Future Seascapes

Seascape has played an important part in the history and development of England and is central to our sense of identity and culture. Our coast and seas are also a significant resource that underpins our economy, livelihoods, health and well-being. Yet, the coast and related seascape is a finite resource, a resource that is under continual pressure for development and change.

We are also facing a period of exceptional change around our coasts from the interlinking crises in climate, biodiversity and well-being, and a continual pressure for development. This ranges from development of new ports, or upgrading of existing facilities, proposals for aquaculture schemes or development of offshore renewables.

With all these pressures for change related to the coast and the sea, it is essential that the decision-making process has the tools to deal with upcoming change. Decision-making around change and development must be rooted in an understanding of our coastal landscapes and seascapes; how they function, and how they are perceived and valued by people. Understanding how seascapes can be predicted to change in the future will also help to ensure that change is sustainable, resilient and adaptable.

Marine Planning and SCA

The Marine Policy Statement, published in 2011, is the framework for preparing Marine Plans and for all decisions affecting marine and coastal areas. It provides a system of marine planning that recognises that the demand for use of our seas and the resulting pressure on them will continue to increase. It aims to manage competing demands on the marine area and enable the co-existence of compatible activities where possible, achieving integration between different objectives. The Marine Planning process seeks the integration of marine and terrestrial planning in the intertidal areas.

> The UK Government vision for the marine environment is for '*clean, healthy, safe, productive and biologically diverse oceans and seas*.'[1]

High level objectives to achieve this vision are delivered within a framework of economic, social and environmental considerations.

Background to the evolution of SCA

When seascape character assessment (SCA) became a detailed consideration within the Marine Policy Statement in 2011, Natural England's original guidance on landscape character assessment, 'Landscape Character Assessment Guidance for England and Scotland' (2002), was expanded to include SCA. The publication of 'An Approach to Seascape Character Assessment' (SCA Approach document) in 2012, established SCA as an appropriate way to assess, characterise, map and describe seascape character.

Since the publication of the SCA Approach document over a decade ago, the use of SCA has matured. The Marine Management Organisation (MMO) has published SCAs at the Marine Plan Area level for all English waters and those SCAs underpin seascape policy in England's suite of marine plans. SCAs have also been published by some Local Planning Authorities and National Landscapes, many of which are integrated with coastal or terrestrial LCAs.

Relationship with the update to the Landscape Character Assessment (LCA) Approach document.

Natural England is currently updating the 'Approach to Landscape Character Assessment' (LCA Approach document). First published over 20 years ago, and revised in 2014, the LCA Approach document provides guidance on the preparation of landscape character assessments. Stakeholders engaged as part of the preparation for the update of the LCA document identified the value in revisiting and updating the SCA Approach document. Feedback also suggested the merit in potential integration of the landscape and seascape approaches for those using both marine and terrestrial plans in decision making.

[1] Safeguarding our Seas, Defra (2011)

The SCA Approach document followed the well-established and widely used principles and stages set out in the LCA Approach document, although with a different emphasis given the particular issues that need to be considered when assessing coastal and marine environments. However, as separate guidance documents, the process of seascape and landscape assessment have subsequently diverged. One of the key aims for the update of the SCA Approach document is to examine the potential integration of LCA and SCA to form a consolidated framework for character assessment.

Since 2012, significant technical advances have been made in how environmental data is assembled and interrogated. There is also an increased focus on environmental outcomes, growing pressure on our coastal landscapes and seas arising from a range of forces for change, and new and emerging attitudes to how landscape and seascape is valued. People also now consume and apply information very differently. Therefore, it is timely for the SCA guidance to be reviewed to make it fit for the future and the challenges we face. It provides the opportunity to promote and embed the use of landscape and seascape evidence in decision-making, as an integrated marine/terrestrial spatial framework for managing change and tackling the challenges we face.

To stimulate interest among stakeholders contributing to the update of the SCA Approach document, the MMO commissioned LUC to write a scene-setting document to provide debate about our future seascapes. The paper also draws on the experience of members of the client team at the MMO and Natural England.

Challenges of the climate and biodiversity crises

> "Seascape is important for many reasons and is widely acknowledged as an essential part of a sustainable future, across the social, economic and environmental agendas and managing the process of change." **[An Approach to Seascape Character Assessment 2012]**

The global climate and biodiversity crises are having and will continue to have a fundamental impact on the future character of the coastal landscapes and seascapes of England, and their characteristic natural and cultural features.

As sea levels rise, and extreme weather events become more frequent, the impacts on our coastal landscapes and seascapes are often devastating. Both increased flooding and coastal erosion, along with efforts to reduce these climate change impacts through shoreline management and coastal defences, can lead to changes or loss of important landscape and seascape features and habitats.

Increasing rates of coastal erosion is resulting in retracting cliffs, reduced beach levels and the destabilisation of dune systems. It is also resulting in the loss of homes and businesses in coastal communities. The Environment Agency estimates that about 1,800km of open coast in England is eroding, in some places such as East Rising and Norfolk, the coast is eroding at more than 2m per year. Some 3,500 properties are in areas at risk of coastal erosion in the period up to 2055, increasing to 10,100 properties by the end of the century[2].

Low-lying coastal communities are more vulnerable to flooding from the sea, and this risk is increasing due to climate change. Some 205,000 hectares of agricultural land[3], is at risk of coastal flooding each year, while properties in coastal areas, such as Hull and Great Yarmouth on the east coast, Kent and Sussex in the south-east, and parts of Cornwall in the south-west are at risk.

As sea levels rise along the coasts, saltwater moves onto the land, particularly in low-lying areas such as the Fens. The salinisation of coastal landscapes can affect the ability of such areas to produce food[4]. It can also result in the loss or migration of valued habitats, such as coastal marshes, fens, heathland and vegetated shingle. Increased sedimentation is also damaging our intertidal habitats and resulting in changes to our estuaries and beaches. The impacts of pollution and increased salination of our rivers, is resulting in poorer seawater quality, which has impacts on the recreational and perceptual value of our seascapes.

The seascapes of England are also changing as a result of our attempts to slow and adapt to the impacts of climate change. Some responses, such as the development of renewable technologies for wind or wave energy, and the associated need for onshore grid infrastructure, introduce development in our seas and coastal landscapes that require careful planning.

Changes including the displacement of traditional industries, such as fishing, and increases in new marine activities, such as offshore renewable energy, aquaculture, port development and diversification, or the increasing reliance on aggregate extraction for terrestrial activities, also alter the marine and coastal area.

At the same time, what we value about our seas and coastal landscapes is evolving and will continue to change. For example, society sees increasing value in our seas and coasts for what they provide in terms of the ecosystem goods and services that flow from natural capital assets. These include food provision, water quality and climate regulation, and people's understanding and enjoyment of the biodiversity, geodiversity and sense of tranquillity that contribute to the varied sense of place and recreational asset that our seascapes provide.

Now is the time to think strategically about the future of our seascapes and what we want them to provide. The holistic understanding of seascape character and the effects of change on that character, offered by the SCA process means that it has a key role in helping to manage and guide change. SCAs, regardless of their scale and scope, have an important role to play in guiding positive change. Characterisation requires effective integration of information on natural processes, the historic environment and how the seascape has evolved over time, as well as an understanding of the way that it is perceived and experienced by people. The outputs of SCA can provide a baseline against which the effects of change can be judged, to help determine and analyse forces for change or

[2] Environment Agency, National Coastal Erosion Risk Map (NCERM) December 2024
[3] FCC0019 - Evidence on Coastal flooding and adaptation to climate change (
[4] University of Lincoln (2023) https://news.lincoln.ac.uk/2023/01/20/first-maps-of-the-fens-reveal-saltwater-that-could-threaten-food-production/

trends, determine mechanisms to guide positive decision-making and actions to protect, manage, plan and promote seascape character in the future. In other words, what our future seascapes need to achieve.

As a nation we do not have enough land and seas to meet all the challenges we face now and in the future. Our seascapes are a finite and precious resource that is under huge pressure from the complex and interacting demands we make of it. For example, there is an ongoing conflict between the needs of offshore wind development and the fisheries industry.

The many, often conflicting demands on our marine and coastal environment need to be considered together in decision making. This multi-functional approach needs to be reiterated in the application of SCA to ensure positive change. The process and application of SCA should have a key role in promoting integrated multi-functional approaches to change. Evidence of what people value locally and why, combined with an understanding of coastal and marine features, characteristics and processes can be used to help address the challenges we face. Guided by the SCA process, and a sound understanding of seascapes from a functional perspective (monitoring resources such individual habitats and elements of the seascape), will help ensure that these features and characteristics work together to strengthen seascape character and sense of place.

SCA as a means of guiding positive landscape/seascape change

The SCA process can provide an understanding of the existing coastal landscape and seascape, how it evolved over time and how it is perceived and valued by local people; its 'sense of place'. It also offers the opportunity to inform an understanding of how it may evolve in future and respond positively to the increasingly complex drivers of change. We need to use this understanding to ensure our future seascapes are sustainable, resilient and adaptable.

Examples of approaches to managing future change informed by an understanding of seascape through the SCA process and its application are set out below. These are some of the areas where an updated and integrated SCA/LCA Approach document has the potential to provide more detail and guidance for practitioners and users.

Addressing the climate change/biodiversity crisis through the SCA process

The impacts of climate change from sea rise and extreme weather events, such as coastal erosion, floods, and salination of coastal soils, are already changing our coastal landscapes and seascapes. In parallel, we are witnessing biodiversity loss resulting from climate change, unsustainable fishing, marine development and pollution.

There is an opportunity for the SCA process and its application to be more ambitious, aiming to optimise environmental outcomes and deliver resilient and adaptable seascapes that help sequester carbon, alleviate the impacts of climate change and address the biodiversity crisis while working to strengthen coastal and seascape character. The profound effects that climate change will have on our landscapes and seascapes over time, means that it should permeate all aspects of an SCA rather than being confined as a self-contained topic within SCAs. Examples of approaches showing how the SCA process could help are set out below.

- **Increasing climate resilience and adaptability through shoreline management decisions.** There is an opportunity for the SCA process to support more sustainable and integrated coastal and terrestrial decision making resulting in adaptive coastal management approaches that work with natural coastal processes. Shoreline management decisions should take full account of landscape/seascape and visual impacts, for example ensuring that restoration considers the intrinsic pattern and scale of the area and responds to its unique identity. The SCA process can provide a framework, working with natural processes and with the support of local communities, to strengthen seascape character for the long term.
  - **Managed coastal realignment.** Managed realignment, where coastal defences are breached to allow tidal flooding of land, is increasingly used as a sustainable, nature-based solution to changing environmental conditions. It allows for the creation of new intertidal habitats, such as salt marshes and mudflats, which act as a natural buffer against rising sea levels and storm surges and enhance the biodiversity of coastal areas. Several managed realignment projects have been implemented along the English coastline, creating new salt marshes, such as the restoration of the Steart Marshes on the Severn Estuary in Somerset where 477 ha of inter-tidal habitat was created attracting 53 species of birds.
  - **Coastal restoration or creation**. The restoration or creation of intertidal habitats such as salt marsh and sand dunes (through the protection and stabilisation of sand dunes and replanting coastal vegetation such as seagrass), acts as a natural buffer against rising sea levels. This absorbs wave energy and protects

inland areas from flooding, while also enhancing biodiversity and strengthening coastal /seascape character. For example, the Sussex Kep Recovery Project is recovering the once abundant kelp forests on the Sussex Coast.

- **Increasing carbon sequestration through seascape change**. Coastal and marine habitats, including saltmarshes, seagrass meadows and kelp forest, play a valuable role in climate change mitigation, through their ability to capture and store carbon. These habitats sequester carbon at 2-4 times the rate of mature tropical forests. Seabed sediments, the muds, sands and silts on the ocean floor are largest store of organic carbon. The UK's shelf seas cover some 500,000 km^2 and are estimated to store 205 million tonnes of carbon in seabed sediments – approximately 50 million tonnes more than held within our standing forests – along with coastal seagrass and saltmarsh habitats, UK marine ecosystems store about 220 million tonnes of carbon[5].The protection and restoration of these blue carbon stores will increase our capacity to meet the UK Net Zero target by 2050. Such seascape change can be guided through the SCA process, for example by identifying opportunities to restore or create blue carbon habitats, such as saltmarshes, in the right place.
- **Reversing coastal and marine habitats and species decline**. Through closer alignment and integration with the objectives of marine and coastal designations, and the potential introduction of a Marine Net Gain (MNG) policy, the application of SCA can help to ensure measures to reverse habitat decline are successful by setting out a baseline and providing a desired direction of change.
- **Measuring outcomes.** The online Natural England 'National Character Area' profiles, including the coastal NCAs, show the potential of an 'enhanced' LCA/SCA process, with links to data as well as details on landscape/seascape opportunities, which can be used to measure environmental outcomes. The application of integrated SCA/LCA offers the means to evaluate and monitor landscape and seascape change by setting out the baseline and direction of change.

Addressing the well-being crisis through the application of SCA

The application of the SCA process can help highlight the role that our coastal landscapes and seascapes can play in addressing the need for equality of access to our coastal landscapes and seascapes, while protecting wildlife habitats and tranquillity. This can be achieved while working within a framework of the wider spatial planning of the natural environment.

- **Support recreational access to coastal landscapes/seascapes**. The SCA process can highlight the role of our coastal landscapes and seas in providing social benefits of an intrinsic nature, such as health and well-being associated with access to some of our best loved and most tranquil landscapes. The application of SCA processes at a local level can provide evidence of the impacts of recreation and tourism on our seascapes. It can guide sustainable development of tourist infrastructure to improve access to and through seascapes, increasing recreational opportunities for engagement with the natural environment, while maintaining high quality seascape and wildlife assets.

Addressing coastal and marine change using SCA

Integrated LCA/SCA enables coastal landscapes and seascapes to be properly taken into account in a wide range of applications, such as decision making regarding future change, including guiding the appropriate siting, design and mitigation of new development both on- and offshore, management of the use of the sea and coastline and the development of planning policy at a local and regional level.

Addressing coastal/marine development change

The effects of activities and development in marine and coastal areas, on the landscape and seascape will vary on a case-by-case basis according to the development/activity type, its location and setting. The outputs of a character assessment can provide a baseline against which the effects of change can be judged, perhaps to inform judgements about seascape quality and value, or decisions about the appropriateness of new development.

- **Onshore coastal development change**, including housing and economic growth, can impact landscape/seascape character and tranquillity. Our coastal landscapes and inshore seas are also important to tourism and recreation (particularly in the south-west). The integrating framework of LCA/ SCA can inform good development planning, by helping to identify at an early stage the right site for the right development.

[5] Marine Conservation Society and Rewilding Britain, Blue Carbon, Ocean-based solutions to the fight the climate crisis

The LCA/SCA process can influence successful design and placemaking, with information about typical settlement forms and local vernacular to encourage sustainable development, while ensuring the local landscape and seascape character is retained or enhanced. The process can also highlight opportunities for offsetting impacts and for landscape/seascape and biodiversity enhancement.

- **Offshore development change**. There are a number of marine industries ranging from renewable energy to fisheries, which have the potential to increase in levels of activity over the next 20 years. These include:
  - Offshore energy generation, particularly renewables including wind energy, wave and tidal energy (such as tidal lagoons) and associated electricity network distribution cables, as well as carbon capture and storage, and nuclear power generation are predicted to grow. The oil and gas sector is still a key industry in the north-west and north-east, although this is predicted to decline in the next 20 years.
  - Commercial activity, including the extraction of marine aggregates (as a source of sand and gravel for the construction market) is an important industry in many areas but particularly the Severn Estuary and Bristol Channel. Over 90% of imported goods into England are transported by ship. The development of ports and shipping, particularly the naturally sheltered ports of the south-east with their connections to Europe, have the potential to grow. Dredging and subsequent disposal is also set to grow as it is crucial to enable wider and deeper ports to allow larger vessels to trade safely.
  - Aquaculture is a growing sector, with a significant potential for shellfish aquaculture, such as mussels. Fishing has historically constituted a major activity, and while still significant commercially, the level of activity has decreased in recent years.

The relative importance of these sectors varies by region, but across areas, the increases in levels of activity may result in trade-offs between marine sectors, with a competition for space. For example, the growth in offshore wind energy generation may preclude the growth of fisheries or marine aggregate development opportunities.

Technologies such as offshore wind, will have a key role to play in decarbonisation of the UK power sector and reaching net-zero targets. However, growth in this sector will continue to change the character of our seascapes. Some new or continued activities may have a negative impact on the natural environment, such as the increase in waste and nutrients from aquaculture, damage to seabed habitats from marine extraction and port development, which in turn can impact other sectors. For example, an increase in pollution and habitat destruction from aquaculture, may impact local tourism.

The negative impacts on the natural environment and trade-offs between sectors can be minimised through careful project design, guided by the application of SCA. The application of SCA can encourage changes to be implemented in ways that are sustainable and enhance seascape and landscape character, while accepting that change is inevitable.

Addressing coastal land use change

- **Land use change in relation to coastal changes**. Coastal changes, driven by sea level rises due to climate change, are significantly impacting farming practices and land use patterns along the English coastline, particularly in low-lying areas. Coastal erosion and flooding often lead to the abandonment of agricultural land, a reduction of agricultural intensity or adaptive strategies, such as changing to salt-tolerant crops to maintain agricultural productivity. Changing farming methods, or land abandonment will increasingly change the character of our coastal landscapes. For example, a shift away from arable production to livestock, or abandonment of farmland to scrub. The SCA process needs to acknowledge that adaptation to climate change along the coast will occur, which will have an impact on the character of our coastal landscapes.

Policy Change

- SCA enables the seascape to be considered in the development of integrated marine and terrestrial planning policy. SCA can be considered in the development of Local Authority plans and strategies, such as renewable energy strategies, recreation and tourism strategies and strategic development plans. At a regional level SCA is particularly valuable in the development of Marine Plans and can feed into the Management Plans for protected landscapes (National Parks and National Landscapes), as well and the identification of designated area boundaries. It may also provide baseline evidence for other more specialised policies and plans such as coastal and estuary management plans, and coastal access route planning.

Undeveloped Coasts

SCA can provide an evidence base to inform the conservation, protection and enhancement of our undeveloped coastal landscapes. These are most commonly found within our Heritage Coasts, or designated landscapes (National Landscapes and National Parks). There is an opportunity for SCAs to provide a framework for enhancing the natural beauty, landscape and heritage features of these coastlines while creating new wildlife-rich environments, improving the health of inshore waters and encouraging public access.

Conclusion

This paper highlights the significant role of the SCA process and its use in establishing a baseline and making decisions about future options to guide positive changes in the seascape and coastal landscapes.

There is an opportunity for the update of the SCA Approach document to be integrated with the LCA Approach. This will result in evidence documents that improve understanding, enable the conservation and enhancement of coastal and seascape character and recognise their inherent sensitivities, especially in the interface between the land and the sea. The update should ensure that an integrated LCA/SCA process can address the core challenges of the seascape/landscape in the face of ongoing climate change and biodiversity decline, while addressing evolving changes in our coastal and marine areas, ongoing development needs and human well-being. It should maintain a focus on the diverse applications of SCA/LCA while embedding the use of these processes as evidence in decision-making for a wide range of outcomes that remain relevant to our coastal landscapes and marine areas. It should promote positive change, creating future seascapes that are resilient, sustainable, maximise carbon storage, are nature-rich and valued for what they offer people, while also recognising the value people place on them.

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