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North East Inshore and Offshore Marine Plans Sustainability Appraisal. Non- Technical Summary. Draft.



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North East Inshore and Offshore Marine Plan Sustainability Appraisal. Non-Technical Summary Report.

Report prepared by: ClearLead Consulting Ltd. in association with WSP UK Ltd. and MarineSpace Ltd.



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Version	Author	Note
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1. Introduction

1.1. This report

The Marine Management Organisation (MMO) has simultaneously prepared marine plans for England's north east, south west and north west inshore and offshore marine plan areas and the south east inshore marine plan area. The marine plans for the [south inshore and offshore](#) and the [east inshore and offshore](#) marine plan areas have already been published.

As part of the marine plan- making process, a Sustainability Appraisal (SA) has been undertaken. The SA process and subsequent report (including this Non-Technical Summary) is a requirement of the Marine and Coastal Access Act 2009 and incorporates the requirements of The Environmental Assessment of Plans and Programmes Regulations 2004.

This SA has been carried out by ClearLead Consulting Ltd, in association with WSP UK Ltd and MarineSpace Ltd. on behalf of the MMO.

This is the Non-Technical Summary (NTS) of the draft North East Marine Plan Sustainability Report (SA Report).

The SA report is split into a number of parts:

- Non- Technical Summary (this report)
- The SA Reports incorporating:
 - Part 1: Introduction and Methodology
 - Part 2: Scoping Information
 - Part 3: Results of the Assessment.

1.2. What is a sustainability appraisal?

SA is a process, incorporating the requirements of the Strategic Environmental Assessment (SEA) Directive, which considers the economic, social and environmental impacts of an emerging plan (the three dimensions of sustainable development). The aim in undertaking SA is to identify a plan's likely significant effects and take steps to avoid and/or mitigate the negative effects as well as identify opportunities to maximise a plan's contribution to sustainability.

The SA Report and this non-technical summary (NTS) conform to the requirements of the SEA Directive, and so the layout and feel of both the full Report and this NTS is influenced by these requirements. The SA has been undertaken throughout the development of the North East Marine Plan and has informed the consideration of options as well as assessing the effects of the draft and final plans.

2. Background to the North East Marine Plan

2.1. Introduction

Marine plans set the direction for decision making to ensure efficient and sustainable use of our marine resources. Once prepared the marine plans will cover a 20 year period and will be reviewed regularly. Marine plans are intended to guide users to the most suitable locations for different activities, assist in managing marine resources to ensure sustainable levels and to ensure that a holistic approach to decision making is taken.

2.2. The North East Marine Plan

The UK Government vision for the marine environment is for, 'clean, healthy, safe, productive and biologically diverse oceans and seas'. The Marine Policy Statement (MPS)¹ is the framework for preparing Marine Plans and taking decisions affecting the marine environment. The UK high level marine objectives (HLMOs)², which form part of the MPS, set the broad outcomes for the marine areas in achieving this vision, and reflect the principles for sustainable development which are:

- Achieving sustainable marine economy
- Ensuring a strong, healthy and just society
- Living within environmental limits
- Promoting good governance
- Using sound science responsibly.

The North East Marine Plan has a defined vision which is outlined in section two of the North East Inshore and Offshore Marine Plan Sustainability Appraisal: Sustainability Appraisal Report Part 1: Introduction and Methodology.

2.3. Relationship with other plans and programmes

The North East Marine Plan fits into an existing hierarchy of plans, programmes, strategies and environmental protection objectives and these are set out in detail in Part 2 of the SA report. The North East Marine Plan has the following relationship with other plans and programmes:

- International legislation and policy which sets a number of targets, objectives and obligations which the North East Marine Plan should seek to contribute to
- National legislation and policy which outlines measures to achieve many of these obligations through setting regional and local targets for public bodies to achieve and by outlining principles which planning policies and decisions needs to adhere to

¹ Marine Policy Statement available at: <https://www.gov.uk/government/publications/uk-marine-policy-statement>

² HMG,NIE, WAG, SG (2009) Our Seas A Shared Resource - High Level Marine Objectives (online) available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/182486/ourseas-2009update.pdf

- Local and regional policy which sets out more specific local targets and local actions needed to achieve them.

Particularly important for the North East Marine Plan is the following:

- the MPS and the United Kingdom-wide High Level Marine Objectives which together provide the policy framework for the preparation of marine plans
- the National Planning Policy Framework and associated National Policy Statements
- the EU Maritime Spatial Planning Directive (2014/89/EU) which came into force in July 2014 in support of the Integrated Maritime Policy for the European Union. The Directive introduces a framework for maritime spatial planning and aims to promote the sustainable development of marine areas and marine resources. It also sets out a number of minimum requirements for marine plans.

As well as supporting the HLMOs set out in the MPS, the policies of the North East Marine Plan will support other relevant government aspirations such as those set out in the [25 Year Environment Plan](#), the [Industrial Strategy](#), the [Clean Growth Strategy](#) and sustainable development³ of the marine area.

Regulations require that the SA considers how environmental protection objectives are taken into account in the development of the plan or programme. For the North East Marine Plan SA a full review of the key objectives within other plans and policy documents has been undertaken for each topic and is reported in Part 2 of the SA report. These objectives have then been used to inform the development of an SA framework. The SA framework is then used to test the North East Marine Plan and recommendations are made to strengthen the plan.

2.4. Habitats Regulations Assessment (HRA)

The North East Marine Plan has also been subject to a Habitats Regulations Assessment (HRA), which aims to look at the implications of a proposed plan on one or more European designated sites in view of the sites' conservation objectives. The North East Marine Plan HRA process consists of screening of potential significant effects and a fuller assessment process. Further details can be found in the Appropriate Assessment Information Report.

All Appropriate Assessment reports are available at the following weblink:
<https://www.gov.uk/topic/planning-development/marine-planning>

³ As defined in [United Kingdom Sustainable Development Strategy](#)

3. The Sustainability Baseline

3.1. Introduction

It is important to understand the existing conditions (known as baseline conditions) and the key issues that should be covered as part of the SA process. The sustainability baseline comprises information on aspects of the environment, economy and society that could be affected positively or negatively by the implementation of the North East Marine Plan. Further information relating to the scope of each of the SA topics and background information is presented in sections 3-11 within the North East Marine Plan Sustainability Appraisal: Sustainability Appraisal Report Part 2. The baseline information identified has been summarised in Table 1 below.

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Table 1: Sustainability Baseline Summary: Key Sustainability Baseline, Issues and Characteristics of the North East Marine Plan Areas.

Key Sustainability Baseline, Issues and Characteristics of the North East Marine Plan Areas
<p>Cultural Heritage</p>
<ul style="list-style-type: none"> • there are numerous Scheduled Monuments, Listed Buildings and Registered Parks and Gardens, including in estuaries and tidal rivers within the inshore marine plan area • there are three wrecks protected under the Protected Wrecks Act 1973 within the north east inshore marine plan area • the Frontiers of the Roman Empire (Hadrian's Wall) World Heritage Site is within the north east inshore marine plan area • the Registered Battlefield of the Battle of Newburn Ford lies partly within the north east inshore marine plan area • various activities in marine plan areas have implications for the conservation of heritage assets but are not subject to licensing or, directly, to public authority decision-making. Depending on circumstances, these may include activities such as anchoring, diving and some forms of fishing. The character and magnitude of effects on the marine historic environment arising from unregulated activities may not have been quantified. Marine plans will need to consider what indirect measures can be taken to conserve heritage assets in respect of activities that are not regulated directly.
<p>Geology, Substrates and coastal processes</p>
<ul style="list-style-type: none"> • hold the Line is the preferred management option for coastal erosion from the shoreline management plans in the north east inshore marine plan area (94 units), followed by No Active Intervention (76 units), and Managed Realignments (29 units) • existing developments between Wilsthorpe and Skirlington, and Skirlington and Kilnsea, are threatened by erosion and may require relocation • some parts of the coast (especially Yorkshire) are susceptible to erosion including areas prone to large landslips. In common with the UK in general, sea level is rising; the presence of seawalls (for example) in some locations has led to 'coastal squeeze' of intertidal sediment habitats • in the inshore plan area, the seabed sediment matrix is a complex mixture of soft sediments including sandy gravel, muddy sand, gravelly muddy sand and gravelly sand. Patches of hard substrate, either exposed or near the surface, is present in some near-shore areas. Sand is the predominant seabed substrate in the offshore marine plan area along with patches of muddy sand, slightly gravelly sand and gravelly sand. These sediments are indicative of the wider North Sea basin as a whole • there are opportunities for Underground Coal Gasification off Teesside. Any future operations would impact on underground coal resources and may have wider environmental implications • there are four known locations (Druridge Bay and Seaton Sluice) where quicksand and sump holes exist, which could be mining legacy issues. There is a potential for other similar sites within the inshore marine plan area which causes a public safety issues.

Key Sustainability Baseline, Issues and Characteristics of the North East Marine Plan Areas

Seascape and Landscape

- large areas of the coast are famous for their iconic landscapes and views
- Durham Heritage Coast and wider Coastal Zone requires protection and enhancement
- special attention should be given to protecting the remote character, nature conservation interest, wildlife value and marine environment of the north Yorkshire and Cleveland and Flamborough headland heritage coasts. There is a need to safeguard the Heritage Coast at Redcar and Cleveland
- strong emphasis is placed on the protection and enhancement of local assets, including Durham and South Shields.
- there is a potential for landscape issues relating to underground coal gasification
- the Frontiers of the Roman Empire (Hadrian's Wall) World Heritage Site, including its setting, need protecting
- coastal erosion in Whitby and Scarborough can have a negative impact on the seascape setting of built heritage assets in these coastal locations, for example, Whitby Abbey and Scarborough Castle.

Water

- surfing activities occur at various beaches within the north east marine plan area. It is an important sport in the region. These beaches can be affected by reduced water quality, and any pressures which cause hydromorphological changes could affect the integrity of the surfing breaks
- the continued presence of structures in the North Sea will also have impacts on hydro-geomorphology
- whilst unlikely to be directly impacted by climate change, sea level rise and storminess will impact upon hydrological processes and could exacerbate the impacts of tides and currents on coastal areas
- warming in the north east has been identified to be between approximately 0.3 and 0.5°C per decade, over the last 3 decades.
- oil and gas activities within the north east are responsible for carbon dioxide emissions that can result in acidification of the marine environment
- issues regarding water quality exist around Fenham Flats
- eutrophication is occurring around Holy Island and Budle Bay caused by high nutrient levels. Algae blooms are smothering seagrass beds and soft sediments, causing anoxic conditions in places. The condition of Marine Protected Areas is suffering as a result, and Water Framework Directive targets are not being met. Marine plans could discourage proposals which add nutrients to this area
- in the North East, Northumbrian Water detail that 31 out of the 34 bathing beaches are affected by combined sewer overflows
- in 2016, there were six coastal bathing waters classified as poor, namely Scarborough South Bay, Clacton (Groyne 41), Walpole Bay (Margate), Instow, Ilfracombe Wildersmouth and Burnham Jetty North

Key Sustainability Baseline, Issues and Characteristics of the North East Marine Plan Areas

- septic tanks are prominent in the north east area and increasing tourism will increase their use and the risk over contamination to the nitric vulnerable area
- there is a problem with beach litter. It has social, amenity and biodiversity impacts. There is evidence to suggest that the problem is getting worse over time.

Air Quality

- the North Sea has one of the highest shipping densities in the world. Europe's three biggest harbours in Rotterdam, Hamburg, and Antwerp are located within this region. At any time, approximately 3000 ships are sailing in the North Sea. The steady increase in the number and size of ships leads to an increasing contribution of ships to air pollution in North Sea coastal areas
- whilst the contributions from shipping to nitrogen dioxide and sulphur dioxide concentrations are restricted to the open sea and the coastal areas in the southern North Sea and in Denmark, secondary pollutants, nitrate and sulphate aerosol particles as well as ozone, are transported far more inland. Their relative contribution to concentrations at the coast is however lower compared to nitrogen dioxide and sulphur dioxide
- ongoing challenges with air quality (from transport emissions amongst others) in Air Quality Management Areas at the coast and on land could lead to eutrophication of the marine environment and acid deposition effects.

Climate

- increase in the magnitude of winter flash floods due to increased winter rainfall and reduced summer rainfall
- seasonal mean and extreme waves are expected to increase
- the impacts of climate change are already being observed, and impacts are predicted to continue
- without any further investment in flood defences, the number of properties in England at medium or high risk could rise from 0.75 million to 1.29 million in 50 years
- there is also evidence of a shift in aggregation areas in response to climate change causing rising sea levels and loss of intertidal feeding areas, with estuaries and coasts to the north-east being favoured by some species
- presence of Chinese Mitten crab and effect on flood defences surrounding the River Tyne
- Yorkshire and the Humber has 351km of coast, with 203km (56%) eroding, but only 156km (43%) with defences or artificial beaches.

Communities, health, wellbeing

- fishing appears to be most important in the following settlements (although it should be noted these are the ports into which catches are taken and not necessarily where boats are registered):
 - Blyth

Key Sustainability Baseline, Issues and Characteristics of the North East Marine Plan Areas

- North Shields
- Whitby
- Scarborough.
- the north east experiences poor housing quality and high multiple occupancy levels
- doctors in deprived coastal towns in the north and east of England are prescribing almost twice as many antidepressants as those in the rest of the country. Blackpool, Sunderland and East Lindsey, in Skegness, fill the top three spots for the most prescriptions out of England's 326 districts
- there is planned regeneration in South and North Tyneside
- the north east marine plan areas have a growing manufacturing and engineering industry that facilitates development and decommissioning of offshore wind and oil (National Renewable Energy Centre, Port of Blyth, Teesport and Port of Tyne, Siemens Energy Service Training Centre, exports from the Nissan car manufacturing and the Whitby offshore renewables business management and harbour control centre). Marine plans may support local authorities and local enterprise partnerships, by identifying how these facilities can be promoted to enhance marine activities and increase skilled labour
- social opportunities exist through the development of the North East 'Renewable Energy Coast' and 'Centre for Offshore Renewable Energy'.

Economy

- dredging is an enabling activity which is essential to the functioning of ports and marinas and can have impacts on water and sediment pollution. Current safeguards have significantly improved the chemical status of the sediments around our coasts. This is due to reductions in the tonnage of contaminants which have been permitted to be disposed of at sea
- shipping is an essential and valuable economic activity for the UK. There are significant movements of ships around the UK coast and its ports, serving the UK's economic interests
- impacts are had on sensitive species from noise within the north east marine plan areas. For example, seismic surveys associated with extraction by Cleveland Potash Limited impacting lobster fisheries
- the majority of marine aquaculture in England consists of shellfish farming, particularly mussel farms. Other species include scallops as well as pacific and native oysters
- under climate change scenarios more frequent extreme storms and waves may affect safety of fishing vessels and negative impacts may be exacerbated by low oxygen conditions, and presence of pollutants and marine contaminants
- seaside tourism makes an important contribution to overall tourism. It supports some 21,000 jobs and contributes £3.6bn to the economy

Key Sustainability Baseline, Issues and Characteristics of the North East Marine Plan Areas

- recreational and sport fishing is widespread although participation rates are highest in the south west, south east and north east regions
- Seahouses has a lack of Blue Flag status beaches, but regardless illustrated a relatively high potential for beach activities as modelled by the MMO project, Modelling Marine Recreation Potential in England 2014
- modelling Marine Recreation Potential in England 2014 (MMO1064) also showed a high potential for surfing in Seahouses, windsurfing in Seahouses and Morecambe Bay, and diving around the Farne Islands
- economic growth could be constrained by environmental limits of activities
- with regards to industry in the coastal zone, the north east and north west inshore marine plan areas are particularly important.
- sea training is carried out within defined military practice and exercise (PEXA) training areas. There are military practice areas in each of the plan areas
- aggregate wharves in the north east include on the River Tees, River Tyne and Sunderland
- mineral resources and related infrastructure will be managed and safeguarded to meet current and future needs, including safeguarding the existing transport and processing infrastructure at Howdon Wharf to allow for the continued transfer and movement of marine aggregates
- Humber dredging area 5.05 million tonnes of material is permitted for extraction each year under existing licences. The Crown Estate identify that over the ten year period between 2002 and 2011 an average of 76% of the permitted dredging area has been dredged and there is an opportunity to supply approximately 2.1 million tonnes of extra material each year
- wave and tidal demonstration facilities adjacent to the north east inshore include: National Renewable Energy Centre (Offshore Renewable Energy Catapult) located in Northumberland, part of a UK based innovation and research centre for offshore wind, wave and tidal energy (note the National Renewable Energy Centre's wave and tidal facilities are all terrestrial)
- there are currently two operational offshore wind farms, the Blyth and the Teesside offshore wind farm. There is also one approved offshore wind farm, the Blyth offshore demonstrator offshore wind farm. The current combined offshore wind farm capacity for the north east marine plan area is 66.1 MW. The Hornsea Development Zone is in the north east offshore area, and is a 4GW wind project currently in development in Yorkshire
- to date, no wave or tidal activity has occurred or has been planned in the north east marine plan areas due to a lack of exploitable wave or tidal resource. It is therefore assumed that over the next 20 years, no wave or tidal developments will occur in the north east marine plan areas.

Biodiversity, Flora and Fauna

- potential new waste development along the river corridor and Tees Estuary could demonstrate an adverse impact on the integrity of SPA and Ramsar sites

Key Sustainability Baseline, Issues and Characteristics of the North East Marine Plan Areas

- effects of recreation affecting high tide roosts and feeding sites for wintering and passage waders as well as feeding grounds for breeding birds
- effects of Hornsea windfarm on birds and use of jet skis near breeding colonies for seabird species near RSPB Bempton Cliffs
- pressure from bait digging on numerous seabird and migratory bird species found along the coast of the plan area
- impact of shellfisheries on intertidal and subtidal rocky and estuarine habitats, including removal of non-target species and habitat damage or loss, including sensitive reefs and maerl beds. This is specific to the north east and south west marine plan areas.
- drastic reductions have been seen in the harbour seal populations in Scottish waters, which is also important for the north east plan areas because these seals forage in the plan area
- there is a decline in saltmarsh habitat around the Tyne and Tees Valley due to a lack of sediment supply, a lack of suitable sites for sediment accumulation and historical land reclaim
- specific negative impacts of invasive non-native species in the plan area, including cord grass colonising mudflats resulting in habitat loss for waders and fowl (Lindisfarne) and Chinese mitten crab burrows eroding riverbanks (Tyne)
- seabird populations are disturbed and impacted by a variety of activities, including disturbance by recreational users, offshore windfarms, bait digging and fisheries bycatch.

4. How the Assessment was Undertaken

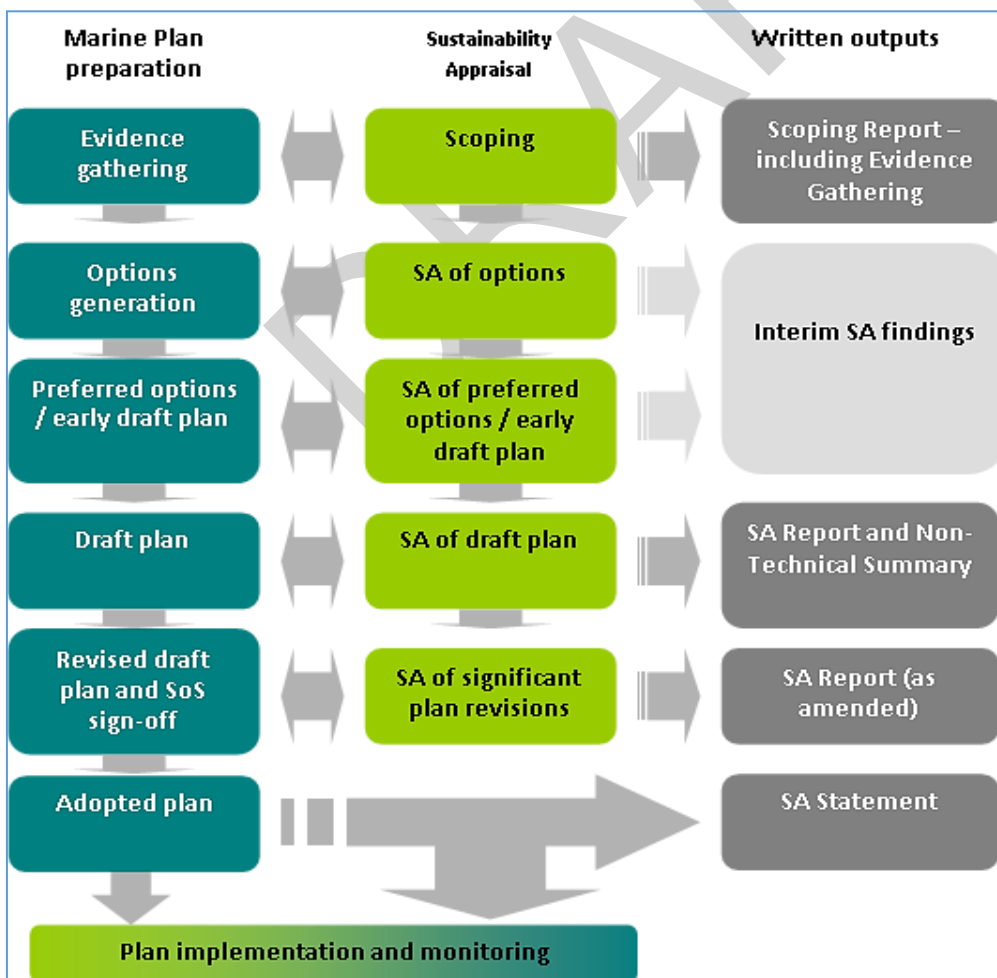
4.1. The SA Process

The stages in the SA process have been developed to take into account the five procedural stages of SEA:

- Stage A: (scoping) setting the context, establishing the baseline and deciding on the scope of the assessment
- Stage B: developing and refining alternatives and appraising the effects
- Stage C: preparing the SA Report
- Stage D: consulting on the SA Report and the North East Marine Plan and assessing any significant changes
- Stage E: monitoring the significant effects of implementing the North East Marine Plan

In practice, the SA is an iterative process which has been undertaken in parallel with the development of the North East Marine Plan and has fed into the development of the North East Marine Plan at appropriate intervals – see Figure 1.

Figure 1: Stages in the SA Process.



4.2. Stage A- Scoping

The purpose of the scoping stage was to decide the coverage (scope) and the level of detail of the SA. The scoping report was produced by a consortium composed of Ramboll Environ, ClearLead Consulting Ltd and Marine Planning Consultants (MPC) Ltd in April 2016. The draft scoping report was engaged on from 11th April 2016 to the 13th May 2016. Following some small factual changes, the final scoping report was published by the MMO. The scoping report forms part of the suite of documents which support this SA Report.

The scoping report outlines an SA framework which the North East Marine Plan and its alternatives are measured against in order to test their sustainability. The SA framework is set out in Table 2.

The scoping process also sets out the geographical and temporal scope of the SA:

Geographical: The North East Marine Plan includes the north east inshore and the north east offshore marine plan areas. The north east inshore marine plan area covers an area of approximately 687 kilometres of coastline stretching from the Scottish border to Flamborough Head in Yorkshire, taking in over 6,000 square kilometres of sea. The north east offshore marine plan area includes the marine area from 12 nautical miles extending out to the seaward limit of the Exclusive Economic Zone, a total of approximately 50,000 square kilometres of sea.

Temporal: The North East Marine Plan covers a 20 year period, and therefore the SA has considered the effects of the plan over the next 20 years and beyond where possible.

The scoping report was issued to the following statutory bodies:

- Natural England
- Historic England
- The Environment Agency.

In addition to statutory bodies, the scoping report was issued to 20 organisations for comments. The full list is located within section 3 of Part 1 of the Sustainability Appraisal Report.

Table 2: SA framework.

	Overarching SA topic	SA sub-topic
Physical and Chemical Aspects	Cultural Heritage	<ul style="list-style-type: none"> • heritage assets within marine plan areas • heritage assets adjacent to marine plan areas.
	Geology, Substrates and Coastal Processes	<ul style="list-style-type: none"> • seabed substrates and bathymetry • coastal features and processes.
	Seascape and Landscape	<ul style="list-style-type: none"> • effects on seascape and landscape.
	Water	<ul style="list-style-type: none"> • tides and currents • water temperature and salinity • pollution and water quality • marine litter.
	Air Quality	<ul style="list-style-type: none"> • air pollutants.
	Climate	<ul style="list-style-type: none"> • greenhouse gas emissions • climate change resilience and adaptation.
Social and Economic Aspects	Communities, Health and Wellbeing	<ul style="list-style-type: none"> • health and wider determinants of health and effects on communities • effects on protected equality groups.
	Economy	<ul style="list-style-type: none"> • ports and shipping • fisheries and aquaculture • leisure / recreation • tourism • marine manufacturing • defence • aggregate extraction • energy generation and infrastructure development • seabed assets.
Ecological Aspects	Biodiversity, Habitats, Flora and Fauna	<ul style="list-style-type: none"> • protected sites and species • benthic and intertidal ecology • fish and shellfish • marine megafauna • plankton • ornithology • invasive non-native species.

4.3 Stage B- Assessing the Options

The SEA Directive requires that the assessment identifies and evaluates reasonable 'alternatives' to what is proposed within the plan.

This stage involved assessment of the alternative options against the SA framework, taking into account the evidence base provided within the SA Database (Appendix A North East Marine Plan Sustainability Appraisal: SA Report Part 1: Introduction and Methodology). The key features of the options assessment approach were:

- an approach that assessed each option as a whole and to the same level of detail. 252 policy options were packaged into 32 policy groupings⁴, and the assessment provided a comparison of the options within each grouping
- an evidence-led assessment which referred to the baseline information to provide quality assured evidence as the basis of the assessment
- focused on identifying key potential significant effects to inform the decision making between options.

The assessment of options was undertaken in two stages:

- **Screening:** a screening process was carried out to determine whether the SA sub-topics were relevant to the specific grouping
- **Assessment of significant effects:** each option was considered against the relevant SA Framework sub-topics. Expert judgement and the updated SA Database (developed at the scoping stage of the SA process and refreshed in August 2017 prior to the assessment) were used as evidence for the assessment.

The options assessment of the draft North East Marine Plan was reported in an options assessment SA report which can be found [here](#).

4.4. Stage B- Assessing the Draft and Final Plan

The SA of the North East Marine Plan preferred policies has been undertaken as a 'baseline-led' assessment which considers how the baseline situation will change with the North East Marine Plan in place. This is shown in Part 3 of the North East SA report.

A qualitative approach has been used, comprising the assessment and description of effects, rather than a quantitative approach which is not considered appropriate or feasible at this strategic level, in view of the form and content of the plan.

The SA of the draft North East Marine Plan focuses on the preferred policies completed in July 2019. This consists of 59 policies arranged within 29 groupings outlined below:

⁴ Four groupings (Cumulative Effects, Governance, Evidence Gaps and Implementation) contained options which are not possible to assess through the SA because they are overarching policies and the options were not distinct.

Table 3: North East Policy Groupings.

North East Policy Groupings		
Economic:	Environmental:	Social:
<ul style="list-style-type: none"> • Aggregates • Co-Existence • Ports and Harbours (including shipping) • Aquaculture • Dredging and Disposal • Renewables • Cables • Oil and gas 	<ul style="list-style-type: none"> • Air Quality • Climate Change • Marine Litter • Biodiversity • Cumulative Effects • Marine Protected Areas • Natural Capital • Disturbance • Invasive Non-Native Species • Underwater Noise • Water Quality 	<ul style="list-style-type: none"> • Access • Fisheries • Defence • Cross-boundary Considerations • Seascape and Landscape • Tourism and Recreation • Social Benefits • Employment • Heritage Assets • Infrastructure

The same approach to assessment has been taken as for the assessment of options:

- preferred policies have firstly been screened to identify sub-topics of relevance to the policy grouping
- an assessment of significant effects was performed in relation to the relevant sub-topics only

The assessment criteria set out within Table 4 have been used to identify the potential effects of the North East Marine Plan policies.

Table 4: Policies Assessment Criteria.

Notation	Description
Degree to which baseline conditions may change (significance of effect) compared with the future baseline situation	
++	Major Positive Effect (significant positive): The plan policies are likely to lead to significant improvements in baseline conditions.
+	Minor Positive Effect: The plan policies are likely to lead to some improvements in baseline conditions.
0	Neutral Effect: The plan policies are unlikely to alter baseline conditions significantly.
-	Minor Negative Effect: The plan policies are likely to lead to a deterioration in baseline conditions.
--	Major Negative Effect (significant negative): The plan policies are likely to lead to a significant deterioration in baseline conditions.

Notation	Description
?	Uncertain Effect: It is not known whether the plan policies would lead to an improvement or deterioration in the baseline conditions ⁵ .
Direct / Indirect	
Direct	Effects that are a direct result of the plan policies.
Indirect	Effects that are secondary i.e. they occur away from the original effect or as a result of a complex pathway.
Reversibility of effects	
Reversible	It is considered that the effects upon the receptor group could be reversed if activities were to change in the future. The effects could be long-lasting, but the receptor may hence be able to recover or indeed improvements could be diminished.
Irreversible	It is considered that the effects upon the receptor group could not be reversed. This may apply to situations where, for example, features are destroyed forever, or systems/trends are irrevocably changed.
Permanence of effects	
Permanent	Effects could be lasting or intended to last or remaining unchanged indefinitely.
Temporary	Effects are not likely to be lasting or permanent.
Duration	
Short	Within three years of plan adoption – within the reporting period i.e. policy would have an immediate effect.
Medium	Within plan period (up to 20 years from adoption)
Long	Beyond plan period (more than 20 years from adoption)
Spatial Extent	
Beyond both plan boundaries	Effects are predicted to extend beyond the plan boundaries (i.e. cross-boundary) and could affect the terrestrial environment, neighbouring marine plan areas or other states.
Inshore and offshore plan-wide	Effects are predicted to occur within the inshore and offshore plan areas.
Inshore plan-wide only	Effects are predicted to occur within the inshore plan area only.
Localised	Effects are predicted to have a relatively small spatial extent, confined to the local area, typically <5km from source, within the plan boundaries.
Magnitude of effects	
High	Likely total loss of or major alteration to the receptor in question The effects are predicted to be permanent and irreversible.
Medium	Partial loss of/alteration/improvement to one or more key elements/features/characteristics of the receptor in question The effects are predicted to be medium-long term but reversible.

⁵ Please note that for the purpose of this SA, uncertain effects have been treated as potentially significant and mitigation measures suggested

Notation	Description
Low	Minor loss/alteration/improvement to one or more key elements/features/characteristics of the receptor in question The effects are predicted to be reversible and short term.

4.5. Stage C- Preparing the SA Report

The draft SA Report for the North East Marine Plan constitutes three parts:

- Part 1: Introduction and Methodology
- Part 2: Scoping Information
- Part 3: Results of the Assessment.

Material and documents generated as part of the SA process are available [here](#).

4.6. Stage D- Consulting on the SA Report

The draft North East Marine Plan and accompanying SA Report will be consulted on with the public and other key stakeholders during Quarter 1 of 2020.

4.7. Stage E- Monitoring

Monitoring the effects of the plan will be the responsibility of the MMO. Monitoring recommendations will be put forward for integration into the MMOs marine plan monitoring within the SA Adoption Statement.

4.8. Difficulties encountered

The North East Marine Plan is a regional scale plan which is not intended to address site or project-specific details. The large majority of the policies in the plan are generic or criteria-based policies and do not have a clear spatial dimension.

This results in uncertainty when predicting the effects of activities and consequently strategic impacts can be identified with the most certainty, together with the extent to which the marine plan seeks to avoid or offset these impacts. Correspondingly, this SA's predictions and proposed mitigation measures will primarily be at a strategic level.

5. Significant Effects of the Plan and Mitigation

5.1 Introduction

This section presents a summary of the assessment findings of the North East Marine Plan preferred policies by SA topic, the summaries of which are presented in Table 5 to Table 13 below. The full assessment of the preferred policies can be found within Technical Appendix B.

Table 5: Assessment results: Cultural Heritage.

Cultural Heritage	
Significant Positive Effects	++
<ul style="list-style-type: none"> the significance of heritage assets in the immediate vicinity of the north east marine plan areas, is susceptible to the impacts arising from activities within marine plan areas. The historic assets policies aim to protect heritage assets from developments that could result in adverse effects. 	
Significant Negative Effects	--
<ul style="list-style-type: none"> buried subsea cables have the potential to disturb both known and undiscovered archaeological sites. A preference for burying cables is included within the cables policies could exacerbate disturbance on heritage assets, both within and adjacent to the north east marine plan areas in the north east inshore marine plan area, there are four major ports and five minor ports, which require maintenance dredging to maintain access⁶. The baseline has identified the significant under exploited potential of buried heritage assets in the plan area, as well as the potential for adverse effects on those heritage assets that are already uncovered, from dredging and disposal. The dredging and disposal policies aim to safeguard dredging activity within the plan area, rather than increasing dredging activity, however, as dredging is an enabling activity which is essential to the functioning of ports and harbours, it is assumed that these policies will help dredging activity to continue the baseline has identified the significance of cultural heritage within the north east plan areas, particularly with regards to Tyne Gorge and North Yorkshire and Cleveland and Flamborough head-land heritage coasts. Policies NE-OG-1 and NE-OG-2 may not directly result in further oil and gas developments within the plan areas, however there are currently 15 licensed areas and 17 new blocks that have been provisionally awarded as part of the 31st licensing round. The 32nd round is currently in progress and may result in further blocks coming forward. Given that the oil and gas industry in the north east 	

⁶ Futures Analysis for the North East, North West, South East and South West Marine Plan Areas (June 2017)

Cultural Heritage	
contributes significantly to the UK overall supplies, it is assumed that these policies will ensure that development will continue, which could negatively affect heritage assets within the plan area.	
Uncertain Effects	?
<ul style="list-style-type: none"> • future ports, harbours and shipping activity have the potential to impact heritage assets, particularly those that may be buried and not yet uncovered. Associated port activities, such as dredging, could also be increased as a result. Future development is not yet known; however, this will be identified in harbour master plans to be developed as part of Maritime 2050⁷, which could allow for greater certainty • renewable energy developments have the potential to negatively affect the seabed and subsequent heritage assets, however, the extent of these effects is largely dependent on the device used, and the installation methods, and the potential for future proposals to come forward • aggregate activity has the potential to change seabed substrate bathymetry and hydrodynamic regime, which could alter coastal processes. There are currently no licensed aggregate extraction areas in the north east marine plan areas, but Dogger Bank (located within the north east offshore) has been included within Round 4 of the Crown Estates leasing rounds. Aggregate policies could help to safeguard this site for future aggregate developments, which have the potential to result in significant negative effects, however, there is no certainty on whether development will take place at this stage. 	

Table 6: Assessment results: Geology, Substrates and Coastal Processes.

Geology, Substrates and Coastal Processes	
Significant Positive Effects	++
<ul style="list-style-type: none"> • the climate change policies seek to increase resilience of geology to the effects of climate change, minimise adverse impacts on coastal change adaptation measures and support proposals which have the potential to increase flood defence and carbon sequestering habitats • the seabed provides a role for both nutrient cycling and carbon sinks, the importance of which has been identified within the supporting text to the natural capital policy grouping. As a result of this policy, it is assumed that seabed substrates and bathymetry would be offered protection, due to the importance of these assets. 	
Significant Negative Effects	--
<ul style="list-style-type: none"> • marine dredging has potential to result in the loss of seabed substrates, whilst disposal of dredge material can disturb the seabed at both the extraction and selected disposal site. The dredging and disposal policies aim to safeguard dredging activity within the plan area, rather than increasing dredging activity, however, as dredging is an enabling activity which is 	

⁷ Department for Transport, Maritime 2050, Navigating the Future, 2019

Geology, Substrates and Coastal Processes	
<p>essential to the functioning of ports and marinas, it is assumed that this policy help dredging activity to continue. As dredging activity at present is negatively impacting both coastal features and processes and seabed substrate and bathymetry, it is assumed that at best, the current baseline situation will continue.</p>	
Uncertain Effects	?
<ul style="list-style-type: none"> • aggregate activity has the potential to change seabed substrate bathymetry and hydrodynamic regime, which could alter coastal processes. There are currently no licensed aggregate extraction areas in the north east marine plan areas, but Dogger Bank (located within the north east offshore) has been included within Round 4 of the Crown Estates leasing rounds. Policies could help to safeguard this site for future aggregate developments, which have the potential to result in significant negative effects, however, there is no certainty on whether development will take place at this stage • coastal squeeze is an issue within the plan area, which is often exacerbated through human activity and the presence of coastal defences. The issue is likely to be exacerbated further by climate change and sea level rise, and the need to protect the coastline. The co-existence policy could help to prevent potential conflicts; however, it is not clear whether this applies to coastal defences • according to the baseline, the UK is locked into accelerated sea level rise, regardless of what is done about greenhouse gas emissions. Sea level rise has potential to give way to increased coastal erosion, inundation of the coastline and coastal squeeze. Due to the current lack of evidence on future scenarios of coastal processes, an uncertain effect has been identified in relation to the air quality policy sub-topic • the effects of renewable energy installations on potentially sensitive environmental features are unknown at present. The installation of renewable technology and subsequent reduced contributions to climate change may help to appease the impacts of increased storminess such as coastal inundation within the marine environment. However, due to the unknown type and location of future renewable sites, an uncertain effect has been identified, for the coastal features and processes sub-topic. 	

Table 7: Assessment results: Seascape and Landscape.

Seascape and Landscape	
Significant Positive Effects	++
<ul style="list-style-type: none"> • there is a close relationship between the presence of heritage assets and the character, value and appreciation of landscape and seascape. Heritage policies aim to protect heritage assets from future proposals, ensuring that the diversity of the marine environment, and its cultural heritage is protected • landscape and seascape policies aim to maintain and improve the seascape and landscape within the north east plan areas. Proposals which may harm the current seascape or landscape must demonstrate why this is necessary and mitigate adverse effects. 	
Significant Negative Effects	--
<ul style="list-style-type: none"> • oil, gas, and carbon capture, usage and storage (CCUS) developments have potential to negatively affect the seascape and landscape of the inshore marine plan area. Given the importance of the North York Moors and Northumberland Coast AONB, if development were to come forward, there is potential for significant negative effects. Policies NE-OG-1 and NE-OG-2 may not directly result in further oil and gas developments within the plan area; however, there are currently 15 licensed areas and 17 new blocks that have been provisionally awarded as part of the 31st licensing round. The 32nd round is currently in progress and may result in further blocks coming forward. Given that the oil and gas industry in the north east contributes significantly to the UK overall supplies, it is assumed that these policies will ensure that development will continue • there are two operational Round 1 offshore wind farms within the plan area, Blyth and Teeside, as well as a planned export cable for the Round 3 Teeside A and B projects. The most recent Crown Estate leasing round (Round 4) has identified Dogger Bank, located in the north east offshore as a potential site for further development. As development is likely to take place, and will be safeguarded by the renewables policies, a significant negative effect has been identified on landscape and seascape. 	
Uncertain Effects	?
<ul style="list-style-type: none"> • seascapes and landscapes are vulnerable to adverse and cumulative effects from multiple sectors and activities. As a natural capital asset, seascapes and landscapes can provide benefits associated with tourism, recreation, wellbeing and cultural value. As a natural capital asset, seascapes and landscapes can provide benefits associated with tourism, recreation, wellbeing and cultural value. However, these benefits and associated activities can themselves adversely affect seascape and landscape, forming an interdependent relationship. 	

Table 8: Assessment results: Water.

Water	
Significant Positive Effects	++
<ul style="list-style-type: none"> marine litter is cross-boundary in nature, as litter moves in the marine environment and litter originating from one marine plan area or even country can affect another. The cross-boundary considerations policy supporting text states that the alignment of marine planning with other planning, regulation and management bodies is necessary in order to manage pressures and aims to ensure cross-boundary impacts are minimised across international borders the natural capital policy aims to discourage proposals which may have a significant adverse impact on the marine environment and any natural capital which can be derived from this, and would thereby encourage improved water quality and pollution status of waters both within the north east marine plan areas and beyond a potential significant indirect positive effect has been identified in relation to the renewables policy grouping on the water temperature and salinity SA sub-topic. It is assumed that renewable energy generation could work to counter the advance of climate change and the associated effects on water temperature and salinity the water quality policy aims to enhance and restore water quality and ensure that new proposals are accountable for their potential negative impact on water quality. For this reason, a significant positive effect has been identified for the pollution and water quality sub-topic. 	
Significant Negative Effects	--
<ul style="list-style-type: none"> marine litter is a prevalent issue across the north east marine plan areas, of which the fishing industry is a key contributor. Significant negative effects have been identified in relation to the fisheries policy grouping and the marine litter SA sub-topic ports and shipping can contribute to marine litter. As the ports and harbours policy grouping could result in increased shipping activity, there is potential for increases for in marine litter. 	
Uncertain Effects	?
<ul style="list-style-type: none"> increased levels of tourism have potential to negatively impact water quality and increase marine litter within the north east inshore plan area. The tourism and recreation policy states that 'sustainable tourism and recreational activities' will be supported, however, it is not clear whether 'sustainable tourism' will result in a positive effect on water quality and marine litter. 	

Table 9: Assessment results: Air Quality.

Air Quality	
Significant Positive Effects	++
<ul style="list-style-type: none"> potential significant positive effects have been identified in relation to the air quality policy as developments that contribute to air pollution will need to consider the need to protect good air quality. 	
Uncertain Effects	?
<ul style="list-style-type: none"> ports and shipping activity contribute significantly to air pollution. The ports and harbours policies could result in further port and shipping activity in the region, and subsequently negatively impact air pollution. There is some uncertainty regarding 'sustainable expansion' and whether this will contribute to a reduction air pollution. Policy NE-PS-4, encourages short-sea shipping, which has potential to benefit air quality particularly when compared with other forms of transport. This could result in significant positive effects on air pollutant levels, however, it is not clear on the preference of policies NE-PS-1 and NE-PS-4, as they could have differing overall effects on air pollution. 	

Table 10: Assessment results: Climate.

Climate	
Significant Positive Effects	++
<ul style="list-style-type: none"> the climate change policies have resulted in a potential significant positive effect on climate change resilience and adaptation SA sub-topic, as it seeks to increase resilience and adaptation to the effects of climate change policies within the fisheries policy grouping encourages proposals that support a sustainable fishing industry, including the diversification and enhanced resilience to the effects of climate change. The potential to support climate change resilience and adaptation has resulted in a significant positive effect on the climate change resilience and adaptation SA sub-topic the marine protected areas policies have resulted in a significant positive effect on the climate change resilience and adaptation SA sub-topic, as the policies directly address the issue of climate change adaptation, with clear preference for proposals which enhance the adaptability of marine protected areas to climate change the renewables policies support energy generation from marine renewables which in turn could alleviate demand on greenhouse gas-emitting fossil fuel energy generation, resulting in significant positive effects on the greenhouse gas emissions SA sub-topic the air quality policy aims to ensure that developments which contribute to greenhouse gas emissions will need to consider the need to protect air quality, resulting in significant positive effects on the greenhouse gas emissions SA sub-topic. 	

Climate	
Uncertain Effects	?
<ul style="list-style-type: none"> ports and shipping activity contribute significantly to greenhouse gas emissions. Ports and harbours policies could result in further port and shipping activity in the region, and subsequently negatively impact on climate change. There is some uncertainty regarding 'sustainable expansion' and whether this will contribute to a reduction in greenhouse gas emissions. Policy NE-PS-4 encourages short-sea shipping, which has potential to benefit air pollution particularly when compared with other forms of transport. This could result in significant positive effects on air pollutants, however, this would depend on how the policy is implemented; if short-sea shipping is used in conjunction with existing shipping, overall shipping could increase, and potentially worsen greenhouse gas emissions oil and gas policies could result in oil and gas extraction within the north east marine plan areas, through site safeguarding. This could indirectly and directly result in an increase of greenhouse gas emissions, which could potentially have a significant negative effect on both climate change resilience and adaptation and the greenhouse gas emissions SA sub-topics. Conversely, policy NE-CCUS-1 has potential to result in CCUS which could reduce greenhouse gas emissions within the atmosphere. It is not clear what type of development could come forward as a result of this policy the air quality policy has the potential help to reduce the effect of future developments on climate change, however, according to the baseline, the UK is locked into accelerated sea level rise over this timeframe regardless of is done about greenhouse gas emissions. Due to the lack of evidence on future scenarios an uncertain effect has been identified. 	

Table 11: Assessment results: Communities, Health and Wellbeing.

Communities, Health and Wellbeing	
Significant Positive Effects	++
<ul style="list-style-type: none"> the baseline has identified income and employment deprivation issues associated with coastal communities across the north east inshore marine plan area. It is assumed that the employment policy grouping will help to provide employment opportunities for all, including those from protected equality groups. The employment policy has therefore resulted in significant positive effects on all three communities, health and wellbeing SA sub-topics it is assumed that the natural capital policy will seek to prevent and/or minimise adverse impacts on marine natural capital within the marine plan area, which in turn would have the potential to benefit local communities increased access to tourism and recreation activities, as a result of tourism and recreation policies, could provide significant social benefits for communities through, greater social cohesion, improved health and wellbeing (both physical and mental) and job creation. Significant positive effects have therefore been recorded in relation to the health and the wider detriments of health SA sub-topic 	

Communities, Health and Wellbeing	
<ul style="list-style-type: none"> the cross-boundary considerations policy aims for developments to consider cross-boundary impacts upon adjacent marine plan areas and the terrestrial environment including economic, social impacts. In order to achieve sustainable development, it is assumed that developments will need to consider their impact on communities (including health and wellbeing). This policy could result in a significant positive effect on health and the wider determinants of health SA sub-topic the social benefits policy aims to support proposals that enhance and/or promotes social benefits. Future proposals are encouraged to consider and enhance public knowledge, understanding, appreciation and enjoyment of the marine environment as part of (the design of) the proposal. As access to a high quality marine environment can make a significant contribution to the mental and physical health and wellbeing of communities, a significant positive effect has been identified for the health and the wider determinants of health SA sub-topic. 	
Uncertain Effects	?
<ul style="list-style-type: none"> renewable energy policies aim to support associated renewable technology supply chains, which could result in increased employment opportunities. However, at this stage, it is not clear as to whether any proposals will come forward, and the likely available employment opportunities. An uncertain effect has been identified in relation to the effects on communities SA sub-topic. 	

Table 12: Assessment results: Economy.

Economy	
Significant Positive Effects	++
<ul style="list-style-type: none"> an increase in access to the marine environment is predicted to result from the implementation of the access policy on leisure and recreation. This should allow for greater use of the natural environment for leisure and recreation through safeguarding, the aggregate policies could result in further aggregate extraction in the north east marine plan areas. The baseline has identified the significance of the UK marine aggregates and the importance they could play in the future for meeting housing demands and provision of fill for major coastal infrastructure projects, such as ports, coastal defences, renewable energy and nuclear energy projects electrical interconnections with other nations help to contribute to UK energy security, affordability and decarbonisation objectives. The cables policy grouping will help to enable further cable development within the plan area, and could ensure energy security for the future. Significant positive effects have been identified in relation to the energy generation and infrastructure development and seabed assets SA sub-topics the fisheries policies will help to encourage further fisheries and aquaculture development within the north east marine plan areas, which has resulted in a significant positive effect on the fisheries and aquaculture SA sub-topic 	

Economy

- the baseline has identified the importance of oil and gas to the UK economy. Oil and gas policies aim to safeguard areas for potential future oil and gas extraction within the north east marine plan areas, resulting in a significant positive effect on the energy generation SA sub-topic
- tourism and recreation policies aims to protect existing leisure and recreational activities and could result in expansion and diversification of existing developments as well as new proposals. This has resulted in significant positive effects on both the leisure and recreation and tourism SA sub-topics
- the renewable energy policies aim to safeguard areas for future renewable development and promote new renewable technologies. Significant positive effects have been identified in relation to the energy generation and infrastructure development SA sub-topic
- the implementation of the employment policy grouping could result in significant positive effects on the ports and shipping, fisheries and aquaculture, leisure and recreation, tourism and energy SA sub-topics
- recreational activity within the north east inshore marine area is high, especially for water based activities such as surfing and recreation boating. This can mean that the inshore area can be busy and complex to manage. This is highlighted within the co-existence policy supporting text as important area for space optimisation, and for this reason a significant positive effect has been identified for the leisure and recreation SA sub-topic
- the north east marine inshore and offshore marine plan areas are important for fisheries. Policy supporting text has stated the importance of fishing and the need for other activities to recognise core or historical fishing grounds to avoid effects upon this activity and consult with the fishing community to support co-operation and minimise conflict between sectors. It is therefore assumed that the co-existence policy will help to protect fishing in the plan area, and for this reason, a significant positive effect has been identified.

Uncertain Effects

?

- air quality policies could result in the limitation of future heavily polluting industries, in particular oil and gas developments. However, there is potential that the policy could result in a shift towards cleaner energy sources and create new opportunities within the energy sector
- it is unclear from the access policy how public access to areas used for defence will be treated. There may be some activities which are incompatible with public access, and for this reason an uncertain effect has been identified
- the aquaculture policies have the potential for a significant positive effect on fisheries and aquaculture, both of which are large sectors within the north east marine plan areas. It directly addresses the need for future development to consider nearby aquaculture facilities, and encourages sustainable design. However, the terms which would be acceptable for proposals which will adversely affect aquaculture are unclear

Economy

- preference towards defence activity could see some recreational activity and new recreational proposals limited within the plan area, and there is potential for issues with relation to access. Uncertainty has been recorded as the proposals will need to be considered on a case by case basis and it is unclear from the policy wording which proposals would require authorisation
- the fishing industry is dependent on a healthy marine environment. It is dependent on the marine environment being able to support healthy fish stocks which are free of persistent pollutants and heavy metals. However, through its reliance on fish stocks as a natural capital asset, fishing itself has the potential to have a direct adverse impact on the marine environment. It is uncertain, therefore, how the interdependent nature of fisheries and aquaculture on the natural capital assets provided by the marine environment would affect the industry
- leisure and recreation associated activities can benefit from the natural capital afforded by the marine environment (economic, outdoor recreation, increased visitor numbers), however, these activities may have a significant adverse impact on elements of marine and coastal natural capital, and therefore could be limited by this policy
- aggregate extraction is dependent on, and benefited by, the natural capital which provides marine aggregates. However, it may have a significant adverse impact on other elements of marine and coastal natural capital such as biodiversity, and as such, may be impacted by the nature of the natural capital policy
- ports have a vital role in the import and export of energy supplies and will need to be responsive both to changes in different types of energy supplies needed and to the need for facilities to support the development and maintenance of offshore renewable sites. There is potential for the renewable policies to result in significant positive effects on shipping, however, further development as well as the restrictions associated with some developments (in particular wind developments) will further reduce available space and add complexity to already challenging coastal waters
- it is unclear if developments for aquaculture and fisheries would be deemed to have an adverse effect on seascape or be within the public interest, and therefore be limited by the seascape and landscape policies.

Table 13: Assessment results: Biodiversity, Flora and Fauna.

Biodiversity, Habitats, Flora and Fauna	
Significant Positive Effects	++
<ul style="list-style-type: none"> • the implementation of the marine protected areas policies could have potential for significant positive effects on benthic and intertidal ecology, as it may increase the adaptability of benthic and intertidal environments to the effects of climate change, and make suitable arrangements for the spatial changes in distribution of habitat types • the cumulative effects policy grouping is predicted to have a significant positive effect on the benthic and intertidal environment, as it will address adverse cumulative effects from future proposals • the invasive non-native species policy grouping directly aims to prevent the introduction and increase of invasive non-native species throughout the plan area. Transport of invasive non-native species, as well as areas of potential colonisation are addressed within this grouping, which should help to form a well-rounded approach to tackling this issue • the north east marine plan areas are both nationally and internationally significant for bird populations and includes Roseate Terns. The baseline has identified the existing co-existence issues with aggregate extraction, dredging, mineral extraction and fishing. The co-existence policy grouping is likely to result in further protection for the north east bird populations. 	
Significant Negative Effects	--
<ul style="list-style-type: none"> • the increased number of aquaculture facilities which could result from the aquaculture policies, may have positive effects on local fish and shellfish species. However, unless carefully managed, there is potential for increased eutrophication, altering of food sources and increased disease transmission. Competition may also occur between new species and native lobster populations • the installation of buried subsea cables has the potential to disturb benthic and intertidal habitats. The preference that the cable policy grouping gives to buried cables has resulted in a significant negative effect particularly on benthic habitats within the marine plan area • the aquaculture policies also have potential to have a significant negative effect on the benthic and intertidal ecology SA sub-topic. This policy grouping promotes aquaculture developments, which could lead to an increase in the nutrients and pollutants present within benthic and intertidal sediments, altering species composition. Negative effects have also been identified on fish and shellfish • noise impacts from marine dredging are already having an impact on marine megafauna within the marine plan areas. The dredging and disposal policy could result in further dredging activity within the plan area, worsening the current situation. This has potential to result in significant negative effects on the marine megafauna SA sub-topic, as well as ornithology • the implementation of the underwater noise policy grouping could have significant negative effects on marine megafauna and fish and shellfish. Policies in the grouping could lead to the development of proposals which directly alter fish movement 	

Biodiversity, Habitats, Flora and Fauna

patterns, therefore altering energy expenditure. Species which are not "highly mobile" would not be protected by this policy. This could lead to the irreversible loss of populations. The policy grouping may also negatively affect protected sites and species

- offshore energy developments increase noise, which is likely often made significantly worse during construction. The production of noise in the marine environment can have varying effects on marine mammals, including the alteration of feeding behaviour, increased energy expenditure and death due to altered dive patterns. Given the presence of oil and gas development already in the north east plan area, the safeguarding that the oil and gas policies provide could ensure activity continues. This has resulted in a significant negative effect on marine megafauna and the benthic and intertidal habitats SA sub-topics
- bycatch of marine mammals by fisheries and their entanglement by marine litter are two separate issues which could be exacerbated by the fisheries policies
- associated port and shipping activity, in particular dredging, has potential to impact sub-tidal sediments and the baseline has identified that at various locations near large ports, subtidal rocky habitat has been lost due to construction, infrastructure (mainly coastal) or via smothering from dredged deposits. Shipping also poses the risk of water pollution which can indirectly impact benthic and intertidal ecology. These activities could increase as a result of the ports and harbours policies
- ports and shipping activity could increase as a result of the ports and harbours policy grouping. This could result in increased disturbance as well as potential collisions with marine megafauna and ornithology.

Uncertain Effects

?

- aggregate extraction has the potential to lead to the loss of subtidal rocky habitats and benthic species and habitats, fish and shellfish and ornithology. There are currently no licensed aggregate extraction areas in the north east marine plan areas, but Dogger Bank (located within the north east offshore) has been included within Round 4 of the Crown Estates leasing rounds. Policies could help to safeguard this site for future aggregate developments, but it is not known for certain whether any sites will come forward
- noise effects from aggregate activity can negatively affect marine megafauna within the marine plan areas. However, as there is no certainty on whether development will take place at this stage, an uncertain effect has been identified
- benthic and intertidal ecology is being heavily impacted by a number of industries within the north east marine plan areas (e.g. aggregates, dredging, fishing cables and recreation). Policy supporting text aims to help protect habitats and species, but it also aims to protect industries that are damaging to benthic and intertidal habitats
- it is unclear if the cumulative effects policy grouping will extend to those which are cross-boundary cumulative effects. Birds and marine megafauna are often highly migratory species, and may therefore experience the cumulative effects originating

Biodiversity, Habitats, Flora and Fauna

within multiple plan areas. Uncertain effects have therefore been recorded with regards to the ornithology and marine megafauna SA sub-topics

- fisheries pose a threat to vulnerable or rare species and whilst the fisheries policy grouping seeks to protect essential fish habitat, it is unclear whether this would apply only to fish habitat of commercially important species
- it is unclear from the oil and gas policy grouping if protected sites and species or oil and gas proposals would be given priority in the policy hierarchy. Future designations of protected sites could be prevented by the implementation of the oil and gas policy grouping
- the leisure and tourism policy could result in increased recreational pressures on marine megafauna and ornithology. It is uncertain what 'sustainable tourism and recreation activities' entail, and therefore whether this policy would address issues with increased tourism resulting in increased disturbance on marine megafauna
- the potential effects of the biodiversity policy are uncertain for the Plankton SA sub-topic. Plankton are the basis of all marine food webs, including those of commercially important species. They are affected by several indirect anthropogenic drivers, including warming sea temperatures and ocean acidification as a result of climate change, and eutrophication through nutrient run-off
- renewable infrastructure has potential to result in adverse effects on the hydrodynamics of the estuarine environment and can affect on intertidal and subtidal habitats. The three policies have the potential to result in further renewable activity within the north east plan areas, however, the likelihood of future proposals and the type of future proposals is not known
- ornithology and marine megafauna within the north east marine plan areas provide local economic benefits at present, and it has been identified that the opportunity exists for this natural capital asset to provide further tourism, recreation and educational opportunities. However, these activities, in addition to other activities which derive benefits from marine and coastal natural capital assets (such as the operation of offshore windfarms, fisheries and bait digging), can themselves adversely affect the natural capital assets. An uncertain effect has therefore been identified due to this interdependent nature.

5.2 Mitigation

Mitigation measures are measures suggested to prevent, mitigate, reduce or offset negative, cumulative or uncertain effects. Where significant negative or uncertain effects were identified within the policy assessment, mitigation has been provided via the following (either as standalone or in combination):

- **general mitigation:** this may be provided through other policies within the North East Marine Plan; existing plans and policies (such as local plans, national park management plans) or through other processes, for example, environmental impact assessment (EIA)
- **specific mitigation:** this mitigation type has recommended alterations to either the supporting text or policy wording. A summary of policies with proposed mitigation can be seen in Table 14 below.

Further details on proposed mitigation for each of the SA topics can be found in sections 5-13 in Part 3 of the North East Inshore and Offshore Marine Plan Areas Sustainability Appraisal.

Table 14: Summary of specific mitigation measures.

Mitigation Type	Policies with proposed specific mitigation
Changes to supporting text	NE-AGG-1, NE-AGG-2 and NE-AGG-3 NE-MPA-1 and NE-MPA-4 NE-AIR-1 NE-AQ-1 and NE-AQ-2 NE-DD-1, NE-DD-2 and NE-DD-3 NE-FISH-3 NE-ML-1 and NE-ML-2 NE-BIO-1, NE-BIO-2 and NE-BIO-3 NE-NG-1 NE-CO-1 NE-HER-1 NE-CC-5 NE-DEF-1 NE-DIST-1 NE-SCP-1 NE-OG-1 and NE-OG-2
Changes to policy wording	NE-BIO-2 NE-FISH- 1, NE-FISH-2 and NE-FISH-3 NE-ML-1 and NE-ML-2 NE-UWN-1 and NE-UWN-2

6. Cumulative Effects Assessment

6.1 Introduction

The SEA Regulations require an assessment of cumulative effects. Cumulative effects are the combined impacts of a single activity, plan or programme or multiple activities, plans or programmes. The individual impacts from a single development may not be significant on their own but when combined with other impacts, those effects could become significant.

The significance of cumulative effects resulting from a range of activities, or multiple incidences of one activity, may vary based on factors such as the nature of the projects proposed and the sensitivity of the receiving communities and environment.

The cumulative effects assessment therefore includes:

- consideration of how different aspects of the North East Marine Plan may interact to cause cumulative effects on a receptor
- how the North East Marine Plan can cause cumulative effects in association with other programmes, plans, policies and projects.

6.2 Potential Cumulative Effects of all Policy Groupings

Table 15 below summarises both the potential positive and negative cumulative effects identified for each SA Topic from the assessment of policies.

The full details of the cumulative effects identified, as well as mitigation, for each of the SA topics in relation to the policy groupings, is outlined in Table 11 in section 13 in Part 3 of the North East SA Report.

Table 15: Summary of Significant Effects.

SA topic	Associated Policy Groupings	Negative Cumulative Effect	Potential positive cumulative effects
Cultural Heritage	<p>Negative cumulative effects: aggregates cables dredging and disposal infrastructure oil and gas renewables shipping and ports.</p> <p>Positive cumulative effects: seascape and landscape heritage assets.</p>	<p>A number of economic policies have resulted in potential negative cumulative effects. Negative cumulative effects will be dependent on the type and number of developments that come forward, as a result of policies, and their proximity to the archaeological features.</p>	<p>The seascape and landscape policy grouping working in combination with the heritage assets policy grouping could result in positive cumulative effects.</p>
Geology, Substrates and Coastal Processes	<p>Negative cumulative effects: aggregates dredging and disposal co-existence.</p>	<p>Aggregate extraction and dredging and disposal activities have potential to negatively affect geology, substrates and coastal processes. If a number of aggregate and dredging and disposal developments come forward, from the implementation of these policies, there is potential for adverse effects to occur.</p> <p>The co-existence policy could result in a number of new developments coming forward within the marine plan area. If multiple developments came forward,</p>	<p>N/A</p>

SA topic	Associated Policy Groupings	Negative Cumulative Effect	Potential positive cumulative effects
		that could affect geology, substrates and coastal processes, there is potential for significant negative effects.	
Landscape and Seascape	<p>Negative cumulative effects: aggregates cables infrastructure oil and gas renewables.</p> <p>Positive cumulative effects: seascape and landscape heritage Assets marine protected areas.</p>	A number of economic policies have resulted in potential negative cumulative effects. Negative cumulative effects will be dependent on the type and number of developments that comes forward, as a result of policies, and their proximity to designated sites, local beauty spots and areas considered to be of a high landscape value.	Seascape and landscape policy grouping working in combination with the marine protected areas and heritage assets policy groupings, could result in positive cumulative effects.
Water	<p>Negative cumulative effects: aquaculture co-existence fisheries marine litter oil and gas ports and harbours tourism and recreation.</p> <p>Positive cumulative effects: biodiversity marine litter seascape and landscape.</p>	Negative cumulative effects have potential to arise, as a number of economic policies support developments that could negatively affect water quality. In isolation, these developments may not be significant, but if numerous developments came forward as a result of these policies, there is potential for significant negative effects.	Biodiversity policies have potential to result in minor positive cumulative effect in combination with other marine litter policies. Similarly, seascape and landscape policies working in combination with marine litter policies have potential to result in significant positive cumulative effects on marine litter.

SA topic	Associated Policy Groupings	Negative Cumulative Effect	Potential positive cumulative effects
Air Quality	Negative cumulative effects: ports and harbours tourism and recreation.	Ports and harbours and tourism and recreation policies could result in developments that could contribute to air pollution. In isolation, these developments may not be significant, however, if multiple developments from both policies, or just one of the policies, there is potential for significant negative effects.	N/A
Climate	Negative cumulative effects: oil and gas ports and harbours.	Ports and harbours and oil and gas policies could result in developments that could contribute to air pollution. In isolation, these developments may not be significant, however, if multiple developments from both policies, or just one of the policies, there is potential for significant negative effects on climate.	N/A
Communities, Health and Wellbeing	N/A	N/A	N/A
Economy	Negative cumulative effects: aquaculture climate change disturbance invasive non-native species marine litter renewables	Negative cumulative effects have potential to arise, depending the type and number of policies which may come forward, particularly those that could result in developments that could inhibit economic activity (e.g. air quality restrictions).	N/A

SA topic	Associated Policy Groupings	Negative Cumulative Effect	Potential positive cumulative effects
	underwater noise.	Similarly, negative cumulative effects have potential to arise depending on the type and number of developments that come forward as a result of policy implementation and the preference given to economic policies.	
Biodiversity	<p>Negative cumulative effects: access aggregates cables climate change disturbance dredging and disposal fisheries oil and gas ports and harbours tourism and recreation renewables.</p> <p>Positive cumulative effects: marine protected areas biodiversity fish and shellfish.</p>	<p>A number of economic policies have resulted in potential negative cumulative effects on biodiversity. In isolation, these developments may not be significant, but if numerous developments come forward as a result of a single policy or multiple policies, there is potential for significant negative effects on biodiversity.</p> <p>Cumulative effects would also be dependent upon how these policies are implemented and the preference given to biodiversity policies, and the nature (susceptibility to damage) and spatial extent of the biodiversity in question.</p>	<p>A positive cumulative effect has been identified as having the potential to occur on fish and shellfish, in relation to the marine protected areas policy grouping working in combination with the fish and shellfish and policy grouping.</p> <p>A potential significant cumulative positive effect has been identified in relation to the marine protected areas policy grouping working in combination with the biodiversity grouping.</p>

6.3 Potential Cumulative Effects with other programmes, plans, policies and projects

Table 12 within Section 13 of the Sustainability Appraisal: Part 3, presents the relevant international, national and regional plans, policies and strategies which could give rise to potential cumulative effects in combination with the North East Marine Plan.

The majority of the policies and plans reviewed will result in positive cumulative effects. This is because they strengthen environmental protection, for example by reducing greenhouse gas emissions, improving air or water quality, protecting designated sites for nature conservation, landscape or the historic environment. However, there is potential for development to cause negative cumulative effects, particularly where development in adjacent terrestrial or marine areas can act in combination to impact on receptors. There are a number of policies within the South East Marine Plan which do help to mitigate these effects:

- Cumulative Effects Policy NE-CE-1
- Natural Capital Policy NE-NG-1
- Co-existence Policy NE-CO-1
- Cross-boundary considerations Policy NE-CBC-1
- Environmental protection policies
- Economic development (including fisheries) policies.

7. Monitoring of Residual Effects

The SEA Regulations require that the significant environmental effects of plans and programmes be monitored. This intends to allow the early identification of unforeseen adverse effects so that appropriate remedial action can be taken.

Therefore, monitoring undertaken for the North East Marine Plan as part of the SA, and as part of the implementation and monitoring of the adopted North East Marine Plan, should help to:

- monitor the significant effects of the draft North East Marine Plan
- track whether the North East Marine Plan has had any unforeseen effects
- ensure that action can be taken to reduce / offset the significant negative effects of the plan.

The requirements of the SEA Regulations focus on monitoring the significant and unforeseen effects of the Marine Plan. Therefore, the SA monitoring framework should be focused only on monitoring those effects which are significantly negative or uncertain.

Following the consultation period, the MMO will prepare the final North East Marine Plan and the final SA will be prepared alongside this. Any revisions to the Plan at this stage in response to suggested mitigation or consultee comments will be reviewed and the SA amended accordingly. Following this, the residual significant effects will be identified and a monitoring framework for these effects will be proposed.

The North East Marine Plan process will itself include a comprehensive monitoring programme which is focused on the achievement of the plan's objectives. This monitoring programme will enable the MMO to track the success of policies and also to monitor the baseline environmental, economic and social conditions of the marine plan areas. The monitoring also contributes to the three-yearly reporting to parliament, which in turn provides a mechanism for reviewing and amending the plan or individual policies. The intention is that the SA framework will be linked to this where practical.