet.org/). These aim to:

- Provide a data management and access framework for the UK marine data community;
- Develop marine data management standards, and protocols;
- Contribute to the marine component of the geospatial strategy for the UK; and
- Recommend actions and map progress towards achieving coordination of management of UK Marine Data.

HSC contributes towards MEDIN objectives by addressing these major government priorities:

- Marine data will be made accessible to the community in a format that is useful for all stakeholders; and
- Marine geospatial analysis will be undertaken through data enhancement and improving data quality which will enable integration of natural and historical environments datasets to allow informed decisions towards development control caseworks.

4.4 Research

In 1996, English Heritage's review document *Frameworks for our Past* identified the need for a greater emphasis on research within modern archaeology. The recommendation was for the formulation of Research Frameworks for each of the regions of England to provide a context and a common focus for archaeological work (Tapper 2008).

The English Heritage Research Strategy 2005-2010 (English Heritage 2005) establishes a five-year plan of action for the use of research to support our business, government priorities and the historic environment sector. It outlines English heritage's approach to improving the way archaeology, buildings and landscapes are interpreted and managed through a Heritage Protection Review. The value of HLC in supporting the new registration and public consultation process under the review is highlighted in the strategy under Theme A "*Discovering, studying and defining historic assets and their Significance*". HSC would provide additional perspective and a valuable resource for complementing HLC in these assessments when dealing with the coastal and marine environment. In addition, HCS's value lies particularly in "*helping people develop their understanding of the historic environment*" by providing a regional perspective of the character of the coastal and marine environment for education and the contextualisation of research.

HSC could be used alongside information bases such as the Marine ALSF database produced by ABPMer (http://www.marinealsf.org.uk/) the ADHS database and desk-based research, to assess gaps and coverage in research themes across England's

coastal and marine zones. The provision of a GIS output which is interoperable with other GIS databases will enable the comparison between datasets which could not previously be viewed together.

4.5 Outreach and Education

Raising public awareness, understanding and appreciation of the historic cultural dimension of the marine environment reflects one of the main aims of HSC.

HSC, as with HLC, accords well with the broad agenda set out for the historic environment sector in *Power of Place: the Future of the Historic Environment* (English Heritage 2000) and *The Historic Environment: a Force for our Future* (DCMS/DTLR 2001). These policy documents recognise the value of characterisation in facilitating the implementation of their agendas, ranking them as high priority among their future work.

In response to the educational demands, Government is seeking to promote a broader definition of the historic environment (DCMS/DTLR 2001, Part 2, p7). To ensure that policy-making takes account of this broader perception, recognising that the historic environment is not only valued through specialist interest for heritage management but importantly provides a key source of cultural identity.

An important use of HSC will be to act as a framework for outreach and improved community awareness of the marine historic environment. The multimedia resource provides a valuable resource as an educational tool, improving access to information on the historical character of the coastal and marine environment. The development of the concept of character assessment meets the needs of government to better understand and promote the historic environment on a broader scale, encouraging the involvement of local communities in conservation issues (DCMS/DTLR 2001, Part 2, p8).

The project's main products are the HSC GIS mapping and its accompanying multimedia resource. These are to be curated and made publicly available by the NMRC, Swindon, eventually contributing to a national HSC database. This project's multimedia and report outputs will also be archived and made available on the Archaeological Data Service (ADS) website.

These arrangements will give users access to the multimedia output of the project, which provides the key HSC resource for public outreach through a user friendly searchable online interface. It conveys the message that everywhere has historic character: the typical and commonplace as well as the rare and the special: all that is familiar and distinctive, whether highly valued or not, has relevance and is covered by HSC and HLC. It has relevance to the outlook of everyone who inhabits, uses or has any relationship to the coast or the sea.

Where industrial outreach initiatives are already in place, such as the Awareness Programme supporting the protocol for reporting Finds of Archaeological Interest (Wessex Archaeology, 2005) which seeks to encourage staff in the marine aggregates industry to report finds made in the course of dredging (Wessex Archaeology, 2006), the HSC multimedia output will provide a valuable resource for providing context to the artefacts that aggregate companies may find during dredging activities. Encouraging a greater understanding of how and why these artefacts exist on the seabed and how they fit into the broader contact of the marine historic and cultural environment, will help raise awareness of the marine environment and encourage a more enthusiastic approach to meeting the requirements of the protocol.

Equally, the implementation of the Marine and Coastal Access Bill (Defra 2008) will provide opportunity for promoting the use of HSC as a basis for improving access to

information on the historic character of the marine and coastal environment along the planned coastal access route through the use of information boards.

The level of information contained in the HSC multimedia output is suitable for secondary education, and could be simplified for application to a younger audience. Equally, HSC could be applied to a broad range of local educational initiatives similar to those identified in case-study 2. HSC provides a flexible and user friendly resource for connecting with and enhancing local communities' current awareness of the character, perceptions and significances of the areas they live and work in.

5. CASE-STUDIES

5.1 Introduction

Three case-studies have been selected in consultation with English Heritage and various stakeholders to provide scenarios to help demonstrate the application of HSC to marine planning from different angles.

The case-studies seek to demonstrate the roles of HSC in coastal and offshore planning, together with an educational exemplar, using recent or current projects and initiatives.

The three case-studies selected are designed to examine the following subjects:

1 – Desk-based archaeological assessment for Environmental Impact Assessment

2 – Strategic regional planning by central government such as Strategic Environmental Assessments (SEA), Regional Environmental Assessments (REA) or Regional Archaeological Assessments (RAA)

3 – Use of HSC as an educational tool for archaeological professionals, non-professional adults and school children through the demonstration and feedback gathered via outreach opportunities organised by the MA Ltd.

The results of each case-study have been described in below. Specific exemplars identified from the case studies have also been used in the Application Review in section 5 to highlight specific features of the Review.

5.2 Case-Study 1 – Regional Environmental Assessment (REA) for Marine Aggregates

5.2.1 Introduction

This case-study seeks to demonstrate the benefits of HSC in the assessment of historic and natural environmental parameters during the implementation of Regional Environmental Assessment (REA) process and the wider effects on planning process for marine aggregates and the industry as a whole. This assessment has been undertaken through the review of documents outlining the requirements and responsibilities of the marine minerals sector illustrated with the exemplars from potential and current aggregate license areas.

Applications for marine mineral extraction beyond territorial waters are currently regulated by the Marine and Fisheries Agency (MFA) section within Department of the Environment, Food and Rural Affairs (Defra). The aggregate industry has a Requirement to include "*a description of the historic environment likely to be significantly affected by a proposal*" as part of their environmental statements, including EIA and REA (BMAPA EH guidance, 2003).

"3.1 Any person wishing to undertake marine minerals dredging may wish to seek from the Secretary of State either written confirmation as to whether some or all of the Regulations apply to their proposal (a "screening determination") or an opinion on the information that needs to be included in an ES, if required (a "scoping opinion")." (MMG2, Defra, 2007)

The guidance specifies the historic environment as encompassing "*landscapes of historical, cultural or archaeological significance*" (BMAPA & English Heritage, 2003).

Regional Environmental Assessment (REA) lies outside the current formal application procedures and is a responsible initiative funded by industry undertaken by independent consultants. It provides a regional based assessment of potential, cumulative and in-combination environmental effects of dredging to provide context for site-specific environmental assessments (Cefas 2008). The output consists of *"a reference study which provides stakeholders with regional data, interpretation, an assessment of cumulative and in-combination effects and mitigation proposals on a regional scale"* (Posford Haskoning, 2002).

The case-study seeks to:

- Review the aims and objectives of the aggregates industry for REA
- Assess the benefits of HSC in meeting those requirements
- Review available REA reports to identify exemplars where HSC would contribute to the assessment
- Assess the benefits to the wider planning process for marine aggregates, i.e. benefits to SEA and EIA

Guidance in the production of REA was developed in 2008 by CEFAS following consultation with key industry stakeholders via a series of workshops (Cefas 2007)

The first REA for aggregate extraction was undertaken for the Eastern English Channel (Posford Haskoning, 2002). A second REA is currently being undertaken for the Anglian Offshore Region by EMU Ltd. Exemplars from published reports from these projects have been employed in the main discussion. In addition, two license application areas lying in this project's area were reviewed in the context of the REA and SEA guidance to look at how HSC could benefit the production of EIA and the hypothetical production of an REA for the area.

5.2.2 REA aims and objectives

Overall aim of REA is, "*to streamline the production of site specific EIAs, achieve efficiencies in data collection, and develop a robust approach to the analysis of data across geographic regions*" (Cefas, 2007)

The broader aims of REA are to:

1. Provide objective, evidence-based assessments of the distribution and importance of regional resources (living and non-living) and the potential impacts from the proposed activities on these resources, at a regional level.
2. Provide a context for site specific Environmental Impact Assessments (EIA) within the relevant REA area, and to identify site-specific issues that individual EIAs may need to focus on more specifically.
3. Provide an assessment of the impacts of different development scenarios of the aggregate extraction industry, based on industry projections, and in relation to those due to other human activities and natural variability.
4. Provide a robust assessment of cumulative and in-combination impacts at the regional level using consistent definitions and interpretations of such impacts, and thus contribute towards assessments of the magnitude and scale of such impacts in individual EIAs.
5. Make recommendations for monitoring to be addressed at the REA or individual EIA level and for research and development to address gaps in knowledge, understanding or assessment tools.

The key objectives of REA are:

- To assess key issues of risk to the marine environment
- To make best use of resources, specifically data collection, evaluation and assessment both now and in the future in the context of existing and future Government policy (for example Marine Spatial Planning/ecosystem approach)
- Key aim of REA associated with the Historic Environment is to provide a comprehensive review of historic environmental resources.

5.2.3 HSC correspondence with REA aims and objectives

The structure of the HSC output, which comprises a GIS characterisation and a multimedia output, with text descriptions of each Character Type, corresponds well with providing a first stage assessment of the broad activities and key feature dominating the marine and coastal environments. It meets the key aims and objectives of the REA process by:

1. Providing a firm basis for making a first stage assessment of the character of human cultural and historic activity within an REA area.
2. Meeting the REA requirements to assess activities and resources on a regional scale
3. Enables the area-based consideration of landscape and seascape character in the assessment process, interoperable with consideration of other environmental aspects
4. Providing a resource for identifying available data sources required for making more detailed assessments of potential impacts of activities within REA areas
5. Provides context for understanding other, predominantly point-based, data sources relating to the historic environment which also feed into the assessment
6. Provides context for making preliminary assessments of the need for further research and data gathering
7. Provides a valuable teaching resource capable of standing alone or contribution to other aggregate industry outreach programmes

In providing an area-based assessment of human activity and the cultural resource on a regional scale, HSC will benefit the REA process as one of the key sources of information proposed in the REA guidance document to inform a comprehensive review of a broad range of activities including industrial activity, fishing, and leisure.

HSC highlights dominant physical features such as the recurring presence of infrastructure, concentrations in wrecks and obstructions, mapped palaeo-environmental features such as palaeo-channels (where data is available) and describes their roles in relation to specific human activities. The HSC output provides valuable contextual information on a regional scale which can inform work with relevant regulatory authorities in the navigational and recreational sectors.

There is considerable scope for HSC to inform the assessment of potential impacts on an area's historic character. The characterisation provides an indication of the presence of all human activities which add to the character of a marine or coastal area.

Providing Context

The primary aim of REA is to provide an assessment of resources and impacts on a regional scale. Providing an insight into how an activity fits into a national and regional context allows a broader perspective during site specific assessments for individual license areas. Coverage by HSC will be expanded by English Heritage eventually to

produce a full national dataset, allowing all REA areas in English waters to be assessed at a strategic level.

HSC GIS output provides a strategic level characterisation of the cultural dimension of the coast and the marine zone. In the structure of the HSC GIS, its character type hierarchy reflects national, regional and local scales of perception and its tiers: sea surface, water column, sea floor, sub-sea floor, reflecting the main levels of the marine environment. This provides an approach which allows the user to select the scale and level of data relevant to their queries. Confidence ratings allow gaps in information to be identified, providing opportunity for solutions to be found before EIAs are underway.

Character Type text descriptions support the GIS by providing context on specific types of historic character at both a regional and national context. The levels of information provided in the texts/multimedia resource give the user a feel for where different activities are concentrated, provides historical context to many of the activities and therefore a better understanding of why patterns in different human activities may exist. The structure of the text descriptions for the HSC database provides a succinct overview of the character and significance of different activities when reviewing cultural and historical human processes.

The HSC text descriptions provide not only a greater understanding of historic character, in a form readily comprehensible by other professionals, but also provide an understanding of time-depth, necessary to providing a temporal context for dominant activities within the REA area.

The GIS provides immediate access to a spatial representation of the extent and coverage of different human activity. The correspondence of the HSC characterisation with the main layers of the marine environment provides clarity when considering a broad range of marine data.

The REA process provide a structure for making broad scale assessments in order to provide a first look at potential issues and activities to be aware of and to provide a context for assessing individual license areas during the EIA phase of marine planning.

The EIA process requires the collation of a broad range of documentary and digital resources to provide baseline information for making an informed assessment. The initial compilation of this data can obscure obvious trends in data. HSC will provide a valuable resource for providing cultural context for EIA assessments.

Incorporating HSC Character Assessments into REA

Archaeological assessments tend to comprise an assessment of the archaeological features recorded within a prospecting area, followed by an assessment of significance, potential impacts and proposed mitigative approaches to dealing with potential risk to the historic environment.

The approach to REA and SEA for discussing maritime archaeology has traditionally been focussed on point data, collating wrecks, obstructions and reported losses from different repositories including the NMR and UKHO databases.

Access to an HSC database would provide a basis for making statements of impact on broader historic character of marine environment at different levels of the marine environment (sea surface, water column, etc), supplementing and contextualising the coverage of individual features. This is becoming part of the responsibility of government agencies at different levels (English Nature, English Heritage) under the Marine and Coastal Access Bill (Pers. Comm. M. Quigley). More specifically, incorporating such character statements drawn from HSC will give the REA direct relevance to the requirement stated in the Bill as currently amended (July 2009) that historic and

archaeological characteristics should be considered in the identification of Marine Plan areas and in the preparation and review of Marine Plans.

The Eastern English Channel REA (Posford Haskoning, 2002) focussed primarily on considering the marine environment offshore as the licensing areas reviewed all fell within that area. HSC highlights the seamless relationships between land and sea. The extent and scale of human activities offshore are often linked to the adjacent coastal areas, the activities which characterise them and the resources they offer.

The availability of HSC should highlight the need for greater association to be made between the marine environment and the coast during environmental assessments. This approach may provide further insight during the assessment of potential impacts.

Data Management

One of the purposes of REA is to provide the first step to identifying many of the key sources required for higher resolution assessments. The HSC GIS, constructed using a very broad range of sources, accords well with that initial strategic level overview, identifying many of the human activities which characterise the marine environment assessed during REA and EIA.

The Seascapes database contains references to a broad range of digital sources which can point the user towards data sources (Meeting objective ii, Cefas, 2007) which are specific to a region or local area and may not be available through standard marine, environmental or heritage data repositories. The multimedia resource provides additional documentary source information used to produce the text descriptions which describe different Character Types.

For instance, the HSC GIS from the *Demonstrating the Method* project contains a representation of commercial shipping routes drawn from a model derived from recently gathered AIS data. Additional sources including Anatec shipping density data and historic shipping routes were taken into consideration during the characterisation of shipping routes, providing a unique overview of where large scale shipping concentrates as well as the sources used to define them.
This HSC data would be useful used in combination with the additional sources used during the Eastern English Channel REA (charted navigational channels, information from the Channel navigation information services and the Met Office Marine Consultancy Service) to highlight the main busy traffic routes within the region, providing a basis for meeting requirements for assessing collision risks under the Regulations for Preventing Collision at Sea, 1972 (ColRegs). (IMO, 1972). The HSC assessment would also provide context for EIA.

Most sources used are spatial datasets delivered in a digital format. The sub-division of the characterisation into marine tiers facilitates the identification of data required for higher resolution assessment of activities, resources and potential impacts on different tiers of the marine environment: the data required to manage risk for activities on the sea surface will inevitably differ from those relevant to the seabed.

"*REA should be able to propose targeted data collection programmes capable of filling gaps in knowledge at a regional and/or site specific level*." (p.17) HSC can do this through attribute queries of sources used in the characterisation process to identify areas where some types of data, such as palaeo-environmental models, are recorded as unavailable or offer only low confidence rating for the character assessment based on them.

5.2.4 Meeting other Aggregate Industry Requirements

Supporting ALSF Research

The Aggregate Levy Sustainability Fund (ALSF) was established in 2002 using revenue from the aggregates levy to invest in research associated with aggregate extraction to improve understanding and therefore mitigation against potential impacts of aggregate extraction on the environmental and cultural landscape. In respect of marine aggregates extraction, the industry invests considerable resources, via the British Marine Aggregate Producers Association (BMAPA) toward educating stakeholders on the mitigative activities invested in by the industry.

Outreach and Education

The aggregates industry invests considerably in a programme of education and outreach, on the one hand educating the public on the activities of the marine aggregate industry, and on the other, educating staff within the industry on how to integrate on-site heritage and environmental practices. It does this via projects such as the Awareness Programme supporting the Protocol for Reporting Finds of Archaeological Interest (Wessex Archaeology, 2005) which seeks to encourage staff in the marine aggregates industry to report finds made in the course of dredging in order to mitigate the effect of marine aggregate dredging on the historic environment (Wessex Archaeology, 2006).

The HSC multimedia output would provide a valuable resource for raising stakeholder awareness of the historic and cultural character of the landscape in which the dredgers are active, providing context for the finds being reported through the Protocol and enhancing the training for aggregates industry staff and stakeholders in the likely nature of artefacts to be found in any given area.

Applying HSC to EIA and SEA

HSC can benefit the aggregates industry during the EIA screening process. Used in conjunction with other baseline data, it can to provide a rapid preview of the historic Character Types in areas to be impacted by a given proposal. Sensitivity modelling of those Character Types' vulnerabilities to dredging scenarios will enable explicit estimation of the historic environment issues to be generated by such a proposal.

For example, to contextualise the REA case-study, the aggregate license application areas 466/1, 485 A and 485 B (in prospecting area 485) were reviewed using this project's HSC GIS to assess how the data could be used. The assessment of each tier of the characterisation in the vicinity of the license areas highlighted the following cultural processes which should be taken into account during both an REA assessment and which would warrant further investigation during the EIA process:

Sea Surface: Both areas were found to be in proximity of heavy shipping traffic areas, particularly those in area 485. Area 466, less proximal to heavy shipping routes lies between two leisure sailing routes mapped by the RYA. In addition HSC indicates a broad range of current fishing activity, particularly trawling and netting. Historically, the area has been popular with longlining, one of the more sustainable modes of exploitation for some fish species.

Water Column: Area 485 lies within a submarine practice area which dominates the character of the water column within its area. An area characterised by a dangerous wreck and a hydrocarbon installation both lay within the prospecting area. Area 466 overlaps with an extensive area characterised by obstructions which may affect dredging

gear. Further more detailed information should be sought on the nature and extent of obstructions within these areas. Historically, the area has been popular with longlining.

Sea floor: As well as overlapping with an obstruction scatter, area 466 is truncated by submarine area running NE-SW. Both areas lie in an area which has been densely prospected for oil and gas since the 1960s and are cut by hydrocarbon pipelines. Area 485 lies across hydrocarbon gas field "ESMOND". Both areas are also popular with demersal trawlers.

Sub-sea floor: Both license areas lie in vicinity of the Dogger Bank area and are known to have been exposed land-surface during at least the earliest Mesolithic period, with a high potential for traces of human activity from that period. The area is also known to be popular with commercial trawlers, which may have caused considerable impact on surviving Mesolithic submerged land-surfaces.

The example above highlights how HSC could be used in assessing the cumulative impact of aggregate extraction and other activities on the historic environment. There is potential for the use of HSC to bring about improvements in the cumulative assessments of the historic environment during EIA (Pers. Comm. E. Stalter)

Under the EU Strategic Environmental Assessment Directive (2001/42/EC), the responsibility for undertaking Strategic Environmental Assessment lies with the Government regulator, not with the developer, and is similar to that of REA. Although mineral extraction is taken account of during the SEA process, its assessment is integrated within other themes such "Existing Activities" which also covers all offshore industrial activity as well as shipping, telecommunications and wrecks. However, similar benefits would apply to the use of HSC for meeting SEA requirements. SEA is a process of predicting and evaluating the environmental implications of a policy, plan or programme at a strategic level in order to:

- support sustainable development;
- improve the evidence base for strategic decisions;
- facilitate and respond to consultation with stakeholders;
- Streamline other processes such as Environmental Impact Assessments of individual development projects.

5.3 Case-Study 2 – AONB & EMS Management Plan

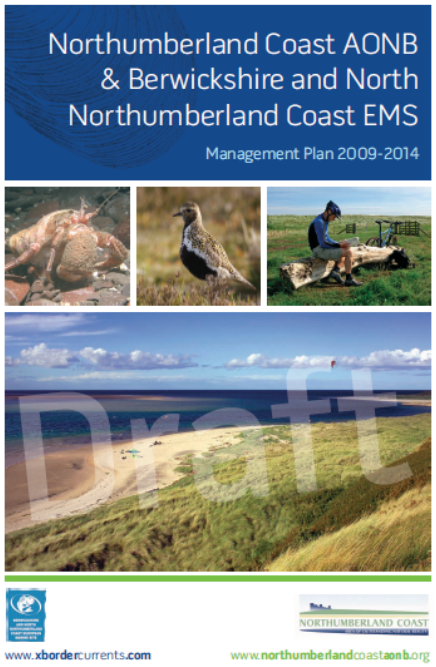
5.3.1 Introduction

Case-study 2 looks at the benefits of HSC in informing the Management Plan for the Northumberland Coast Area of Outstanding Natural Beauty (AONB) and the Berwickshire and North Northumberland Coast European Marine Site (EMS). The Plan is a first attempt at integrating the management of two designations to achieve ICZM and guide conservation and enhancement of the sites (Lannin, 2009, in draft).

It was necessary by law to carry out a concurrent Strategic Environmental Assessment (SEA) as required under the SEA Directive (2001/42/EC). A Habitats Regulations Appropriate Assessment and a Sustainability appraisal were also carried out to further support the policies in the plan.

Characterisation of the marine and coastal environment plays a key role in the development of management plans for the AONB and EMS. Management of the AONB has been and continues to be based on a landscape approach as this is affective and holistic. To improve management of the EMS a Seascape character assessment has been advocated so this project would greatly contribute to this aim.

"I would also like to say that a visual representation is so much more effective at getting a message across and this has been very hard for those of us trying to raise awareness of the underwater world! Having a HSC to illustrate the three dimensional picture of the underwater world is very powerful. "(Pers. Comm. A. Lannin, 2009)



5.3.2 Aims of the Plan

The aim of the Plan is to conserve and enhance the landscape, seascape and historic environment of the AONB and to ensure the favourable condition of the qualifying features of the EMS. The Plan will achieve this aim through management and implementation of policies and actions that protect the area using the ecosystem approach and informed conservation.

The Plan takes into account a broad range of statutory and non-statutory plans, strategies and policies at international, national, regional and local level, including the original EMS and AONB management plans, the Countryside and Rights of Way Act 2000 (CRoW Act), shoreline and estuary management plans and planning policy statements.

In addition the plan anticipates the requirements of the UK Marine and coastal access Bill and Scottish Marine Bill. The Northumberland Heritage Coast (HC) also overlaps the AONB and EMS. Many of the objectives of the Heritage Coast (HC) are synonymous with those of the AONB and EMS and implementation of this Plan will provide protection for much of the HC area.

The Plan looks at threats and opportunities for the conservation of the character of landscapes and seascapes, defining areas where changes need to be assessed and managed. Some of the challenges assessed include pressure from ecosystem and historic environment degradation and disruption, recreation/tourism, urban development, industrial development, renewables, coastal access and climate change.

The long-term management aims of the Plan for the Historic Environment:
1. Improve the identification, conservation, understanding of, and physical and intellectual access to the historic environment without damage to its integrity.
2. Increase community involvement and enhance the skills base in all stages of identifying and conserving the historic environment.
3. Influence regional policy and strategy by developing an interdisciplinary approach to understanding the historic character of the AONB landscape.

The key issues relating to conserving and enhancing the historic environment include:

- an integrated landscape/seascape-scale approach to conserving and enhancing the historic environment;
- conservation of conservation areas, designated locally listed and non-designated buildings and assets and areas of historical and architectural interest;
- natural processes of erosion and deposition;
- marine archaeology;
- preserving written, oral and illustrated history'
- Climate change and its consequences, and
- Skills development and training.

5.3.3 HSC Relevance

The plan recognises the intrinsic relationship between environment and heritage, and the role of human activity and occupation in the landscape when defining the character of an area. (Plan, p.36)

HLC was developed as a joint project between Northumberland County Council, Northumberland National Park, English Heritage and the AONB, and was found to be invaluable in gaining a better understanding of the human activities which shape the landscape. (p.36)

"The EMS would benefit from a similar detailed historic seascape character assessment to complement the historic landscape character assessment completed for the AONB." (p. 40)

Heritage Management

Policy H1

Inform conservation of the historic environment through historic landscape and seascape character assessments.

- *HSC, in the same manner as already demonstrated through the use of HLC, would provide valuable context in informing the sustainable conservation of the historic environment*

Policy H2
Extend surveying and recording of the historic environment within the Plan area to ensure information is available to support its conservation, particularly currently unidentified, under-recorded or undesignated features.

- *HSC will provide a context for understanding HER and NMR point-data during the prioritisation of sites requiring conservation and enhancement.*

- *There are a wide range of buildings associated with the farming and fishing industry and other human activities, which, although not listed as being of historic or architectural importance, are nevertheless of importance to local character. HSC (and HLC) has identified some of these sites where they have had a broader impact on their surrounding landscape (e.g. lighthouses, fish markets or fortifications). HLC and HSC provide a firm contextual framework in which understand sites, buildings and other elements in their relationship to broader landscape character, with particular relevance to*
  - *identifying and mapping such sites and buildings;*
  - *stimulating research, conservation and recording; and*
  - *Guiding the development of new appropriate uses for redundant structures... Plan p.40*

Policy H7
Develop a mechanism to address the identification and monitoring of historic sites impacted upon by coastal and marine environmental change without impacting on the qualifying features of international sites.

- *HLC and HSC could be used to broaden the perspective and comment on the wider landscape character potentially impacted by coastal change and then government strategies for mitigation.*

Policy H8
Promote understanding, conservation, monitoring and designation of marine archaeology both on and off shore while protecting the special and qualifying features.

- *HSC could help in promoting understanding of marine archaeology and historic heritage which has, to date, been omitted from this policy but which would be desirable. (Pers. Comm. A Lannin).*

Policy H10
Promote management of historic sites to avoid, remedy or mitigate the adverse effects of climate change.

- *HSC takes account of sea defences, land reclamation and semi-natural environments as well as reflecting time depth during the characterisation process. Used in combination with historical data and up-to-date surveys of coastal change, this will provide a good framework in which to identify those historic sites which may be under threat from coastal processes and or climate change. HSC and HLC provide a valuable framework for targeting conservation management in another sense too: they bring landscape character firmly into the realm of management for sustainability. They provide a measure of the extent of landscape legibility we have inherited, so enabling us to be conscious of that legibility we hand on to future generations by our actions: a principle of landscape sustainability that lies at the heart of the European Landscape Convention.*

Policy H11
Promote training and mentoring of professionals and volunteers in skills necessary for the description, recording and conservation management of the historic environment.

- HSC, especially its accompanying multimedia resource, offers a valuable educational tool for professionals and volunteers, providing a broader understanding of the historic character of their area in user-friendly, jargon-free terms. That understanding extends to adding context to their own work: how the skills and features they learn about and their work undertaken for conservation management add yet further to man's cumulative impacts that have shaped the landscape character of their area.

Environmental Quality

Policy EQ3
Ensure the environmental and aesthetic sensitivities of the AONB and EMS are taken into account in pollution emergency planning and use of the marine environment.

- *The characterisation of human activities which may have an impact on the environment such as recreational boat use can help educational programmes designed to improve environmental quality under the Clean Neighbourhoods and Environment Act 2005, for example targeting the education of commercial and recreational watercraft users with the aim of reducing the number of small scale pollution incidents. In broader terms, the area-basis of HSC and HLC understanding already accords with informing the GIS basis of most Green Infrastructure (GI) planning designed to ensure such uses are available and in harmony with other considerations including minimising pollution risk.*

Policy EQ5
Ensure standards for litter collection from streets and open land with public access are met and that adequate facilitates exist for the collection of waste form marine vessels and where possible enhance standards for the area.

- *HSC could be used as a basis for building sensitivity models relating to marine litter impacts on our underwater cultural heritage. (pers comm. A Lannin)*

Policy EQ10

Seek to increase the provision of recycling facilities, where they do not impact on the landscape.

- *HSC and HLC, used in conjunction with Landscape Character Assessment, will enable this policy's necessary understanding of landscape impact. Sensitivity-modelling of HSC/HLC Character Types' vulnerabilities to this scenario will allow identification those Types more resilient to the provision of such facilities and their design considerations, both of the facilities themselves and their siting, to reduce what are perceived as negative impacts.*

Enjoying the AONB and EMS

Policy EN1
Assess impact of recreational activities on the identified special features of the landscape including sensitive habitats, species, historic features and characteristic views and reduce the impact through targeted visitor management programmes.

- *HSC, in conjunction with HLC, provides an indication of the nature and extent of existing recreational activities both on land and at sea as well as reflecting which*

marine area (coastal, intertidal, inshore, offshore) or marine levels (sea surface, water column, sea floor, sub sea floor) could be potentially impacted. In identifying the typical and commonplace in landscape character, HSC and HLC also enable a clearly justifiable, fully contextualised statement of what is special within the landscape and why.

Policy EN3
Support the implementation of coastal access to ensure that the proposed route does not adversely affect the special and qualifying features, the historic environment or have significant impacts on the management needs of other habitats and species.

- *HSC will be beneficial in identifying routes which will optimise both the ecological and cultural benefits of coastal access, and avoid sensitivities for both, by its inter-operable use with GIS-based habitat and species distribution mapping and many other environmental map-based datasets. In support of that it will also provide the information necessary for positive steers to access-route users, using information boards and the like to direct users towards less sensitive yet informative locations.*

- *HSC can also be used to contextualise and highlight sensitive or, alternatively, informative and robust cultural features which should be taken into account during the design of coastal routes, or where specific issues may need to be taken into account, such as a limited extents of rough ground to safely locate a coastal path.*

Policy EN6
Encourage improvement in the landscape and wildlife benefits of existing caravan, chalet and camping sites and golf courses.

- Modelling of HSC/HLC Character Types' vulnerabilities to this scenario will allow identification of design aspects of the facilities and their site landscaping which will reduce what are often perceived of as negative impacts. That will enable the sites to continue accommodating visitors who can enjoy the area's landscape and wildlife with minimal impact upon them. Furthering that policy's aims too, the information contained within HSC will be available to enhance the quality of landscape information provided at these sites.

- *"Many of these occupy widely visible coastal locations. In recent years, advice has been provided to some caravan site owners to develop landscaping schemes to reduce the visual impact of their* site. *This work could usefully be extended to offer advice on developing environment and landscape plans to all caravan sites and golf courses." (p. 54)*

Policy EN8
In partnership with tourism agencies and providers develop and promote sustainable special interest tourism products ensuring that there is no negative impact on the special and qualifying features.

- *Diving is one of the special interest products that tourism agencies are keen to develop. The HSC could be used to demonstrate the historic character of the marine environment and ensure promotion of this type of tourism is responsible (giving the right messages about diving in a culturally rich environment) and also the attractions of diving where there is so much to learn and connect with in terms of heritage.*

Policy EN9
EN9 Encourage schemes that promote, or provide facilities for visiting craft and water-borne tourists where this can be achieved without impacting on the character, special and qualifying features or quiet enjoyment of the area.

- *As noted previously for other current and prospective contexts, HSC will enable sensitivity-modelling for this scenario to inform the appropriate siting and design of facilities and also raise awareness about an area's historic character with recreational users*

Living and working

One of main long-term management aims is to *"Increase awareness of the existence and purpose of the AONB and EMS designations amongst all local residents and businesses, in order to increase commitment to the conservation and enhancement of the coastal landscape."(p. 57)*

- *HSC can be used as a tool for increasing local awareness of the rich and varied historic character of these designated areas. But beyond that, it can give context and justification to the designations themselves, demonstrating and communicating what is so different and special about their combinations of cultural characteristics. HSC is especially well-placed to do this for this AONB and EMS as it enables, in conjunction with HLC, a common framework of understanding from land, across the coast to the marine. And in doing so, it also encompassing the overlaps in seaward and landward perceptions.*

Policy LW1
Identify and promote the socio-economic value of the natural and historic environment, landscape, seascape and the AONB and EMS designations.

- *HSC will form part of the evidence for implementation of this policy. HSC Character Type texts will provide a user-friendly understanding of the impact of historic cultural activity on the area's landscape/seascape, the distinctiveness that arises from that, and the amenity and educational opportunities that produces. The texts upon which the multimedia resource is based play an important role in this context, providing a basis for informing other professional perspectives.*

Policy LW5
Encourage the promotion and development of volunteering, training and education opportunities for the population of the AONB, in particular those that can contribute to better management and enhancement of the AONB and EMS.

- *HSC provides a valuable educational tool for raising awareness of local character features and providing people with a better understanding of their area's cultural character at various scales. With their complete coverage, HSC and HLC are inclusive: their narratives are directly relevant to everyone living within their areas: their homes and backyards are part of the story. That connectivity with people is further enhanced by the focus of both HLC and HSC on time-depth in the present landscape: the landscape that is most familiar to people, and through the accompanying multimedia images and texts which make the cultural characteristic features of an area more accessible.*

Land use and marine planning

Local authority landscape character assessments, for Alnwick (in conjunction with Castle Morpeth) and Berwick, as well as regional character assessments, are useful tools to identify and conserve the character of the broader area of coastal plain within which the AONB sits and to determine landscape capacity to absorb development.

Several Landscape Character Assessments and a Regional Character Assessment (Benson et Al, 2002) have been undertaken along the Northumberland Coast which have demonstrated the value of these assessments in identifying and conserving the character of the coastal areas and assessing the landscape's capacity to absorb development. (Plan p. 77). One of these has led to the proposal to extend the AONB to cover a narrow strip of coastal plain extending to the north and south of the AONB which lies within the North Northumberland Heritage Coast extent.

- The 2002 Landscape Character Assessment Guidance (Countryside Agency 2002) unequivocally recommends the use of HLC wherever it is available to inform Landscape Character Assessment (LCA) on the cultural character and impacts of areas under assessment. HSC, developed since the 2002 Guidance, extends those same principles of HLC across our coastal and marine zones, and is now available to perform those same roles there. For the coast, it also provides a distinct complement to HLC 'the view from land', in giving the overlapping 'view from sea'.

Policy LP9
Maintenance, development and diversification of harbours in the Plan area should be supported where it benefits the local community, accords with quiet enjoyment of the AONB and EMS, does not produce adverse effects on the special and qualifying features and enhances the historic character of the harbour area.

- Used in combination with historical records, Shoreline Management Plans and HLC, The HSC compiled by this project provides a strategic level understanding of existing historic cultural context of such harbours within the broad coastal context, appropriate for example to selecting which of several harbours may be appropriate for particular types of development. Where development of particular harbours is proposed, more detailed scale HLC and HSC characterisation will be needed to accord with the greater level of understanding required.

Policy LP 11, 12
Commercial renewable energy developments should only be permitted within the AONB in exceptional circumstances and should be avoided in areas adjacent to the AONB where development would compromise the special features of the AONB.

Commercial renewable energy developments should only be permitted within the EMS where it can be clearly demonstrated that the development will not have an adverse effect upon the integrity of the site and its qualifying features.

Policy LP13
Proposals for other renewable energy developments, including individual wave and tidal energy schemes and individual wind turbines, should be considered favourably providing they do not detract from landscape and seascape quality and character, biodiversity or the historic environment or adversely affect the local community. Individual wind turbines should be associated with existing settlements or buildings and subject to a landscape character impact assessment.

- *The role of HSC and HLC will be to inform developers on the character of the landscapes and seascapes surrounding their development during impact assessments.*

Policy LP14
Landowners should be encouraged to mitigate the impact of biofuel and biomass crops in a diversified farming landscape by taking associated measures to minimise adverse effects on landscape and seascape quality and character, biodiversity, the historic environment or local communities.

- *HSC will play a key role in supporting planning procedures surrounding the development of biomass initiatives by informing on the character of areas which may be affected by changes in the landscape. English Heritage guidance on "Biomass and the Historic Environment" (English Heritage 2007) recommends that where available an appraisal of the historic dimension of the landscape (and therefore the seascape) should be incorporated at an early stage in the overall assessment of landscape and archaeological impact.*

Policy LP15
Permission for new telecommunications masts should only be granted where the applicant can demonstrate that there is not a more suitable site and there is a genuine technical reason why existing masts cannot be shared with other operators.

- *The use of sensitivity assessment for this scenario, building on HSC and HLC, will inform decision making during the planning of such developments either at strategic or specific application level.*

Policy LP20
Minimise visual and environmental impacts of new and maintenance coastal defence work on the special and qualifying features of the interest features of designated sites.

"*...it is recognised that defences are vital in certain areas for the protection of some settlements and assets such as harbours... Where defences are upgraded or new defences developed, they should be designed to minimise their visual impact on the AONB and EMS and also minimise impacts on natural coastal processes and habitats*." (p. 85)

- *The use of sensitivity assessment for this scenario, building on HSC and HLC, will inform decision making during the planning and design of such essential developments at both strategic and specific application level, thereby ensuring that their landscape character impacts are fully understood and properly mediated with those whom they affect.*

Policy LP21
Promote managed re-alignment of the coastline and defence works where there would be a positive effect on restoration of free-functioning coastal and marine ecosystem processes while minimising, where possible, adverse effects on the historic environment.

- *HSC can provide the basis for a cultural landscape sensitivity assessment of this scenario, ensuring that ecosystem-process benefits from such works are made against a full understanding and justification of their cultural-impact implications, as is necessary for the effective operation of the ecosystem services approach. Such cultural landscape sensitivity assessment will be appropriate and capable of being informed by HSC, not only for managed realignment works themselves but*

for any consequential works they incur elsewhere too, such as habitat recreation works.

Policy LP22
Ensure that marine planning systems are integrated and complementary across the English-Scottish border and take into account the special and qualifying features.

- *By providing broader context of the typical cultural character of an area, HSC can provide clear explicit demonstration of the combination of cultural characteristics that are special within the area. What is special is relative and has meaning only within that broader context. HSC is especially well-placed to do this for the combined AONB and EMS as it enables, with HLC, a common framework of understanding from land, across the coast to the marine, encompassing the overlaps in seaward and landward perceptions. Although the English and Scottish administrations operate differing marine planning systems, the baseline information needed to inform them is common to both. While currently at different stages of development, there is much convergence in direction between the two countries over the need for providing map-based information on the historic character of the coastal and marine landscape.*

5.3.4 Conclusions

The review of the relevance of HSC to the Joint AONB and EMS Management Plan Policies has indicated a broad range of applications, not only in meeting the plan's needs with respect specifically to the historic environment but in its broader sustainability aims too, ensuring that its policies at least maintain and where possible enhance the landscape and seascape over which they have influence. HSC also provides a valuable tool for education and outreach, offering strong and immediate connectivity for the AONB's population and for users of the AONB and EMS. In that it will help meet the Plan's requirements to raise awareness of the value and diversity of local cultural landscapes with a breadth of interest groups.

5.4 Case-Study 3 – Outreach and Education

Historic Seascape Characterisation (HSC) provides an opportunity to raise the general public's awareness, understanding and appreciation of the historic dimension of the marine environment, which *"…has important implications both for the ways in which we treat the sea and for the public accountability of future marine spatial planning."* (Hooley, 2007: 11).

The following case studies provide examples of how existing networks, programmes and curricula in the study area (North East, Scottish border to Withernsea), could provide opportunities for disseminating information about HSC, why it is needed and how it is used.

A central component of England's 'Historic Seascape Characterisation' (HSC) programme is the HSC multimedia resource (see below). This has been specifically designed to provide a user-friendly web-based means for the general public to access, browse and interrogate the Character Type mapping and structured texts generated for the GIS during the characterisation phase of the programme, complemented by a range of corresponding imagery.

This multimedia resource will constitute the primary means by which the general public will access and appreciate HSC in the potential education and outreach opportunities identified below.

5.4.1 Education and Outreach for adults

HSC responds to a wide range of needs for promoting the marine and coastal historic environment through its integration with educational initiatives which seek to inform on the historic environment through training supported by user friendly resources such as the HSC multimedia output.

5.4.1.1 Promoting understanding of the resource through the Nautical Archaeology Society (NAS)

The Nautical Archaeology Society is a non-government organisation formed to further interest in underwater cultural heritage. The NAS aims to preserve archaeological heritage in the marine environment, by acting as a focus for coastal and marine archaeology. To do this the NAS aims to reach and involve divers, non-divers, scientists, historians and anyone with an interest in maritime archaeology.

The NAS runs an International Training Programme that is open to everybody with an interest in and desire to learn more about maritime archaeology. The training programme has a modular structure and a choice of specialist courses. The NAS Part III Certificate provides the major teaching element of the programme. Through lectures, demonstrations and practical exercises in many different areas of underwater archaeology the certificate aims to create a competent fieldworker who would be an asset to any project. Participants attend courses in different modules in order to build both their theoretical and practical experience. Courses are taught by specialists in their field, who are best able to provide expert advice and training. (from NAS website 27/06/09). The Part III syllabus comprises seven modules, one of which is Research and Information Technology which includes: Computer Aided Design, GIS Programmes, Social History of Ships, and Numismatics.

The HSC multimedia output would provide a useful resource for providing context and increasing awareness of the character of the marine and coastal historic environment. The GIS output of HSC would provide a suitable case study in learning the capabilities of GIS software.

The existence and benefits of the HSC resource in the North East (and other pilot areas) could be promoted through the NAS Part III Research and Information Technology module. Part III courses typically run for 1-2 days. Potential applications of HSC on the course could include the following:

- Introduction to Historic Landscape Characterisation (HLC) principles
- Demonstration and applications of the HSC multimedia resource
- GIS applications of HSC (Desk Based Assessments (DBAs) for proposed diving/project activity, area and site research, NAS Part II projects, Adopt a Wreck projects etc)
- Presentation of brief case studies showing application of HSC in various sectors

NAS Part III courses are typically very well attended and such a module may prove attractive, especially if it were offered to participants at a subsidised price.

Dissemination beyond NAS Part III course attendees could be achieved through the development of an accessible and engaging information leaflet, summarising information

about HSC and its multimedia resource, organised under the same headings as those proposed for the NAS Part III course above. In addition, this leaflet could suggest how HSC could be of use to NAS members, for example during Desk Based Assessments (DBAs) for proposed diving/project activity, area and site research, NAS Part II projects, Adopt a Wreck projects etc. The leaflet could be distributed through NAS NE's contacts network and on a national scale, via an article and/or enclosed leaflet in NAS's quarterly Newsletter.

This approach utilises an existing, dynamic network of NAS members who are actively engaged in research and activity that could be complemented and enhanced by the use of HSC.

5.4.1.2 Promoting understanding of the resource to the general public

An alternative version of the accessible and engaging information flier could be produced for the general public and made available through existing leaflet distribution points (e.g. Tourist Information offices, holiday accommodation, leisure venues, shopping centres, community centres, libraries etc.). The style and content of this leaflet would aim to appeal to and engage a diverse audience, including people who perceive that the coastal and marine zones are of little or no interest or relevance to them. The HSC multimedia resource can provide a means for such potential audiences to recognise, interact with and develop an understanding and appreciation for the coast and marine zones.

5.4.1.3 Providing an access-point through North East England Maritime Archaeology Research Archive (NEEMARA)

NEEMARA is a non-lending collection, established in 2006 by the Nautical Archaeology Society North-East (NAS NE), with grant-funding from English Heritage. It comprises a wide range of maritime reference material, from professional archaeological reports and policy documents, to general shipping books and magazines.

The archive is located within the offices of Tees Archaeology, Hartlepool. It is staffed by volunteers who make every effort to answer maritime enquiries but visits to the archive are strongly recommended, where people can undertake their own research.

The North East England Maritime Archaeology Research Archive constitutes an ideal access-point for in the North East region, where people could access, browse and interrogate the HSC multimedia resource via the ADS website. For the HSC multimedia resource to be used in conjunction with NEEMARA most effectively, NEEMARA staff working as volunteers could be offered training on Historic Seascape Characterisation. It is anticipated that this training would comprise a similar content and format to that proposed above for the NAS Part III course, with the addition of a section covering how to support first-time users of the multimedia resource. The simple and user-friendly nature of the HSC multimedia resource would be particularly appropriate in this context as NEEMARA staff have highlighted this as an essential attribute as their users often have limited technical experience and competence.

Copies of the accessible and engaging information leaflet proposed above, could also be made available at NEEMARA to promote and explain the HSC multimedia resource accessible from the archive.

5.4.1.4 Promotion of the resource through the PortCities Hartlepool website

PortCities Hartlepool is an online resource that was an output of a 2004 New Opportunities Funded project (http://portcities.hartlepool.gov.uk/). The website provides an "*...exciting and accessible learning resource which focuses on Hartlepool's important maritime history and development.*" It is organised into the following sections:

- Ships and shipping
- Owning ships
- Building ships
- Marine trades
- Wrecks and accidents
- Maritime archaeology
- Port and town
- Growth and development
- Docks and buildings
- Trade and industry
- Transport
- Councils and planning
- People
- People in Hartlepool
- Health and education
- Religion
- Sport and leisure
- Traditions and folklore
- Hartlepool at war
- World War One
- World War Two
- Local studies
- Links

The PortCities Hartlepool website is currently maintained by the reference library and at the time of writing comes under the remit of Diane Marlborough (diane.marlborough@hartlepool.gov.uk).

The HSC multimedia resource for the North East could be linked to this existing online maritime resource for the area. Links could be added to PortCities Hartlepool to take interested parties to the online HSC multimedia resource made publicly available via the ADS website. Coupled with a well-planned programme of promotional activity (for both the PortCities website and the HSC multimedia resource), this could be an extremely resource-effective method broadening the dissemination of information about HSC and improving public access to information about the area's maritime cultural heritage.

5.4.2 Education for children through schools

5.4.2.1 Introduction

While there is no specific curriculum requirement to study HSC, the subject is particularly appropriate to a cross-curriculum approach, which is highly valued within the new National Secondary Curriculum. From September 2009, the new curriculum will apply to all year 7 and year 8 pupils, and from September 2010 it will apply across years 7, 8 and 9. Changes to the key stage 4 curriculum begin rolling out in September 2009.

The HSC multimedia resource should be of particular interest to secondary schools. The user-interface is clear and simple to use. From a clickable map and text-list, the user is able to access information about the marine zone, in relation to specific Character Types

that have been identified for geographical areas. The Character Types are defined in terms of aspects such as use (mineral extraction, energy industry, fishery, mariculture, ports/docks/harbours, recreation, transport, settlement etc.), features (navigational buoys, maritime safety, military facility etc.) and environment (dunes, foreshore, sand & mudflats, navigational hazards etc.).

Each Character Type comprises information under the following headings:

- INTRODUCTION: DEFINING/DISTINGUISHING ATTRIBUTES
- HISTORICAL PROCESSES; COMPONENTS, FEATURES AND VARIABILITY
- VALUES AND PERCEPTIONS
- RESEARCH, AMENITY AND EDUCATION
- CONDITION AND FORCES FOR CHANGE
- RARITY AND VULNERABILITY

The user has the option to view the information under the headings listed above from the national perspective or the regional perspective.

The HSC approach recognises that landscape is both culturally produced and culturally perceived by present populations and embodies varying rates and degrees of change (Hooley, in press). It therefore provides an ideal focal point around which cross-curricular themes can be explored including environment, cultural identity, human impact on the environment and sustainability.

The HSC multimedia component provides an online resource that can be used to explore such themes while researching local seascape perceptions within school, in an extended-school or out-of-school context.

Constraints relating to time and resources within schools suggest that they are unlikely to adopt new resources and approaches unless they can clearly be shown to relate to the National Curriculum. Adoption potential can be greatly enhanced by linking directly to statutory requirements for particular subjects. *'The National Curriculum Statutory requirements for key stages 3 and 4'* (DfCSF & QCA, 2007) have therefore been explored in relation to HSC and particularly relevant links identified as follows:

5.4.2.2 History in the National Curriculum (Key stages 3 and 4)

The History National Curriculum states that pupils should:

"Explore the ways in which the past has helped shape identities, shared cultures, values and attitudes today: This includes: exploring the relationship between the past and the present and understanding that ideas, values and beliefs stem from a process of continuous change and interaction" (DfCSF & QCA, 2007: 117).

This inter-connectedness and cross-pollination between past and present, culture, beliefs and environment, is central to HSC principles and approach. The multimedia resource provides a powerful real-world model for viewing, interrogating and developing an understanding of these relationships described within the Character Type context.

5.4.2.3 Citizenship in the National Curriculum (Key stages 3 and 4)

The National Curriculum states that the study of citizenship should include: *"……Actions that individuals, groups and organisations can take to influence decisions affecting communities and the environment……Environment: This provides opportunities to evaluate individual and collective actions that contribute to sustainable practices. Pupils*

could consider the different ethical implications of actions, policies and behaviour. This work can be linked with work in science and geography." (DfCSF & QCA, 2007: 32).

Again, the HSC principles and approach are particularly appropriate in this context and the multimedia resource could be used as a focus for cross-curricular work looking at the inter-relationships between people, culture, environment and sustainability.

5.4.2.4 ICT in the National Curriculum (Key stages 3 and 4)

The ICT National Curriculum states that pupils should:

"Use ICT to research information about the past, process historical data, and select, categorise, organise and present their findings: This includes: evaluating websites, considering the provenance of materials and assessing their value; and using ICT to process historical data and to select, categorise, organise and present information." (DfCSF & QCA, 2007: 117).

ICT in the National Curriculum: statutory requirements for key stages 3 and 4
The Key concepts of the ICT curriculum are:

- Capability
- Communication and collaboration
- Exploring ideas and manipulating information
- Impact of technology
- Critical evaluation

Within which pupils are required to use *"a range of ICT tools in a purposeful way to tackle questions, solve problems and create ideas and solutions of value."*, explore *"the ways that ICT can be used to communicate, collaborate and share ideas on a global scale, allowing people to work together in new ways and changing the way in which knowledge is created."*, *"Manipulating information and processing large quantities of data efficiently."* and *"transforming data from numeric table to graphical interpretation"*. (DfCSF & QCA, 2007: 122-124).

Curriculum opportunities identified in the ICT curriculum include: *"Real-world situations: This could include case studies based on or drawn from examples outside the school environment (e.g. information systems used in the local community)."* (DfCSF & QCA, 2007: 127).

The HSC multimedia resource provides just such a real-world case study, external to the school environment. It provides an example of how ICT can be used to effectively and efficiently communicate information and enables users to experiment with viewing and interrogating the information source. As such it provides a valuable resource for teaching ICT within schools.

5.4.2.5 Geography in the National Curriculum (Key stages 3 and 4)

Geography *"helps young people make sense of a complex and dynamically changing world. It explains…how places and landscapes are formed, how people and their environment interact and how a diverse range of economies, societies and environments are interconnected…fieldwork is an essential element of this. Pupils learn to think spatially and use maps, visual images and new technologies, including geographical information systems (GIS), to obtain, present and analyse information. Geography inspires pupils to become global citizens by exploring their own place in the world, their values and their responsibilities to other people, to the environment and to the sustainability of the planet."* (DfCSF & QCA, 2007: 101).

HSC provides a real-world example encompassing the majority of these elements. The HSC approach recognises diversity and the complex relationships and interconnectedness between people, time and environment. It helps people understand *"…the time-depth and character of human cultural processes that have shaped our present environment and its ecosystems"* (Hooley, in Press). In addition, the multimedia resource provides an opportunity for 'remote fieldwork' and development of skills such as information management and spatial analysis.

In addition to promoting the subject specific and cross-dimensional relevance of HSC's approach and content to the Secondary National Curriculum (see above) emphasising HSC's use of GIS, could further enhance the appeal and potential uptake from schools. GIS is explicitly referred to under a number of subjects in the new National Secondary Curriculum and there are many difficulties in fulfilling statutory requirements to incorporate it into the UK classroom (see below).

The importance of using GIS in the geography curriculum is highlighted in the following explanatory notes:

"Information should be gathered from a variety of sources, including fieldwork libraries, the internet and digital media, official agencies, GIS and newspapers.

Fieldwork tools: These include using ICT, such as digital and video cameras, GIS, and environmental sensors (eg data-logging weather stations).

Geographical data: This includes published statistics, data gathered from fieldwork, literature, biographies, travel writing and information generated by GIS." (DfCSF & QCA, 2007: 104-105).

In addition, GIS is highlighted as a Curriculum Opportunity (opportunities that are integral to learning and enhance learners' engagement with the subject): *"Geographical information systems: These are valuable for mapping and visualising information, as well as linking and analysing different spatial datasets. Pupils should have opportunities to learn about GIS."* (DfCSF & QCA, 2007: 107).

HSC could provide a valuable case-study showing GIS in action and how it is used for mapping, visualising information, linking and analysing datasets. The multimedia resource provides a 'fieldwork tool' with which users can view and interrogate the geographical data. Internet enabled ICT suites will be able to access this resource remotely, without the need for additional resources or software.

In her article 'the entire World's a Classroom' in The Independent's Education section, Virginia Matthews recognises:

"With teachers keen to raise the somewhat dry profile of geography and to take advantage of the current interest in issues such as climate change, the advantages of a classroom toolkit that brings to life anything from general election mapping to routine sea defences work are clear. ICT tools, says David Mitchell, consultant to the Geography Association, are "transforming how children are taught to understand the world around them and helping them develop more sophisticated problem-solving and enquiry skills"." (Matthews, 2005).

HSC's multimedia resource provides an ICT tool, remotely accessible via the internet, that can be readily utilised within the classroom and beyond. It constitutes 'remote' access to coast and marine zones, providing layers of information about the cultural and physical landscape and people's perceptions of it.

The cross-curriculum appeal of such an approach is also recognised:

"…a better understanding of digital mapping and its application to real-life issues such as transport and the environment can give children a leg-up in a whole range of other subjects - among them, citizenship and many different branches of maths and science" (Matthews, 2005).

While the new secondary school National Curriculum statutory requirements encourage the use of GIS *"Research suggests that the complexity of GIS software can be a barrier to usage in the classroom….. In interviews with my own colleagues [secondary school teachers] a common reason for not developing their own use of GIS was that they were not confident in using it."* (Biebrach, 2007: 7).

Another barrier to using GIS in secondary schools has been identified by Fargher: *"Lack of user-friendly GIS data remains a real barrier for many. The search for appropriate data can be daunting for the un-initiated."* (Fargher, 2006: 3).

The clear, simple, user-friendly interface of the HSC multimedia resource means that schools can offer pupils opportunities to view and interrogate data created with GIS tools. It could help address the barriers to using GIS in the classroom identified above, by providing what Fargher refers to as a: *"start simple approach to getting GIS into UK classrooms"* (Fargher, 2006: 5).

To facilitate the above, an awareness programme to promote the HSC multimedia resource amongst secondary schools and education authorities in the North East is proposed. The promotion material would include specific reference to the National Curriculum's subject-specific and cross-curricular links. For example:

5.4.2.6 Conclusions

The HSC approach and content provides a suitable tool for education in schools as it:

- Demonstrates a real-world cross-curricular approach
- Shows how the past has helped shape the present (History KS3 & 4)
- Highlights links between culture, environment and sustainability (Citizenship KS3 & 4, Geography KS3 & 4)
- Provides an ideal focal point around which cross-curricular themes can be explored (e.g. environment, cultural identity, human impact, sustainability etc.)

The HSC multimedia resource and GIS output provide:

- A real-world example of how ICT can be used to effectively and efficiently communicate information (ICT KS3 & 4)
- A real-world example of GIS in action (Geography KS3 & 4, ICT KS3 & 4)
- Information about social and environmental pressures on coastal environments in the North East (Geography KS3 & 4, Citizenship KS3 & 4)
- Information about how GIS is used as a tool to aid planning and management (Geography KS3 & 4, Citizenship KS3 & 4, ICT KS3 & 4)

The scale and accessibility of HSC GIS and multimedia resources provide a valuable set of tools for enhancing the appreciation and understanding of the character of the coastal and marine historical and cultural environment children of all ages live in, proving particularly suitable for use in the context of secondary education.

6. Conclusions

The Application Review is designed to identify and demonstrate the capabilities of Historic Seascape Characterisation and its potential for application to a range of planning and outreach scenarios. The review seeks to illustrate how HSC can enable the historic character of our present coastal and marine seascapes to play its full part in shaping culturally distinctive and legible seascapes for the future, using a series of case-studies to support the discussion.

The review of HSC applications has demonstrated the value of HSC in a broad range of contexts through a review of the potential applications of HSC on a broad scale, taking account of current policies and legislation, government priorities and the needs of stakeholders in the marine and historic environment. The review was then illustrated through a series of case-studies which applied HSC to a range of scenarios.

In order to contextualise the discussion, the review considered the relevance of HSC to a range of national and international government contexts including UK Legislation, marine planning infrastructure and the responsibilities of English Heritage, EU Marine Policy and the European Landscape Convention, and the impacts of climate change on the historic environment and our perceived landscape.

The Review promotes the applications of HSC in delivering baseline information on a regional scale, providing valuable context and promoting the principles of historic characterisation in informing sustainable management of change, spatial planning, research planning and outreach.

The Application Review clearly demonstrates the value of HSC in meeting the user needs of English Heritage while adhering to data standards implied through the Draft Marine and Coastal Access Bill (Defra 2008) by:

- Documenting the relationships between historic and natural environmental character
- Contextualising and enhancing the application of the National Monument Record, Historic Environment Records and Maritime Record
- Informing and contextualising the development and updating of Rapid Coastal Zone Assessments
- Stimulating further research relating to the coastal and marine historic environment
- Improving awareness, understanding and appreciation of the marine historic environment

The case-studies selected demonstrated the potential of HSC in contributing to:

- Increasing awareness of the coastal and marine resource, by adding an area-based dimension to the assessment of archaeological and historic themes and features within our landscape and seascape;
- Informing desk-based assessment for development-led and strategic assessments such as EIA, SEA and REA;
- Informing management of the marine and coastal environment through cross-disciplinary applications of HSC
- Outreach and engagement with the wider public through adult and school education and other awareness-raising intiatives

HSC's comprehensive GIS presentation of historic character and the provision of a user-friendly accessible multimedia resource, provide routes by which the historic environment will play a valuable role in planning for sustainable, culturally legible and distinctive future landscapes and seascapes.

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8. Abbreviations

ADS – Archaeological Data Service

ALSF – Aggregate Levy Sustainability Fund

AMAP – Area of Maritime Archaeological Potential

BGS – British geological Survey

CRS – Co-ordinate Reference System

Defra – Department for the Environment and Rural Affairs

DNF – Digital National Framework

EH – English Heritage

EIA – Environmental Impact Assessment

ESRI – Environmental Systems Research Institute

EU – European Union

HER – Historic Environment Record

HLC – Historic Landscape Characterisation

HO – Hydrographic Office

HTML – Hyper Text Mark-up Language

HWTMA – Hampshire & Wight Trust for Maritime Archaeology

HSC – Historic Seascapes Characterisation

IACMST - Inter Agency Committee for Marine Science and Technology

INSPIRE – INfrastructure for SPatial InfoRmation in Europe

LAT – Lowest Astronomical Tide

MEDIN - Marine Environmental Data and Information Network

MEDAG - Marine Environmental Data Action Group

MDIP – Marine Data Information Partnership

MHW – Mean High Water

MLW – Mean Low Water

OS – Ordnance Survey

OSGB36 – Ordnance Survey Great Britain 1936, the geographic datum of British National Grid

UKHO – United Kingdom Hydrographic Office

RAA - Regional Archaeological Assessments

SEA – Strategic Environmental Assessment

SMR – Sites and Monuments Record