Marine Management Organisation

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

North West Marine Plans Sustainability Appraisal: Non-Technical Summary.

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1. Introduction

1.1. This report

The Marine Management Organisation (MMO) has simultaneously prepared marine plans for England's south west, north east 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 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 of the draft North West 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 West 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 West 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 West 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 West Marine Plan has a defined vision which is outlined in section two of the North West 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 West 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 West 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 West 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 outs more specific local targets and local actions needed to achieve them.

Particularly important for the North West 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 West 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 development[3] 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 West 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 West Marine Plan and recommendations are made to strengthen the plan.

2.4. Habitats Regulations Assessment (HRA)

The North West 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 West 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 West 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 West Marine Plan Sustainability Appraisal: Sustainability Appraisal Report Part 2. The baseline information identified has been summarised in Table 1 below.

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

Key Sustainability Baseline, Issues and Characteristics of the North West Marine Plan Areas
Cultural Heritage
• designated heritage assets in the vicinity of marine plan areas include World Heritage Sites (Frontiers of the Roman Empire Hadrian's Wall Military Zone), Scheduled Monuments, Listed Buildings, Registered Parks and Gardens and Registered Battlefields • the north west inshore plan area benefits from increased visitor numbers due to the quality and value of the historic environment, however this creates a challenge around managing this in a way that does not negatively impact the environment • various activities in marine plan areas such as anchoring, diving and some forms of fishing have implications for the conservation of heritage assets but are not subject to licensing or, directly, to public authority decision-making. The character and magnitude of effects on the marine historic environment arising from unregulated activities may not have been quantified and there is the need to consider what indirect measures can be taken to conserve heritage assets in respect of activities that are not regulated directly • the Hadrian's Wall World Heritage Site also has associated Roman sites such as Bew Castle • Sefton's natural and heritage assets together with its landscape character should continue to contribute to the Borough's sense of place, local distinctiveness and quality of life.
Geology, Substrates and coastal processes
• there are opportunities for Underground Coal Gasification overlapping the Dee Estuary and Cumbrian coast. Any future operations would impact on underground coal resources and may have wider environmental implications • an issue exists surrounding the management of potential flooding caused by high tides and surface water pumps not working. This is a challenge in low lying areas such as Fylde, and may be exacerbated by increasing access to the coast • there is a necessity to balance the needs to protect some undeveloped coast in the South Lakeland District with the need to provide for new development including land based maritime uses for coastal recreation and tourism • continually altering channels and sandbanks in the Solway Firth have created uncertainty and risk. There is a changing shoreline, with several areas vulnerable to erosion. Coastal defences are a feature in several locations • physical processes that affect the highly dynamic coastal environment (causing either erosion or deposition) include those derived from wind, waves, currents and tides. However, in the absence of human intervention or activity, rapid changes caused by coastal processes are restricted to shallow areas where wave action is strong. The area of greatest change is in the coastal zone with softer coastlines most at risk from rapid change. Coastal erosion is mainly a local to regional process and erosion is predicted to affect approximately 30% of England's coastline.

Key Sustainability Baseline, Issues and Characteristics of the North West Marine Plan Areas
Seascape and Landscape
• the intrinsic qualities of the St Bees Head Heritage Coast require protection in terms of development proposals within, or affecting views from, the designation • the special qualities of the Lake District National Park should be conserved and enhanced, and proposals which are consistent with National Park purposes and duty should be supported • views to the Isle of Man could be affected by activities within the north west plan areas • World Heritage Sites in the vicinity of the marine plan areas include the Frontiers of the Roman Empire (Hadrian's Wall), the settings of which need to be protected • any potential development in the marine environment which is inter-visible with the coast (or coastal developments themselves) may influence views in different ways depending on structure type, size, number, type of movement and orientation, coastal form, lighting, aspect and scale, settlement pattern and type. Attitudes of people observing the change and the resultant development typically also vary widely • visual impacts may arise from developments which are built directly at the coast (such as harbours) or at some distance from the coast, such as offshore wind turbines.
Water
• warming in the north west has been identified to be one of the most pronounced areas at 0.7°C per decade over the last 3 decades • oil and gas activities within the north west are responsible for carbon dioxide emissions that can result in acidification of the marine environment • cooling water effluent from Heysham 1 and 2, Moorside and Sellafield on Cumbria's Energy Coast increases the temperature of the area in which it is discharged. There may be an opportunity to promote a sea bass nursery in this area • the north west has been identified as having potential for wave, tidal stream and tidal range energy resources • there are five coastal water bodies and 12 transitional water bodies located within the north west inshore marine plan areas, specifically within the Solway Tweed, North West and Dee River Basin Districts. In terms of overall status, six water bodies (three coastal and three transitional) were classified as good, nine water bodies (two coastal and seven transitional) were classified as moderate, one transitional water body was classified as poor and one transitional water body was classified as bad in 2015, primarily due to ecological parameters failing to achieve good ecological status • although bathing water quality has improved in the plan area, a challenge exists around sewage pollution impacting water quality, which in turn prevents shellfish harvesting from shellfish and mussel beds in Morecambe Bay and the Lune estuary. • 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

Key Sustainability Baseline, Issues and Characteristics of the North West Marine Plan Areas
• higher densities of offshore litter have been found at specific locations, such as Carmarthen Bay, North Cardigan Bay, in the Celtic Deep. This suggests that these could be areas of accumulation, where litter gathers because of the effects of winds and currents.
Air Quality
• there is the potential for negative cumulative ecological effects from air quality as a result of new nuclear power stations, such as the proposed development at Sellafield Nuclear Power Station • 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 • more sea defences are likely to be required around low lying areas (e.g. Fylde) because of the predicted effects of climate change, which may cause damage to natural habitats • 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 • climate change is leading to melting of sea ice and opening up of new transport routes. There is an opportunity for the development of northern ports to take advantage of this.
Communities, health, wellbeing
• coastal communities are suffering from the effects of industrial decline, with high levels of transience and a decline in the availability of skilled employment • in the north west, fishing appears to be most important in Whitehaven (although it should be noted that this is the port into which catches are taken and not necessarily where boats are registered) and is important to a number of localised coastal communities • aquaculture is a growing marine activity and is seen as a means to increase seafood supplies and in turn increase employment • the north west and north east have an above national average proportion of people with a limiting long term illness • generally, there is often isolation of coastal towns due to lack of infrastructure. There is high tourism employment dependency across all plan areas.

Key Sustainability Baseline, Issues and Characteristics of the North West Marine Plan Areas
Economy
• ports play a significant role in domestic freight transport through coastal shipping (including transhipment), and links with Northern Ireland • the greatest risk of introducing disease comes from the movements of live shellfish. Presently seed mussels are fished in the marine plan areas and re-laid in the Walney channel (also within the marine plan area) or areas such as the Menai Strait (within Wales) and Northern Ireland (outside of the marine plan area). There are movements of live Pacific oysters to aquaculture areas within the marine plan area, where spat are on-grown on frames. If a disease outbreak occurred in an aquaculture area, there could be vast environmental impacts should the disease spread • fishing activity is sensitive to changes in other sea uses. Marine developments have the potential to prevent, displace or encourage fishing activities • under climate change scenarios sea temperature rise, ocean acidification, changes in fluvial flows (particularly in estuarine nursery grounds) and ocean currents may lead to a decrease in abundance, survival and growth of some exploitable fish species and an increase in abundance, survival and growth of invasive non-native pest species • modelling Marine Recreation Potential in England 2014 (MMO1064) showed a high potential for both wildlife watching potential and windsurfing in Morecambe Bay • the sea can provide a variety of tourism and recreational opportunities. These will vary from area to area but will include visiting the beach, dog walking, and walking, pleasure boating, sailing, recreational diving (including diving on wrecks), sea angling, kayaking and surfing, as well as exploration of underwater and coastal heritage assets • with regards to industry in the coastal zone, the north west and north east inshore marine plan areas are particularly important • heavy manufacturing which has a coastal or estuarine location can potentially have a number of impacts on the environment and impacts on the water environment is a key one. Developments can have adverse effects on transitional waters, coastal waters and marine waters. During the construction, operation and decommissioning phases of developments, there can be increased demand for water, discharges to water and adverse ecological effects resulting from physical modifications to the water environment • defence activities that utilise the marine environment, directly or indirectly, in support of operational capability are diverse but include operational vessels and aircraft, HM Naval bases, surface and sub-surface navigational interests, underwater acoustic ranges, maritime exercises, amphibious exercises, coastal training ranges and coastal test and evaluation ranges • 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 • there is one marine aggregate licence area located within the north west marine plan areas, namely Liverpool Bay

Key Sustainability Baseline, Issues and Characteristics of the North West Marine Plan Areas
• there is a planned subsea cable which will go under Morecambe Bay (and under or around the Duddon Estuary) as part of the North West Coastal Connections project to connect the planned nuclear power plant at Moorside to the National Grid at Heysham.
Biodiversity, Flora and Fauna
• invasive non-native leathery sea squirts and orange sheath tunicates are present within the north west and south west. The impacts of the former are currently uncertain, but it is recognised that they can become the dominant species, but can also provide secondary substrate for others • evidence of climate change has been recorded with species previously found further south becoming more common within the north west e.g. Black seabream, John Dory and anchovy. This may affect predator prey interactions, competition, reproduction/timing with population impacts. The magnitude of such impacts is uncertain at present • disturbance or shift in the range of native species due to habitat loss through sea level rise and coastal squeeze and storm events linked to climate change • Liverpool Bay and Morecambe Bay and Duddon Estuary have been classified as SPAs, the former having had its boundary extended in 2017. The Solway Firth has been proposed as a new SPA • there are significant wild shellfish beds and spawning and nursery areas for fish within the marine plan areas and in the Irish Sea as a whole. These should be considered in planning and could be protected or enhanced for important associated industries • the north west marine plan areas have been targeted for further development of offshore wind, and oil and gas activities, with a risk of disturbance and displacement to the movement of species through the area. This is particularly relevant to the movement of wintering and passage waders, seaducks and terns • impacts on subtidal sediments from offshore industry (e.g. aggregate extraction, dredging, and offshore energy production) is an issue for the north east, south east and north west plan areas. At various locations near large ports, subtidal rocky habitat has been lost due to the provision of infrastructure (mainly coastal), other construction or via smothering from dredged deposits. • in the UK, new fishing opportunities could arise due to increased abundances of warm-water species (e.g. red mullet), while cold adapted species (e.g. cod) may move northward or decline in their abundance within UK waters. Ocean acidification could also damage shellfish stocks.

4. How the assessment was undertaken

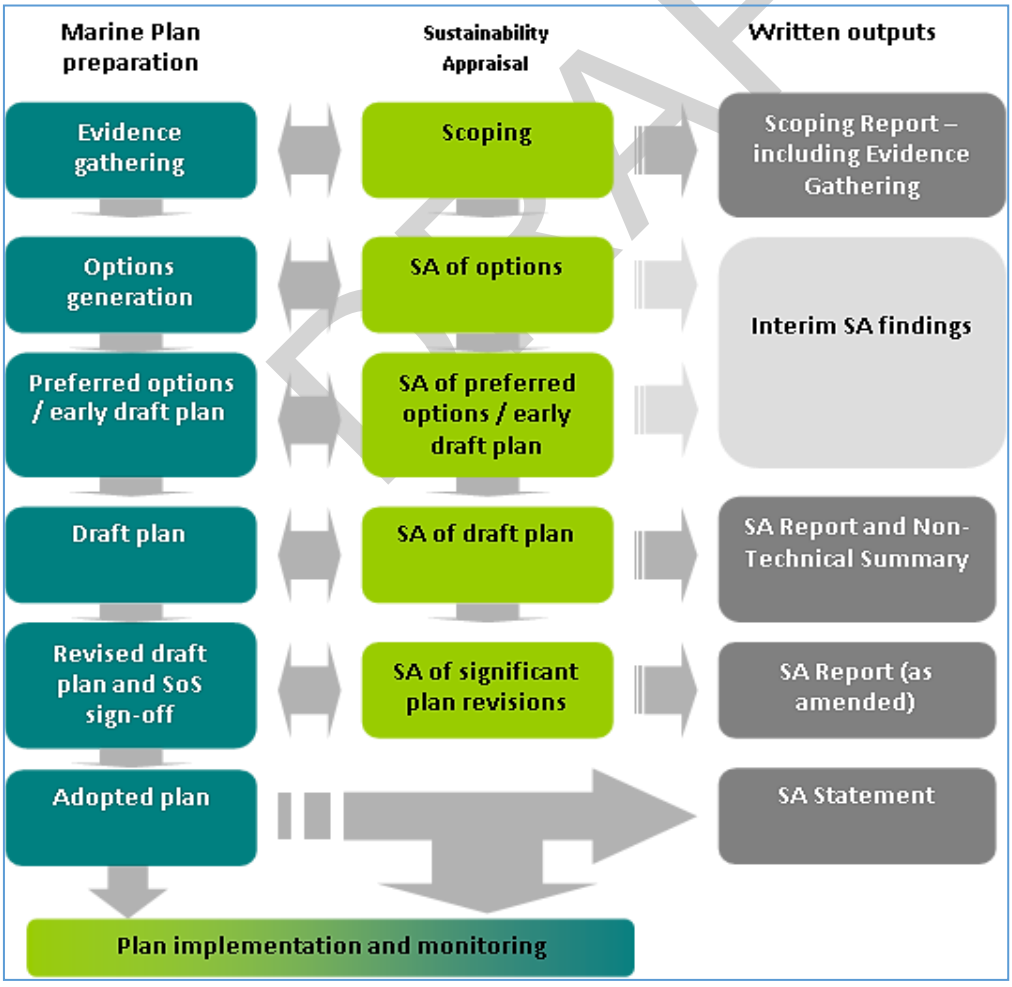
4.1. The SA process

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 West Marine Plan and assessing any significant changes
- Stage E: monitoring the significant effects of implementing the North West Marine Plan.

In practice, the SA is an iterative process which has been undertaken in parallel with the development of the North West Marine Plan and has fed into the development of the North West 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 West 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 West Marine Plan includes the north west inshore and the north west offshore marine plan areas. The north west inshore marine plan area covers an area of approximately 1,280 kilometres of coastline stretching from the Solway Firth border with Scotland to the River Dee border with Wales, taking in a total of approximately 4,900 square kilometres of sea. The north west 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 2,200 square kilometres of sea.

Temporal: The North West 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	• heritage assets within marine plan areas • heritage assets adjacent to marine plan areas.
	Geology, Substrates and Coastal Processes	• seabed substrates and bathymetry • coastal features and processes.
	Seascape and Landscape	• effects on seascape and landscape.
	Water	• tides and currents • water temperature and salinity • pollution and water quality • marine litter.
	Air Quality	• air pollutants.
	Climate	• greenhouse gas emissions • climate change resilience and adaptation.
Social and Economic Aspects	Communities, Health and Wellbeing	• health and wider determinants of health and effects on communities • effects on protected equality groups.
	Economy	• 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	• 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 West 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 groupings[4], 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 West 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 West Marine Plan preferred policies has been undertaken as a 'baseline-led' assessment which considers how the baseline situation will change with the North West Marine Plan in place. This is shown in Part 3 of the North West 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 West 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 West Policy Groupings.

North West Policy Groupings		
Economic:	**Environmental:**	**Social:**
Aggregates	Air Quality	Access
Co-Existence	Climate Change	Fisheries
Ports and Harbours (including shipping)	Marine Litter	Defence
Aquaculture	Biodiversity	Cross-Boundary Considerations
Dredging and Disposal	Cumulative Effects	Seascape and Landscape
Renewables	Marine Protected Areas	Tourism and Recreation
Cables	Natural Capital	Social Benefits
Oil and Gas	Disturbance	Employment
	Invasive Non-Native Species	Heritage Assets
	Underwater Noise	Infrastructure
	Water Quality	

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 West 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.
?	**Uncertain Effect:** It is not known whether the plan policies would lead to an improvement or deterioration in the baseline conditions[5].

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

Notation	Description
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.
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 West Marine Plan constitutes three parts:

- Part 1: Introduction and Methodology
- Part 2: Scoping Information
- Part 3: Results of 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 West Marine Plan and accompanying SA Report will be consulted on with the public and other key stakeholders in 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 West 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 West Marine Plan preferred policies by SA topic, the summaries of which are presented in the 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	++
• the north west inshore plan area is identified as having increased visitor numbers due to the quality of its heritage assets, it has also been identified as having underutilised heritage assets which could attract more visitors. The significance of heritage assets in the immediate vicinity of the north west marine plan areas, is susceptible to the impacts arising from activities within marine plan areas. This heritage asset policy aims to protect heritage assets from developments that could result in adverse effects.	
Significant Negative Effects	- -
• buried subsea cables have potential to disturb both known or undiscovered archaeological sites. The preference that this policy gives to bury cables has resulted in a significant negative effect on heritage assets within the marine plan areas and adjacent to it • the baseline has identified the significance of cultural heritage within the north west plan areas, particularly with regards to the Solway Coast and Hadrian's Wall. Oil, gas and carbon capture, usage and storage (CCUS) developments have the potential to adversely impact buried heritage assets. Policies NW-OG-1 and NW-OG-2 may not directly result in further oil and gas developments within the plan area, however, there are currently 23 licensed areas and 13 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 west contributes significantly to the UK overall supplies, it is assumed that these policies will ensure that development will continue, which could negatively impact heritage assets within the plan area • 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 aggregate extraction.	

Cultural Heritage	
Uncertain Effects	?
• there are currently no licensed aggregate extraction areas in the north west marine plan areas, however, there is one site located within the Irish Sea which 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, and for this reason an uncertain effect has been identified • 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. However, as the policy and supporting text do not stipulate whether potential activity will be undertaken or where it will take place, an uncertain effect has been identified • all marine renewable energy types have the potential to adversely affect heritage assets with the marine environment through their connection with the seabed, be this through the connection of the device itself with the seabed, such as the foot of a turbine or the anchoring of a wave device, or through contact between any heritage asset and the cable which lays across the seabed to take the energy onshore. The extent of these effects are largely dependent on the device used, and on the installation methods opted for.	

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

Geology, Substrates and Coastal Processes	
Significant Positive Effects	++
• 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 the natural capital policy, it is assumed that seabed substrates and bathymetry would be offered protection, due to the importance of these assets.	
Significant Negative Effects	- -
• 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. Increased dredging activity may occur as a result of dredging polices as well as	

Geology, Substrates and Coastal Processes	
the ports and shipping policies, therefore a significant negative effect on the seabed substrate and bathymetry SA sub-topic has been identified.	
Uncertain Effects	**?**
• 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 west marine plan areas, however, there is one site located within the Irish Sea which 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, and for this reason an uncertain effect has been identified • 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	++
• 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 west marine plan areas. Proposals which may harm the current seascape or landscape must demonstrate why this is necessary and mitigate adverse effects.	
Significant Negative Effects	- -
• 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 Lake District National Park and Solway Coast and Arnside and Silverdale AONBs, if development were to come forward, there is potential for significant negative effects. Although the oil and gas policies may not directly result in further oil and gas developments within the plan area, there are currently 23 licensed areas and 13 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 west contributes significantly to the UK overall supplies, it is assumed that these policies will ensure that development will continue, which could negatively impact seascape and landscape within the plan area • renewable energy developments have the potential to negatively affect the seabed and subsequent heritage assets. Within the plan areas there are three operational Round 1 sites (Barrow, Ormonde and Burbo Bank), three Round 2 sites (Walney 1, Walney 2 and West of Duddon Sands) and three extensions (Burbo Bank, Walney 3 and Walney 4).	
Uncertain Effects	?
• the potential effect which may be had on seascapes and landscapes by this policy is uncertain at present and dependent on its implementation. Seascapes and landscapes are vulnerable to adverse and cumulative effects from multiple sectors and/or activities. 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	**++**
• 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 west 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 an increase in 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	**- -**
• marine litter is a prevalent issue across the north west 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 • shipping can negatively impact water quality through the possible discharges from ships such as bilge water, ballast water, sewage and other residues in a ship. Spills of oils, lubricants, fuels and other oily liquids as well as marine litter can also be sources of water pollution from both ports and ships. As the ports and harbours policy grouping could result in increased shipping activity, there is potential for increases for in marine litter and pollution, therefore these policies have resulted in significant negative effects for both the pollution and water quality and the marine litter SA sub-topics.	
Uncertain Effects	**?**
• increased levels of tourism have potential to negatively impact water quality and increase marine litter within the north west 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 • densities of marine litter have increased across the UK, since monitoring began in 1994. The tourism and recreation policy is likely to result in increased visitor numbers which could lead to further marine litter. An uncertain effect has been recorded as it is not clear what 'sustainable tourism and recreation activities' will entail.	

Table 9: Assessment results: Air Quality.

Air Quality	
Significant Positive Effects	++
• 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 air quality.	
Uncertain Effects	?
• 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 NW-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 NW-PS-1 and NW-PS-4, as they could have differing overall effects on air pollution.	

Table 10: Assessment results: Climate.

Climate	
Significant Positive Effects	++
• 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 • the marine protected areas policies have resulted in a significant positive on the climate change resilience and adaptation SA sub-topic, as the policies directly address the issue of climate change adaption, with clear preference for proposals which enhance the adaptability of marine protected areas to climate change • the renewables policies support energy generation by 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 • natural flood defences provide regulatory natural capital services. In the north west inshore plan area mudflats in the Solway, Morecambe and Ribble estuaries, play an important natural role in protecting the coast from flood events by reducing wave energy and buffering flood waters. Well-developed sand dune systems, such as those on Walney and Foulney Islands, act to stabilise sediments, therefore reducing coastal erosion. It is therefore assumed that as a result of the natural capital policy, natural flood defences in the inshore plan area will be protected, which in turn will provide climate change resilience • 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	?
• the air quality policy has the potential to 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 what is done about greenhouse gas emissions. Due to the lack of evidence on future scenarios an uncertain effect has been identified on the climate change resilience and adaptation SA sub-topic • 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 NW-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. Uncertain effects have therefore been identified in relation to the greenhouse gas emissions SA sub-topic • through safeguarding, the oil and gas policies could potentially result in oil and gas extraction within the north west marine plan areas, which could indirectly and directly result in an increase of greenhouse gas emissions, having a potentially significant negative effect on both climate change resilience and adaptation and the greenhouse gas emissions SA sub-topics. Conversely, policy NW-CCUS-1 have 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 these policies.	

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

Communities, Health and Wellbeing	
Significant Positive Effects	++
• the baseline has identified income and employment deprivation issues associated with coastal communities across the north west 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	
• 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 promote 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	**?**
• 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	**++**
• 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 • aggregate policies could result in further aggregate extraction in the north west 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 policies will help to enable further cable development within the marine plan areas, 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 • oil and gas policies support future oil and gas extraction within the north west marine plan areas. Significant positive effects have been identified in relation to the energy generation and infrastructure development SA sub-topic	

Economy	
• tourism and recreation policies aim 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.	
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 this policy grouping 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 the fisheries and aquaculture SA sub-topic, both of which are large sectors within the north west 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 • preference towards defence activity could see some recreational activity and new recreational proposals limited within the marine plan areas, and there is potential for issues with relation to access. Uncertainty on the tourism and leisure and recreation SA sub-topics have 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 • an uncertain effect has been identified on marine manufacturing in relation to the marine protected areas policy, due to the proximity of Barrow Port, Barrow-in-Furness to the Morecambe Bay Special Area of Conservation (SAC) and Morecambe Bay and Duddon Estuary Special Protection Areas (SPAs). The effects of this manufacturing facility on the MPA sites are currently unclear, and further monitoring of the habitats would be required to establish the interactions between these co-existing sites. • An uncertain effect has been recorded on the energy generation and infrastructure development SA sub-topic, due to the prevalence of both MPAs and existing energy generation industry within the marine plan areas. It is unclear how existing infrastructure, such as the gas terminal at Barrow-in-Furness would be dealt with under this policy. Therefore, an uncertain effect has been recorded	

Economy
• 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	++
• the implementation of the marine protected areas policies has the 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 marine protected areas policy grouping has the potential to result in a significant positive effect on birds. There are a high number of bird habitats within the marine plan areas, which should be protected by policy NW-MPA-1, as many are currently designated as MPA sites. For example, Liverpool Bay SPA, which supports around 50,000 wintering birds. Policies NW-MPA-2 and 3 should aid in ensuring changes in current habitats due to climate change are considered, with MPA boundaries adjusted accordingly • the cumulative effects policy grouping is predicted to have a significant positive effect on the benthic and intertidal environment and protected sites and species SA sub-topic, 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 marine plan areas. 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 west 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 west bird populations.	
Significant Negative Effects	- -
• the increased number of aquaculture facilities which could result from the aquaculture policies, may have potential 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 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 • 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 areas	

Biodiversity, Habitats, Flora and Fauna	
• noise impacts from marine dredging are already having an impact on marine megafauna within the marine plan area. 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 fish and shellfish. Policies in this grouping could lead to the development of proposals which directly alter fish movement 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 west plan areas, 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. Disturbance may also be caused to benthic and intertidal species as well as protected sites and species.	
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 west marine plan areas, however, there is one site located within the Irish Sea which 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 • the potential effect on marine megafauna by the natural capital policy is uncertain at present and dependent on its implementation. Marine megafauna provides natural capital through, for example, eco-tourism and wildlife tours. However, these activities have been identified as having potential negative effects on marine megafauna. In addition, other sectors which make use of seismic surveys, piling, dredging, defence and shipping can also have negative effects on marine megafauna whilst	

Biodiversity, Habitats, Flora and Fauna
themselves relying on marine natural capital. It is therefore unclear which natural capital asset, and which sector's exploitation of such an asset, would be prioritised through the implementation of this policy • 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 within multiple plan areas • 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 • sewerage pollution remains a significant challenge for fish and shellfish within the north west plan areas. It is beyond the jurisdiction of the plan to look at existing issues within the plan area, therefore, it is not clear whether the water quality policy will help to tackle this existing issue. For these reasons. an uncertain effect has been identified on the fish and shellfish SA sub-topic • the disturbance policy does not protect benthic or intertidal habitats; or sessile species from the effects of disturbance, which could lead to the irreversible loss of benthic and intertidal environments within this plan area • it is unclear if invasive non-native species will be given the same protection as native species from disturbance, as described in policy SW-DIST-1. For this reason, an uncertain effect has been recorded • 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 • indirect positive effects may be had on plankton through renewable energy generation indirectly reducing the effects of climate change, such as changes to water temperature and salinity, and through having the potential to minimise demand on fossil fuel generated energy which could in turn minimise emissions and subsequent ocean acidification. There is however a lack of data on how or whether marine devices can have an adverse effect on plankton. During the construction, operation and decommissioning phases of developments, there can be increased demand for water, discharges to water and adverse ecological effects resulting from physical modifications to the water environment. For this reason, an uncertain effect has been identified in relation to the renewables policy on the plankton SA sub-topic.

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 West 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 West 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	NW-AGG-1, NW-AGG-2 and NW-AGG-3 NW-AIR-1 NW-AQ-1 and NW-AQ-2 NW-BIO-1, NW-BIO-2 and NW-BIO-3 NW-NG-1 NW-CO-1 NW-DEF-1 NW-DIST-1 NW-HER-1 NW-FISH-1 NW-ML-1 and NW-ML-2	NW-MPA-1, NW-MPA-2 and NW-MPA-4 NW-OG-1 and NW-OG-2 NW-PS-1 NW-REN-1 NW-SCP-1 NW-TR-1 NW-UWN-1 and NW-UWN-2 NW-WQ-1
Changes to policy wording	NW-BIO-2 NW-FISH-1, NW-FISH-2 and NW-FISH-3 NW-ML-1 and NW-ML-2 NW-MPA-4 NW-UWN-1 and NW-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 West Marine Plan may interact to cause cumulative effects on a receptor
- how the North West 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 West Inshore and Offshore Marine Plan SA Report.

Table 15: Summary of significant effects.

SA topic	Associated Policy Groupings	Negative Cumulative Effect	Potential positive cumulative effects
Cultural Heritage	**Negative cumulative effects:** aggregates cables dredging and disposal infrastructure oil and gas renewables shipping and ports. **Positive cumulative effects:** seascape and landscape heritage assets.	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.	The seascape and landscape policy grouping working in combination with the heritage assets policy grouping could result in positive cumulative effects.
Geology, Substrates and Coastal Processes	**Negative cumulative effects:** aggregates dredging and disposal co-existence.	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. The co-existence policy could result in a number of new developments coming forward within the marine plan area. If multiple developments came forward,	N/A

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	**Negative cumulative effects:** aggregates cables infrastructure oil and gas renewables. **Positive cumulative effects:** seascape and landscape heritage Assets marine protected areas.	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	**Negative cumulative effects:** aquaculture co-existence fisheries marine litter oil and gas ports and harbours tourism and recreation. **Positive cumulative effects:** biodiversity marine litter seascape and landscape.	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 (ego 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	**Negative cumulative effects:** access aggregates cables climate change disturbance dredging and disposal fisheries oil and gas ports and harbours tourism and recreation renewables. **Positive cumulative effects:** marine protected areas biodiversity fish and shellfish.	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. 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.	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. 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.

6.1 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 West 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 NW-CE-1
- Natural Capital Policy NW-NG-1
- Co-existence Policy NW-CO-1
- Cross-boundary considerations Policy NW-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 West Marine Plan as part of the SA, and as part of the implementation and monitoring of the adopted North West Marine Plan, should help to:

- monitor the significant effects of the draft North West Marine Plan
- track whether the North West 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 West 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 West 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.