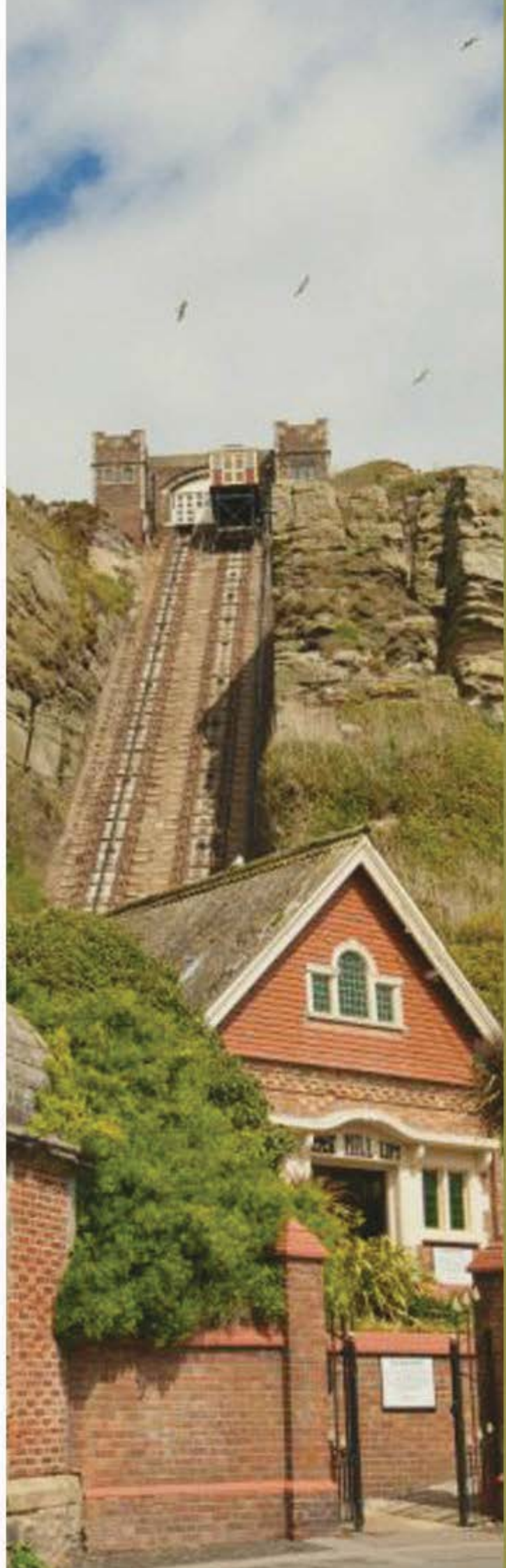




Marine Management Organisation

**Method and data
to monitor the
social outcomes
of marine plans**

July 2014



Method and Data to Monitor the Social Outcomes of Marine Plans

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Monitoring social outcomes of marine plans

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Executive Summary

The research objective was to identify the indicators that are relevant to monitor the social outcomes of marine plans and to ascertain the data requirements. The purpose is to provide a framework for monitoring marine plans against the social pillar of sustainable development, which can be used (in combination with economic and environmental monitoring) to report on the impact of marine planning and update and amend marine plans in the future. In this sense, when combined with other monitoring (e.g. of the environmental and economic pillars, and of implementation processes), it will aid MMO to satisfy their legal monitoring duties under the Marine and Coastal Access Act (MCAA) 2009. MMO has a duty to monitor and report on:

- The effects of the policies in the marine plan
- The effectiveness of those policies in securing that the objectives for which the marine plan was prepared and adopted are met
- The progress being made towards securing those objectives
- The contribution of the marine plans to meeting the MPS objectives (MMO, 2013a).

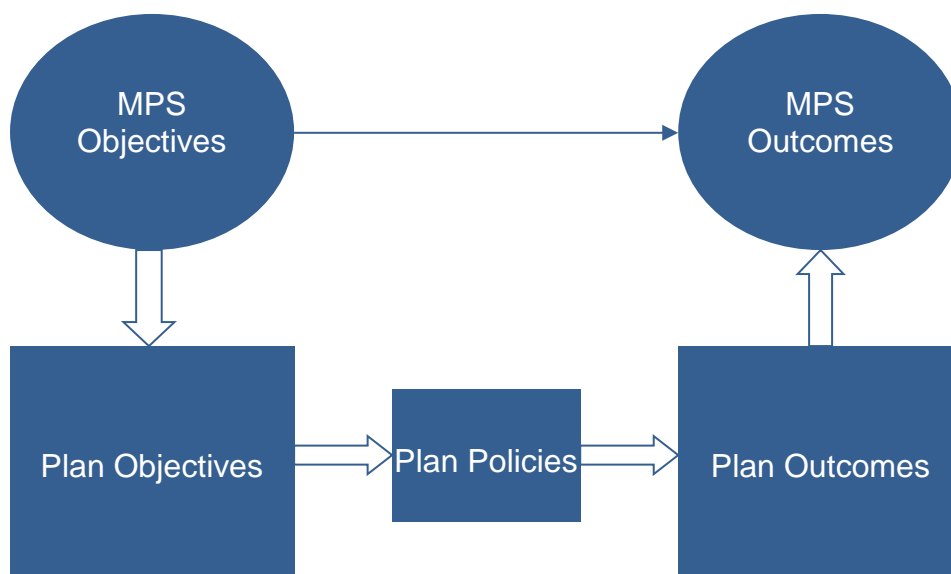
The UK Government's vision is for 'clean, healthy, safe, productive and biologically diverse oceans and seas' (UK Government, 2009). The marine plans interpret the 21 high level objectives of the UK vision, reconstructing them so that they reflect the *relative* priorities established at the local level.

A marine plan then sets specific policies which guide activity in order to deliver particular outcomes that relate to the plan objectives. As the plan objectives are derived from the Marine Policy Statement (MPS) objectives, these plan level outcomes will also contribute to the delivery of the desired outcomes for the MPS objectives. This process is depicted in Figure 1.

This research project was focussed on the 'social' outcomes of marine plans. There is no single definition of what should constitute the social domain. A focused approach, which lends itself to clear monitoring and indicator selection, is one that defines social impact through a two-staged process. The **first** stage is based on the recognition that social impacts arise when an individual, or group of individuals (i.e. household or family) are affected in their degree of **access** to something. The **second** stage is then to define the 'something'. A comprehensive classification that seems appropriate for use in relation to marine planning is:

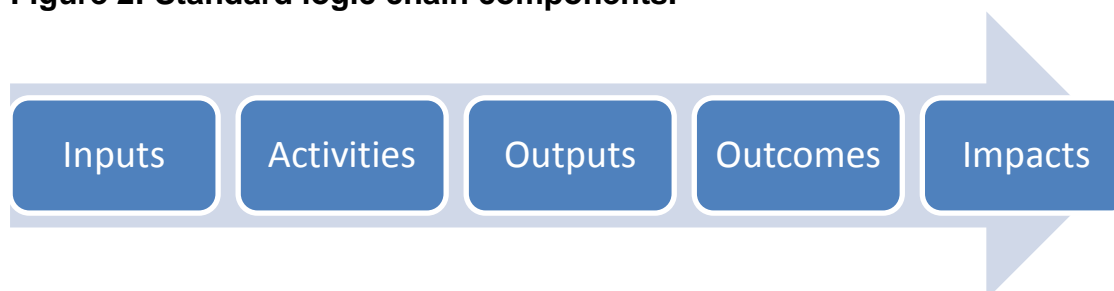
- Local economy and labour market
- Environmental amenity
- Health, safety and education
- Community cohesion
- Governance.

Figure 1: Relationship between MPS and Plan level objectives and outcomes.



A key starting point in developing the framework is to define the **pathways** by which plan policies can contribute to sustainable development and the nature of the economic, social and environmental outcomes and impacts that will arise. The pathways should reflect a **'theory of change'**. That is, how do the activities that the plan allows or encourages, affect the local economy and its people and thus achieve the plan objectives. The next step is to outline the **'logic chain'** that spells out inputs, activities, outputs, outcomes and impacts as they relate the plan objectives and policies. The components of a logic chain are shown in Figure 2.

Figure 2: Standard logic chain components.



We applied the framework by undertaking an analysis of the East Inshore and East Offshore Marine Plans (henceforth East Plans), which are the first (and currently only) English marine plans¹. The logic models were designed to show how the policies of the East Plans deliver impacts in line with the objectives. There are explicit crossovers and references to social issues under each of the social, environmental and economic themed objectives. As such, it is appropriate to establish economic-based, environment-based and social-based logic chains in order to appropriately monitor the social impacts of the East Plans.

¹ Whilst the East Plans cover two plan areas, it should be noted that they are presented as a single plan document with a shared set of objectives and policies. Hence there is no distinction between the two plans in this research report.

Following construction of the logic chains, summary social outcomes were mapped across from the objectives of the East Plans to the social outcomes types. Through a scoping exercise of relevant datasets, potential indicator types were identified from the available data, guided by the summarised social outcomes (and outputs where appropriate). A short-list of indicators were subject to a more detailed appraisal to establish their suitability for inclusion in the monitoring framework and a final list taken forward to the monitoring framework, bundled under the following categories:

- Employment-based indicators
- Labour market indicators
- Deprivation-based indicators
- Coastal visit-based indicators.

The indicators identified are listed below. Whilst it has been necessary to use the East Plans as the basis for the logic chain and indicator design, the East Plans' objectives should be considered as typical of the broad objectives that marine plans will contain given that they are reflective of the MPS objectives. As such the indicators are likely to be relevant for all marine plans. It is suggested that the indicators be utilised alongside relevant economic and environmental indicators to both provide context and overcome certain limitations of the indicators.

- Marine sector employment
- Marine sector employment as a proportion of total coastal community employment
- Coastal community employment deprivation
- Coastal community employment rate
- Coastal community income deprivation
- Number of recreation visits to the coast
- Number of recreation visits to the coast
- Health deprivation
- (Subjective) mental health benefits of visiting the coast
- (Subjective) learning about the natural environment during visits to the coast
- Coastal community multiple deprivation.

Each of the indicators identified can be constructed: (1) for local coastal community areas, covering the whole of the coastal community of a plan area, or for a number of spatially explicit coastal communities in a plan area, depending on the broader structure of the plan and its individual monitoring framework; and (2) at a national level, covering the whole of England or the UK, and for the combined coastal communities of all plan areas. As such, the performance of individual plan areas (and subareas) can be contrasted and summed to develop a national picture of performance.

For each marine plan(s) it is proposed that an Evaluation Plan be established that details the steps that would be taken to assess the effectiveness of the plan process in relation to the attainment of social objectives. It is recognised that there are advantages in the plan addressing the effectiveness of marine planning across the social, economic and environmental objectives because of the interfaces that exist between the three pillars. This Report highlights some of the key issues that should be considered in devising an appropriate methodology with which to assess the overall effectiveness of marine planning activity.

1. Introduction

1.1 Project aim

The research objective was to identify the indicators that are relevant to monitor the social outcomes of marine plans and to ascertain the data requirements. The purpose is to provide a framework for monitoring marine plans against the social pillar of sustainable development, which can be used (in combination with economic and environmental monitoring) to report on the impact of marine planning and update and amend marine plans in the future. In this sense, when combined with other monitoring (e.g. of the environmental and economic pillars, and of implementation processes), it will aid MMO to satisfy their legal monitoring duties under the Marine and Coastal Access Act (MCAA) 2009.

This report sets out a framework that ties together the Marine Policy Statement (MPS) (HM Government, 2011a) objectives and marine plan objectives. It uses the East Inshore and East Offshore Plans² (henceforth East Plans) as an applied case. It establishes a series of logic chains which articulate how the policies of the East Plans will deliver on the objectives and identifies a series of indicators and data sources that can be utilised to monitor the social outputs and outcomes.

1.2 MMO's monitoring duties

It is important that the monitoring framework, methods and data are sufficient to satisfy MMO's monitoring duties. The process of monitoring and periodical reporting on the implementation of marine plans is a legal requirement under Section 61 of the MCAA. MMO has a duty to monitor and report on:

- a) The effects of the policies in the marine plan
- b) The effectiveness of those policies in securing that the marine plan objectives
- c) The progress being made towards securing those objectives
- d) The contribution of the marine plans to meeting the MPS objectives (MMO, 2013a).

The Department for Environment, Food and Rural Affairs (Defra) (2011a) recognises that monitoring can be a resource-intensive activity and therefore states that 'data collection should be kept to the minimum that is required to assess Plan performance' and that 'a proportionate approach should be taken' with regard to the number of indicators and frequency of data collection and reporting.

Given the above it is clear that there are three basic facets of the monitoring requirements in relation to understanding the social outcomes of marine plans:

- Monitoring to satisfy requirement a) (monitoring effects of the policies in the marine plan) needs an exploration of the range of potential social effects of marine plans

² Whilst the East Plans cover two plan areas, it should be noted that they are presented as a single plan document with a shared set of objectives and policies. Hence there is no distinction between the two plans in this research report.

Monitoring social outcomes of marine plans

- Monitoring to satisfy requirements of b) (effectiveness of those policies in securing that the marine plan objectives) and c) (progress being made towards securing those objectives) needs consideration of those effects directly linked to the achievement of Plan objectives
- Monitoring to satisfy requirement d) (contribution of the marine plans to meeting the MPS objectives) needs consideration of the extent to which the social effects of marine plans are contributing to the objectives of the MPS. It does not require assessment of whether the MPS objectives are being achieved (MMO, 2013a).

This distinction is important in the context of this project, which is focussed on establishing a framework, methods and data for monitoring social outcomes that satisfies MMO's legal monitoring duties.

Understanding the extent to which objectives are being achieved would imply that an end point can be articulated, and ideally that points on the path towards that end can be identified and measured in relation to it. This generally requires the setting of targets for the objectives. Characteristics of good objectives are that they are Specific, Measurable, Achievable, Relevant, and Time-bound, i.e. SMART (Defra, 2011a). However, it is understood that such targets are not proposed as part of marine plans or the MPS.

The effectiveness of marine planning is the extent to which it achieves its objectives and if this is to be assessed it is necessary to disentangle the contribution of marine plan effects from other non-plan effects. This attribution process requires that marine plan 'impacts' can be appropriately defined and evaluated. The challenge of doing so is recognised by MMO and the outputs of this project, in relation to the adopted indicators and recommendations for further research and bespoke evaluation procedures.

2. Developing the Framework

2.1 How a plan delivers on its objectives

The plan involves setting a strategic direction for change in the planning period that reflects the **vision** for the plan areas and its **objectives**. The plan seeks to promote the wellbeing of people (their economic prosperity, health, access to good governance, access to quality services, etc.) and the place (its environment and the ecosystem in the broadest sense). The two are obviously linked and sustainable development requires them to be in balance. Plan **policies** guide decision making processes under the plan to ensure that the activities that are encouraged, discouraged or influenced are in line with the vision and objectives of the plan. Plan **instruments** are the tools used to encourage or discourage actions in line with the plan policies.

Thus, the plan establishes the strategic direction for a plan area. Through its objectives and policies it provides the guidance by which decisions can be made strategically, in a way that shapes the plan area according to the plan vision. As the vision and objectives are, in turn, aligned with the MPS, this ensures that decisions made within a plan area contribute to the delivery of the overarching vision for the UK marine area. It should be noted that the plan does not provide the only set of policies for marine activities. A broad number of existing policies and regulatory measures are already in place which direct how and where activities are undertaken. The plan seeks to complement these, either reaffirming existing policies and regulations, or augmenting them through the creation of new policies in order to provide new or improved direction.

The policies and objectives of a plan should 'control and influence, to varying degrees, the form, scale, timeframe and location of designations, uses and developments' (Defra, 2011a). They do not establish any delivery mechanisms (i.e. instruments) by which to achieve plan objectives. Rather, plans will be implemented through the use of existing regulatory and non-regulatory decision-making mechanisms. Even those under control of MMO such as marine licensing are empowered by legislation such as the MCAA, not marine plans.

There are three fundamental mechanisms through which implementation can take place:

- *“Regulation:* including interventions by the Government or public bodies on the grounds of public policy interest, for example, byelaws created by IFCA [Inshore Fisheries and Conservation Authorities]
- *Management:* of the existing assets of the plan area, including through the licensing and enforcement regime as well as physical interventions
- *Investment:* in selected interventions (this can also include the prevention of interventions, including, for example, preventing inappropriate development within an MCZ [marine conservation zone]).” (Defra, 2011a, p.38).

Section 58, in chapter 4 of the MCAA states that Public Authorities 'must take authorisation and enforcement decisions in accordance with the appropriate marine policy documents, unless relevant considerations indicate otherwise'. Authorisation

decisions are defined as any ‘approval, confirmation, consent, licence, permission or other authorisation (however described), whether specific or general’, with enforcement decisions defined in association with these. For decisions outside of this scope that may impact on the marine area, the Public Authority must ‘have regard’ to the appropriate marine policy documents. The introduction of the MPS and marine plans thus influence the decision making of the Public Authorities who utilise them. These decisions determine the form, scale, timeframe and location of designations, uses and developments in line with the policies. Decisions taken through each of the mechanisms described above will have to be in line with, or perform certain duties in line with other UK and EU obligations e.g. the Water Framework Directive (WFD), Environmental Impact Assessment (EIA) Directive and Marine Strategy Framework Directive (MSFD). For example, the presence of a marine plan will not alter the criteria on which the need for an EIA is established. Implementation of marine plan policies and objectives rests not just with MMO.

2.2 Linking the Marine Policy Statement with marine plans

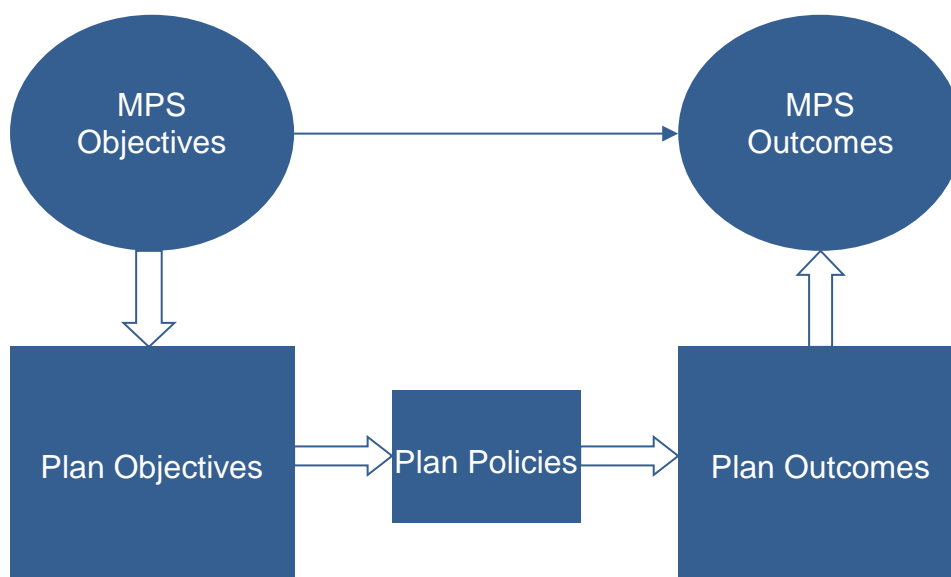
The UK Government’s vision is for ‘clean, healthy, safe, productive and biologically diverse oceans and seas’ (UK Government, 2009). There are 21 high level objectives which articulate this vision. These objectives are reaffirmed in the MPS. They reflect a combined set of objectives for both the vision and all policies (not just marine plan policies) in the marine area (HM Government, 2009). The Government recognises that sustainable development may often require trade-offs between economic, environmental and social objectives. To explicitly recognise this, the High Level Marine Objectives are set out under five themes that reflect the principles of sustainable development:

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

The marine plans interpret those high level MPS objectives for a plan area, reconstructing them so that they reflect the *relative* priorities established at the local level. These plan level objectives are similarly set out under the five principles of sustainable development.

A marine plan sets specific policies which guide activity in order to deliver particular outcomes that relate to the plan objectives. As the plan objectives are derived from the MPS objectives, these plan level outcomes will also contribute to the delivery of the desired outcomes for the MPS objectives. This process is depicted in Figure 3.

Figure 3: Relationship between MPS and Plan level objectives and outcomes.



2.3 Defining the social domain

There is no single definition of what should constitute the social domain. MMO (2013b) adopted a broad definition used by the International Association for Impact Assessment (IAIA, 2003) where ‘social impacts are the effect an action, programme, activity, or policy has on a society, community, family or individual directly or indirectly’. A social impact is argued to be possible if change occurs to:

- How people work, play and interact
- Their culture system
- Their community
- Their political system
- Their environment
- Their health and wellbeing
- Their personal and property rights
- Their fears and aspiration.

A very broad interpretation would suggest that the social objectives set out in the MPS require that social impacts should be considered in virtually all of the above areas. Thus, the MPS social objectives are that:

- People appreciate the diversity of the marine environment, its seascapes, its natural and cultural heritage and its resources and act responsibly.
- The use of the marine environment is benefiting society as a whole, contributing to resilient and cohesive communities that can adapt to coastal erosion and flood risk, as well as contributing to physical and mental wellbeing.
- The coast, seas, oceans and their resources are safe to use.
- The marine environment plays an important role in mitigating climate change.

Monitoring social outcomes of marine plans

- There is equitable access for those who want to use and enjoy the coast, seas and their wide range of resources and assets and recognition that for some island and peripheral communities the sea plays a significant role in their community.
- Use of the marine environment will recognise, and integrate with, defence priorities, including the strengthening of international peace and stability and the defence of the UK and its interests.

Clearly, each plan will determine its own relative priorities across these social objectives, but on the basis of this list virtually all the changes that may come about as a result of a plan being implemented could be considered to have either a direct or indirect effect on the social dimension. A definition like this is drawing on the concept of social welfare in the broadest sense. The approach is similar to that of the UK Government which has recently begun to produce measures of wellbeing (Office for National Statistics (ONS), 2014).

A more focused approach, and one which lends itself more readily to a clear monitoring framework and indicator selection, is one that defines social impact through a two-staged process. The **first** stage is based on the recognition that social impacts arise when an individual, or group of individuals (i.e. household or family) are affected in their degree of **access** to something. The **second** stage is then to define the 'something'. One possible classification is provided by the Evaluation Partnership Report (2010) that points to at least five possibilities which covers the typical range of social impacts. These are:

- Employment (including the quality of a job as defined by the relevant labour market standards and rights)
- Income
- Services (including education, social services, etc.)
- Fundamental rights (say ability to vote)
- Public health, a safe environment and society.

These possibilities fit well with the social impacts that are relevant to the social objectives set-out in the MPS, but it would be useful to draw out environmental amenity and community cohesion. Thus, a comprehensive list which is appropriate for use in relation to marine planning would be access as it relates to:

- The local economy and the labour market
- Environmental amenity
- Health, safety and education
- Community cohesion
- Governance.

For the purposes of the present assignment it would seem helpful to adopt this broad categorisation. If this is done then many of the suggested elements can be translated fairly readily into relatively tightly bounded objectives and monitored using established indicators. However, it is particularly difficult to define and measure community cohesion, particularly as it relates to communities and change through time. There is a large literature on this. Measures relating to trust and interaction are

frequently used but can require extensive social surveying because evidence is not available through government administrative and secondary data sources.

It should be recognised that some issues of focus for social impact assessment are not explicitly stated in the above 5-point list. In such instances, the issues can be generally considered to occur as a combination of one or more of the above social impact types. Social inclusion or exclusion is normally understood as the result of a combination of many of the factors listed above. Similarly, deprivation is generally considered as a combination of factors (for example, see ONS indices of multiple deprivation).

It is also very difficult to assess improvements in governance and we return to this later in this report.

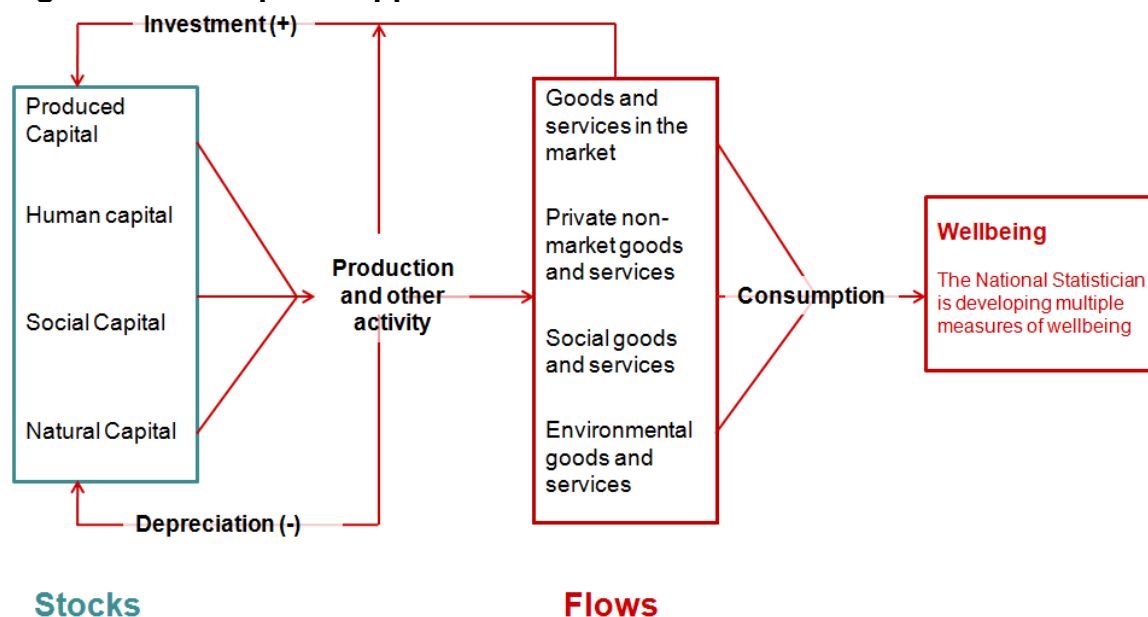
2.4 How a Marine Plan may impact on social objectives

The thinking in this section is grounded in the ‘capitals approach’ (Harper and Price, 2011). The capitals approach was adopted in the work of the GES/GSR Social Impacts Taskforce and provides a suitable conceptual framework for thinking about how marine plans create impacts. It aligns with MMO goals of adopting an ecosystem approach to marine planning and for resulting plans to help deliver sustainable development. The inclusion of capital stocks (produced capital, human capital, social capital, natural capital) as part of the ‘capitals approach’ is considered to be an operational way of incorporating sustainable development into policy appraisal and decision making (Price *et al.*, 2010). Further, its ‘stocks and flows’ design is directly linked to the language and concepts of natural capital and ecosystem services, consideration of which form an important principle of the ecosystem approach (MMO, in press a).

It is noted that the capitals approach does not explicitly provide for consideration of the distributional dimension of social impacts across society. As such in any given impact assessment, distributional analyses should be factored in. A flow diagram of the capitals approach is set out in Figure 4. Its components are discussed here in relation to marine planning.

The quality of life enjoyed by the population covered by a plan at its inception is determined by the **stock** of productive, human, social and natural **capital** that is available. Through the lifetime of the plan, its policies and instruments can encourage investment that enhances capital stocks and discourage activities (or aspects of them) that depreciate capital stocks. The **activities** that the plan enables provide a **flow** of marketed and non-marketed goods and services which generate economic, environmental and social impacts that combine to alter the general wellbeing of the relevant marine area (and its environment) and its people. The sorts of activities that marine plans enable are set out in the Marine Policy Statement and include among others: fishing, aquaculture, tourism and recreation.

Figure 4: The Capitals Approach.



Source: Harper and Price, 2011

With regards to Figure 4, all MPS sectors can be considered to be either productive or other forms of non-productive activity. These activities utilise a range of capital stock inputs (typically a mixture of the different types of capital) in order to generate flows of goods and services. Both the production and consumption of these goods and services can have economic, social and environmental impacts.

The flows of goods and services generated by these activities will change in response to the quantity and quality of the underlying capital stocks, as well as the scale and nature of the activities present. For example; an improvement in the stock of natural capital may increase the quality of services that flow from recreation activities; an investment in renewable energy installation as part of increased renewable energy activity may generate more economic output, income and jobs. Changes of this nature affect the ability of an individual or their family or community, to **access** (in terms of quantity and quality) services that enhance their welfare. There are important distributional issues in terms of **who** actually gains increased access since some benefits may go to local people, some who work in the area and live elsewhere and others to those people who visit the area and then leave, as in the case of tourists.

The activity that the plan enables has the potential to generate a wide range of social benefits and some of these may be as a direct result of the plan. However, in many cases benefits in the social domain come about because of improvements to the economy and the environment i.e. the social impacts are 'indirect'. An example is when new economic investment creates a new job that reduces local unemployment; or the management of an activity helps to improve the environment which in turn improves health and environmental amenity. Thus, it is important to recognise the **interactions** between the three pillars of environment, economy and social and the overall net effect on the social, economic and environmental objectives of relevance to the study area.

2.5 Developing a monitoring framework

In order to develop a monitoring framework which will be appropriate for all marine plans two key things are required. The first is a framework that articulates how plan activities link to MPS objectives and local plan-level objectives. This will allow the social objectives of plans to fit within one monitoring framework. Further, this will enable an explicit link to be made back to the objectives of the MPS to allow monitoring of marine planning in general (i.e. cumulative effect of all marine plans). The second is that we have an Evaluation Plan that outlines the key components of an evaluation logic chain that is in line with Government's Green Book and Magenta guidance (HM Treasury, 2011a and 2011b) and identifies the indicators that will be used to track the impact of the plan. The Evaluation Plan should also discuss issues of attribution and we discuss this later in this report.

A key starting point in developing the framework is to define the **pathways** by which plan policies can contribute to sustainable development and the nature of the economic, social and environmental outcomes and impacts that will arise. The pathways should reflect a '**theory of change**'. That is, how do the activities that the plan allows or encourages, affect the local economy and its people and thus achieve the objectives set out in the plan. The next step is to outline the '**logic chain**' that specifies the inputs, activities, outcomes, outputs and impacts as they relate to the plan objectives and policies.

The plan objectives should ideally be clear in terms of the **context** or **nature** of the specific issue being addressed. The **rationale** for intervention identifies why it is believed that in the absence of plan intervention the plan objectives will not be secured. The rationale for intervention is usually based on there being the presence of some form of market or institutional failure. In the ecosystem example because the natural capital assets are not correctly valued (or not valued at all) then society overexploits them. The **theory of change** specifies how it is felt that the intervention will overcome the market/institutional failures that are currently constraining the objective being attained. Thus, it should identify how the plan **policies** will guide the plan **instruments** to encourage/discourage activities that will be in line with the plan objectives.

Using the standard evaluation logic chain approach, we can define:

- **Inputs:** In the context of marine planning, these are the planning instruments that control activity so that the plan objectives can be achieved. In a plan context these instruments usually take the form of direct development control i.e. only land uses/sea uses of a specific form/type are allowed. Or they may relate to restrictions/regulations that control the quality and nature of development that is allowed, i.e. turbine height, or temporal restrictions on activity. The planning instruments are guided by the policies outlined in the plan. There can be other forms of plan inputs that are of a softer form (e.g. the provision of guidance, training and workshops to raise awareness of plans and how to use them, increased join up of decision makers and applicants and improved consultation) that will affect the effectiveness with which marine planning is delivered.

- **Activities:** the actions that arise as a result of the plan being implemented. They can be considered according to the marine/land uses that are encouraged i.e. environmental protection, tourism, recreation, energy generation/extraction, etc.
- **Outputs:** the benefits that plan actions provide to people, including visitors to a local area.
- **Outcomes:** the outputs will affect the social, economic and environmental characteristics of the area(s) affected by the plan and thus the welfare of the people that live and visit there. The changes in the relevant outcomes should be in line with the objectives of the Marine Plan.
- **Impact:** is the outcome change that is attributed to the plan. (The amount that the relevant outcome(s) has changed, relative to the baseline position, because of the plan being implemented).

It should be realised that each plan objective will impact on the social domain even if that is not immediately apparent in its statement. For example, Objective 6 of the East Plans seeks to maintain a 'healthy, resilient and adaptable marine ecosystem' and its direct impact is ecological/environmental. However, since in turn this can impact the welfare/health of local people there are implications for the social domain. There will thus be **direct** and **indirect** pathways to the attainment of social impacts associated with all objectives. A central issue is to establish which pathways generate **strong** impacts and which **weak** and the extent to which the pathways are understood and measurable.

A further issue is that there will also be **leakage** of impact across spatial areas so that the actions in the plan area may well have impacts in adjacent areas and vice-versa. A central issue is to establish the **boundaries** of the impacts arising from the plan. This is particularly important because some plan objectives seek to coordinate or harmonise impacts between the plan area and its surrounding areas. This is not straightforward. In some cases the beneficiaries involved may be readily identified because the geography of the plan activities is straight forward and there is thus a strong and direct relationship between the activities arising from the plan and those who benefit. In other cases, however, this relationship is weaker. For example the beneficiary population may only benefit from improvement in the quality of the place when they visit it, or pass through it on the way to somewhere else. It is important to establish the different groups of people who may benefit according to their socio-economic characteristics. In a similar vein it is also necessary to be clear about the duration and durability of the impacts that will arise.

3. Applying the Framework

3.1 Introduction

The framework was applied by undertaking an analysis of the East Plans, which are the first (and currently only) English marine plans. The 11 objectives stated in the East Plans are designed to reflect objectives in the MPS that are relevant to the local circumstances and the East Plans area. A number of supporting documents and literature were used to develop a series of logic models in line with Government guidance (HM Treasury, 2011a and 2011b).

The logic models were designed to show how plan policies deliver impacts across the social domain³ in line with plan objectives. This approach enables the identification of the relevant social outcomes to be monitored for each objective. Whilst they have been formulated with reference to the East Plans, they are presented as generically as possible to demonstrate the broader resonance for all marine plans.

As discussed in Section 2, there are explicit crossovers and references to social issues under each of the social, environmental and economic themed objectives. As such, it is appropriate to establish economic-based, environment-based and social-based logic chains in order to appropriately monitor the social impacts of the plan.

This section shows how the logic chain approach can be used to follow through how plans policies under each of these can deliver social outcomes that should be monitored. These are shown in Figures 6 to 9. Behind these summary logic chains, objective-specific logic chain analysis was undertaken for each objective, the outputs of which are shown in Annex A. In this section we also discuss the issues raised by plans having objectives that have social outcomes that relate to governance and overall institutional reform.

3.2 Society-based Logic Chains for the social domain

In the East Plans there are two social objectives that are directly concerned with generating social impacts. Objective 4 seeks to reduce deprivation and support vibrant, sustainable communities through improving health and social wellbeing. This objective aims to increase opportunities for activities that improve the health and wellbeing of local people, by recognising the importance of a healthy marine environment and biodiversity, providing access to marine-related recreational activities and ensuring that all people have equal opportunities to benefit from marine activities. The economic dimensions of reducing deprivation and supporting sustainable communities are addressed through Objectives 1, 2 and 3, and the environmental dimensions through Objectives 6, 7, 8 and 9. The East Plans are noted as having a role in realising social benefits including improving wellbeing of local people through improvements to lifestyle (healthier), increased affluence (disposable income due to employment opportunities from investment) and sense of pride and enjoyment from a healthy, diverse environment.

³ As defined in Section 2.3.

Objective 5 focuses on conserving heritage assets, nationally protected landscapes and ensuring that decisions consider the seascape of the local area. The East Plans state that the historic sites, landscapes and seascapes have great social value for present and future generations. Heritage assets are referred to as ‘those elements of the historic environment such as buildings, monuments, or landscapes that have been positively identified as holding a degree of significance’. The East Plans are thus in line with the recognition in the MPS that “some heritage assets have a level of interest that justifies statutory designation, the purpose of which is to ensure that they are protected and conserved...” English Heritage in relation to Rapid Coastal Zone Assessment Surveys, Historic Seascape Characterisation and other projects supported by the National Heritage Protection Plan is seeking to identify the extent of prehistoric sites and other aspects of the historic environment on coasts.

Both these objectives focus on enhancing social welfare by increasing access to the marine environment and its heritage. The logic chains in Figures 5 and 6 describe the context and rationale for the objectives. The plan instruments encourage activities that generate the relevant outputs. These outputs lead to social outcomes that are in line with the plan objectives. Examples of relevant outputs include more activities taking place at the coast that contributes to social improvement, improved quality of visits, increased use of amenity sites and improved quality of residential, commercial, recreational and heritage sites. A number of possible socially orientated outcomes are of relevance and include effect on visual amenity, community development (cohesion) and local economic growth (and thus worklessness⁴), as well as improvements to health. The impacts are those outcome effects attributable to the plan in the relevant period.

⁴ Worklessness is a broader concept than unemployment, including also those people who are economically inactive.

Figure 5: Society-based logic chain (Objective 4) for the social domain.

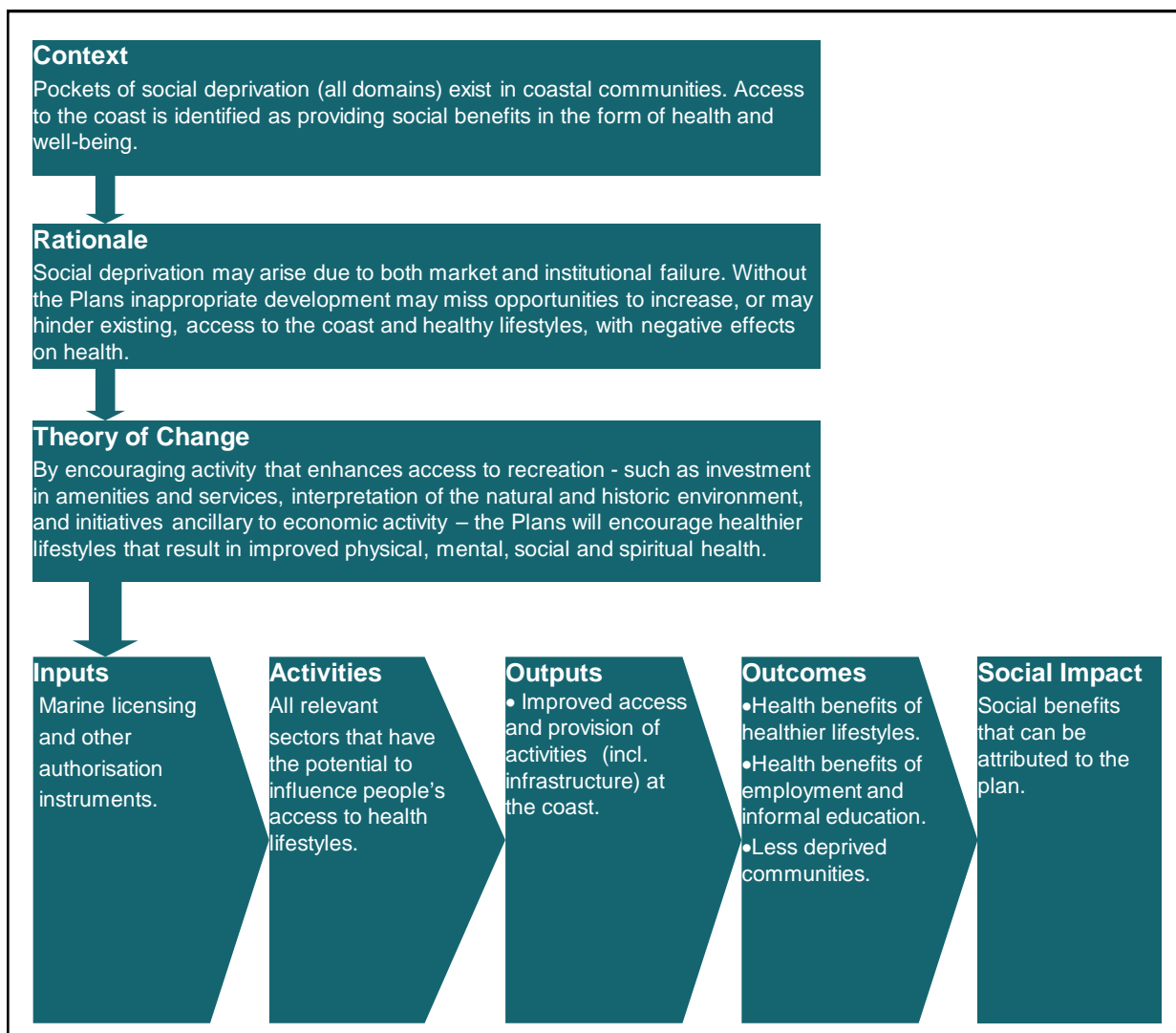
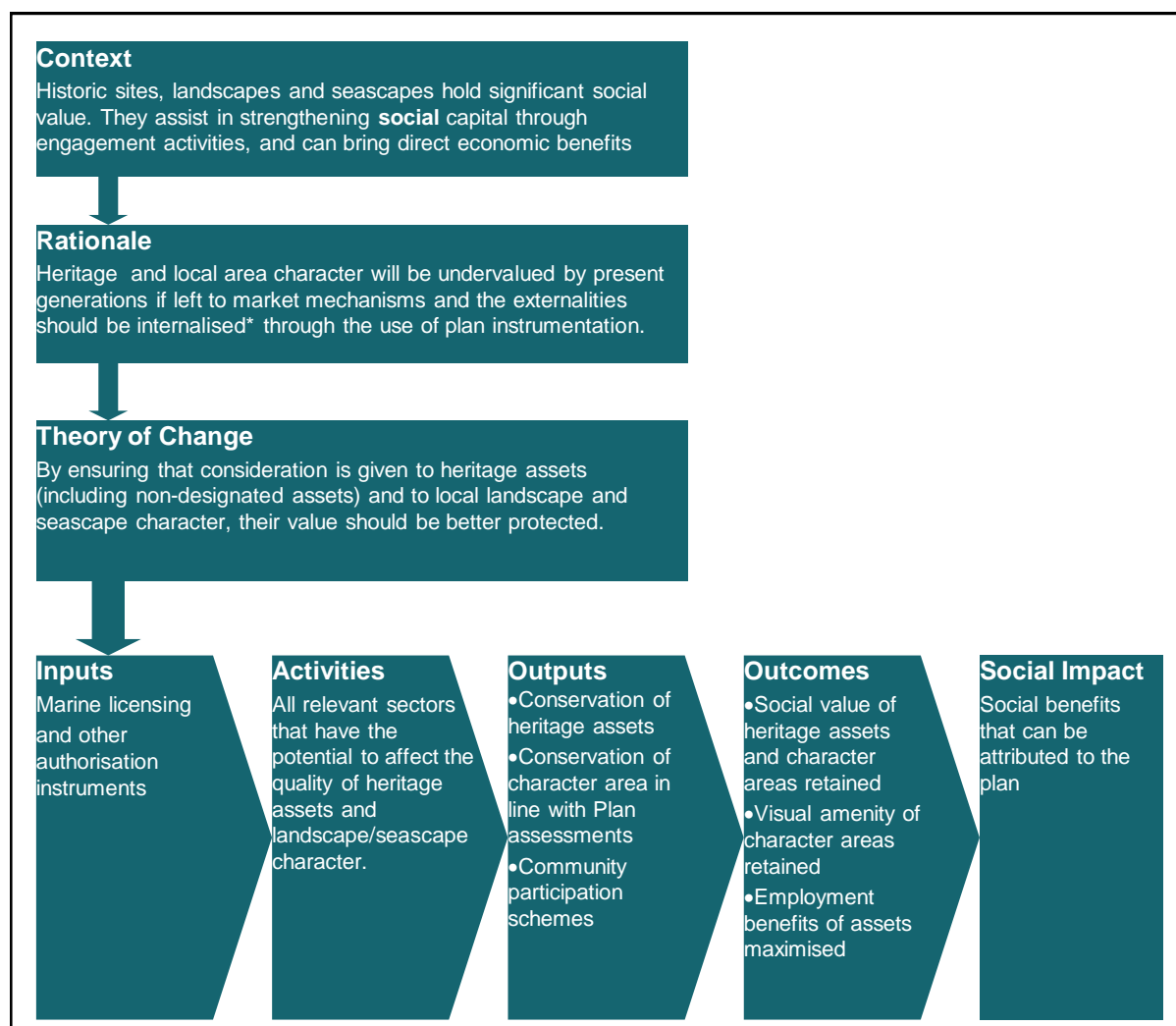


Figure 6: Society-based logic chain (Objective 5) for the social domain.



*Note this concept entails taking action to consider negative outcomes of activities that affect parties that did not choose to incur that cost.

3.3 Economy-based logic chain for the social domain

In the East Plans there are three objectives that are explicitly economic but which have the potential to generate social impacts.

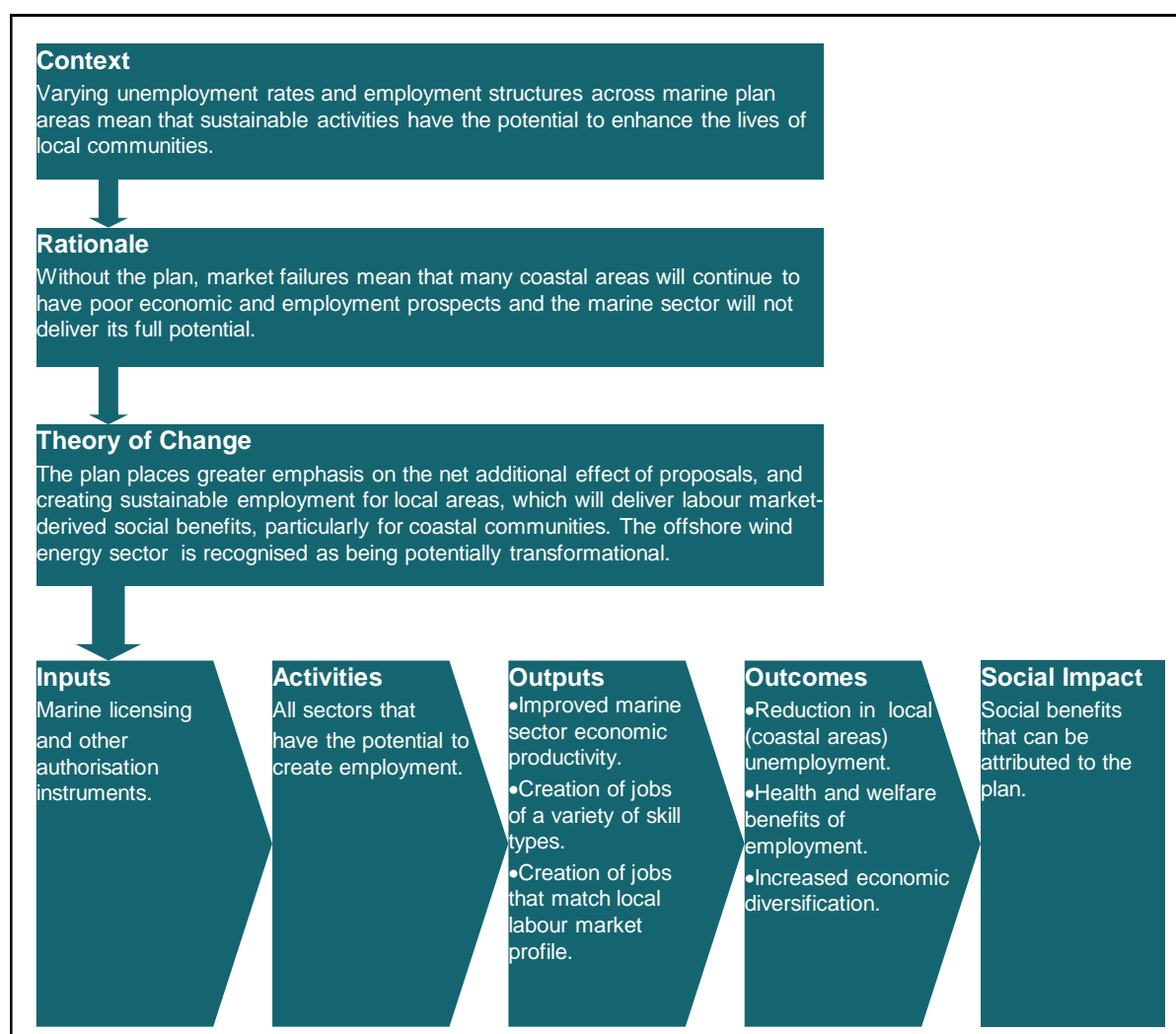
Objective 1 promotes the sustainable development of economically productive activities, while taking account of the spatial requirements of other activities of importance to the East Plan areas' economic productivity. Objective 2 supports activities that create employment at all skill levels, taking account of the spatial and other requirements of activities in the East Plan areas. Objective 3 aims to realise the potential of renewable energy, particularly offshore wind, which is likely to be the most significant transformational economic activity over the next 20 years in the East Plan areas, and will help to achieve the UK's energy security and carbon reduction objectives.

Marine activities input across a range of different sectors and geographic areas. Maintaining and growing the local and national economies through marine activities

provides jobs and income for local people and leads to the production of goods and services that add value locally, nationally and internationally. Many sectors of activity can be affected including logistics, automotive, retail and manufacturing.

The logic chain shown in Figure 6 indicates the broad context and rationale. It also illustrates the relevant outputs and outcomes. The extent to which plan outcomes have arisen as a result of the plan represents the plan’s overall impact. Examples of relevant outputs include jobs created and a number of other labour market related measures. Examples of possible social orientated outcomes relate to incomes, worklessness, gross value added (GVA) and human capital (through training and thus increased skill levels).

Figure 7: Economy-based logic chain for the social domain.



3.4 Environment-based Logic Chain for the social domain

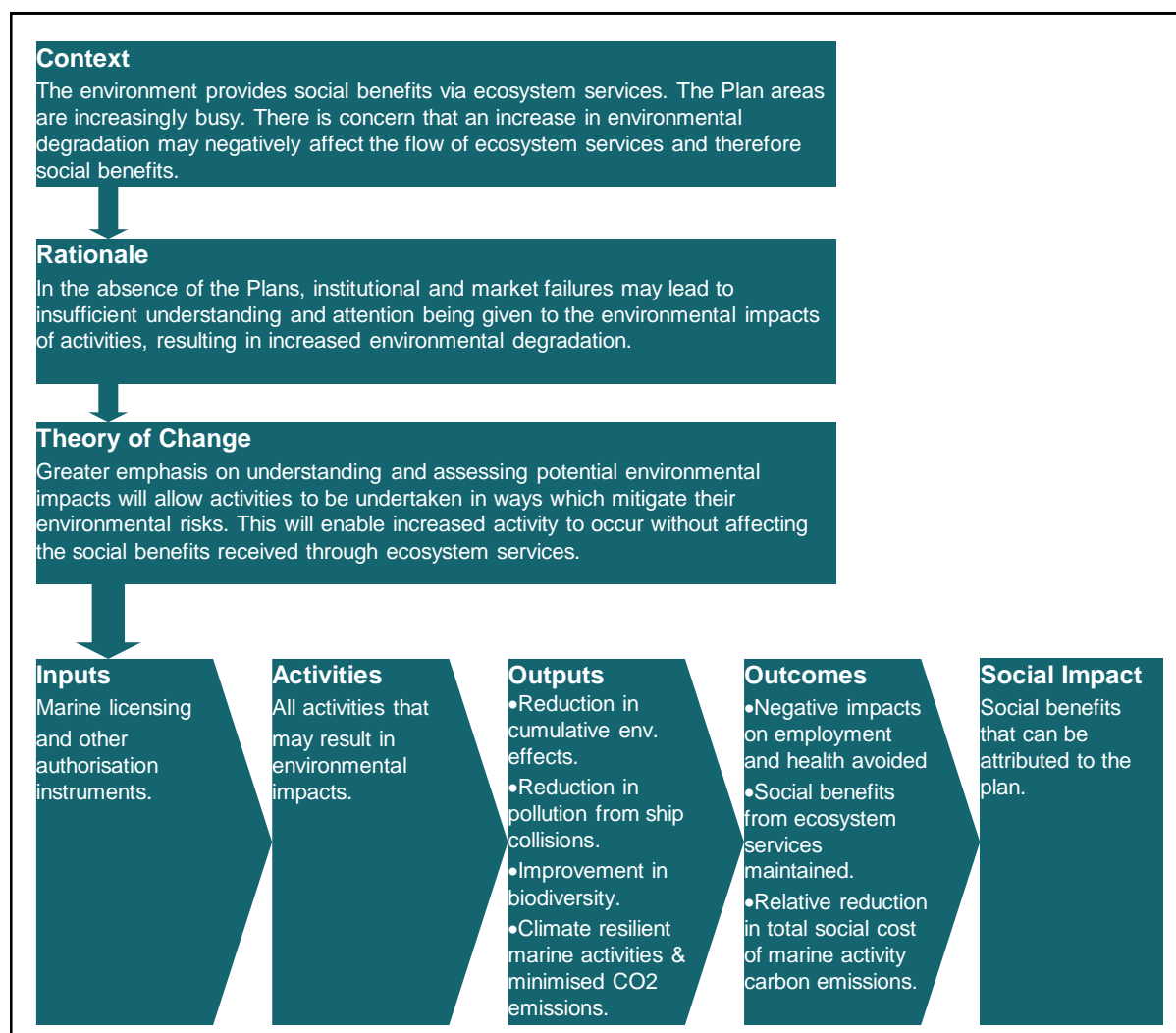
In the East Plans there are four objectives that are explicitly environmental but have the potential to generate social impacts. Objective 6 is concerned with ensuring a healthy, resilient and adaptable marine ecosystem in the East Plan areas. Objective 7 focuses on protecting, conserving and, where appropriate, recovering biodiversity

that is in or dependent upon the East Plan areas. Objective 8 aims to support the objectives of marine protected areas (and other designated sites around the coast that overlap, or are adjacent to the East Plans area), individually and as part of an ecologically coherent network and Objective 9 aims to facilitate action on climate change adaptation and mitigation in the East Plans area.

These objectives recognise that a healthy functioning ecosystem is important in its own right and that it should be resilient and adaptable in the face of pressures upon it, and able to sustain the benefits that it provides to people. The objectives reflect the need to prevent activities in the marine area from damaging the functioning of the marine ecosystem and avoid impacts accumulating through multiple activities taking place in a particular space. Delivery of the objectives should benefit both people and wildlife. The East Plans explain that the objective reflects elements of the ecosystem beyond specific biodiversity interests, with a focus on the ultimate benefits to people from ecosystem services that are provided by the fundamental stock of natural capital. With reference to our conceptual model of social impacts, the policy is focussed on ensuring that the depreciation of and investment in natural capital facilitated by MPAs is not undermined by a lack of consideration of network-level effects. In this sense the policy will help to ensure the social benefits arising from improved flows of ecosystem services.

Figure 7 illustrates the application of the logic chain approach and illustrates the thinking behind the context, rationale and deployment of the plan instruments. Relevant outputs of the activities encouraged by the East Plans include new/altered developments that include components that deliver environmental enhancement and avoid environmental degradation. Relevant outcomes relate to enhanced environmental amenity, improved health and a number of economically-derived impacts.

Figure 8: Environment-based logic chain for the social domain.



3.5 Considering issues relating to governance and enhanced policy delivery

Objective 10 of the East Plans seeks integration with other plans in the East Plan and adjacent plan areas. Objective 11 seeks to continue to build the marine evidence base to support development, monitoring and review of marine planning in the East Plan areas.

In both of these objectives the plan process is seeking to enhance the ability of the *whole* planning process to secure its objectives, social or otherwise. It is promoting better policy making in the broadest sense. This includes integrating and coordinating the work of local stakeholders to ensure that local needs and priorities, as they relate to social wellbeing, are addressed in the plan. Examples include enhanced sensitivity to identifying, tracking and charting social need and impact, securing more effective and efficient use of local resources and to ensure that marine planning delivers strategic added value.

3.6 Mapping East Plan Objective to Outcomes

Table 1 shows the result of mapping outcomes to objectives by outcome type. It provides a summary of the primary (in bold) and secondary (not in bold) social outcomes under each outcome type. It acts as both a simple guide for the indicator search and selection process (see Section 4), and as a useful tool to understand where multiple objectives are likely to contribute to the same outcomes and therefore utilise the same or similar indicators.

Clearly the mapping translates the objectives of the *East Plans* onto the relevant outcomes. However, as discussed earlier, these objectives should be considered as typical of the broad objectives that marine plans will contain given that they are reflective of what the higher MPS objectives seek. At the marine plan level it is the *relative* importance, and thus weight, given to each that is likely to vary, depending on local needs and thus priorities.

Table 1: Mapping objectives and outcomes of the East Plans.

	Social Outcome Types				
East Plans Objective	Economy & labour market	Environmental amenity	Health, safety & education	Community cohesion	Governance / cross-cutting
Economy-based					
1 Economic productivity	<ul style="list-style-type: none"> • Access to employment opportunities • Increase average incomes 		<ul style="list-style-type: none"> • Physical and mental health • Education and skills development 	<ul style="list-style-type: none"> • Employment derived cohesion 	
2 Employment and skill levels	<ul style="list-style-type: none"> • Diversify coastal economy • Diverse coastal occupation levels • Improved coastal income equality 		<ul style="list-style-type: none"> • Physical and mental health • Education and skills development 	<ul style="list-style-type: none"> • Employment derived cohesion 	
3 Wind energy as a transformational activity	<ul style="list-style-type: none"> • Access to employment opportunities • Increased coastal community average incomes 		<ul style="list-style-type: none"> • Physical and mental health • Education and skills development 	<ul style="list-style-type: none"> • Employment derived cohesion 	<ul style="list-style-type: none"> • Social benefit of avoided CO2e
Society-based					
4 Health and wellbeing	<ul style="list-style-type: none"> • Increase average incomes 	<ul style="list-style-type: none"> • Visitor amenity • Resident amenity • Non-use amenity 	<ul style="list-style-type: none"> • Physical and mental health • Education development 	<ul style="list-style-type: none"> • Activity derived cohesion 	
5 Heritage assets and seascape character	<ul style="list-style-type: none"> • Tourism and recreation employment 	<ul style="list-style-type: none"> • Visitor amenity • Resident amenity • Non-use amenity 	<ul style="list-style-type: none"> • Heritage-based education • Education and skills development • Physical and mental health (from recreation and employment) 	<ul style="list-style-type: none"> • Employment derived cohesion • Community event derived cohesion 	

Monitoring social outcomes of marine plans

	Social Outcome Types				
East Plans Objective	Economy & labour market	Environmental amenity	Health, safety & education	Community cohesion	Governance / cross-cutting
Environment-based					
6 Healthy ecosystems	<ul style="list-style-type: none"> • Commercial fishing, aquaculture, tourism and recreation employment 	<ul style="list-style-type: none"> • Visitor amenity • Resident amenity • Non-use amenity 	<ul style="list-style-type: none"> • Environment-based education • Physical and mental health (from recreation and employment) 	<ul style="list-style-type: none"> • Employment derived cohesion • Recreation event derived cohesion 	<ul style="list-style-type: none"> • Social benefit of avoided CO2e
7 Biodiversity	<ul style="list-style-type: none"> • As above 	<ul style="list-style-type: none"> • As above 	<ul style="list-style-type: none"> • As above 	<ul style="list-style-type: none"> • As above 	
8 MPAs	<ul style="list-style-type: none"> • As above 	<ul style="list-style-type: none"> • As above 	<ul style="list-style-type: none"> • As above 	<ul style="list-style-type: none"> • As above 	
9 Climate change	<ul style="list-style-type: none"> • Resilient employment opportunities 		<ul style="list-style-type: none"> • Physical and mental health 	<ul style="list-style-type: none"> • Employment derived cohesion • Neighbourhood derived cohesion 	<ul style="list-style-type: none"> • Social benefit of avoided CO2e
Governance-based					
10 Governance				<ul style="list-style-type: none"> • Community cohesion 	<ul style="list-style-type: none"> • Governance

4. Social Outcome Indicators for Marine Planning

4.1 Introduction

This section sets out indicators with which to monitor the social outcomes of the East Plans. The development of the indicator set has required a series of sequential steps:

- A scoping exercise of major data and indicator sets to ascertain their relevance to each social outcome category and their suitability for marine plan monitoring;
- Targeted identification and detailed appraisal of possible relevant indicators guided by the detailed social outcomes identified by the East Plans logic chain analysis.

4.2 Scoping and appraisal of indicators

A scoping exercise was undertaken of potential data sources and indicator sets in relation to the five social impact categories previously identified. The purpose of this task was to build an understanding of the range and depth of available sources from which social outcome indicators could be constructed. Potential data sources were identified through a review of MMO data registers of relevant MMO projects⁵, the ONS wellbeing measures and their data sources, the consultants own knowledge of available data sources, and targeted investigation via relevant organisations⁶. A summary of the most appropriate datasets identified, and source weblinks, is presented in Annex B.

Following the scoping exercise potential indicator types were identified from the available datasets, guided by the specific outcomes (and outputs where appropriate) identified in the East Plans objective logic chains (as summarised in Table 1). These indicators were subject to a more detailed appraisal to establish their suitability for inclusion in the monitoring framework. The following set of appraisal criteria were used to aid indicator selection.

- Description: provides a brief clarifying description of the indicator.
- Rationale: considers whether the indicator is suitable and conceptually well-founded, in order to monitor the relevant social outcome(s).
- Availability: considers whether there is sufficient data available to calibrate the indicator and thus allow change to be tracked over all the relevant spatial and temporal dimensions, and whether the data can be readily accessed.
- Technical soundness: considers if the data is validated and whether the quality meets defined standards/codes of practice and is anticipated to be subject to ongoing capture and publication.

This section sets out the suggested indicators for monitoring social outcomes from the East Plans.

⁵ <http://www.marinemangement.org.uk/marineplanning/key/index.htm>

⁶ Such as Office for National Statistics, and the Marine and Coastguard Agency.

Economy and labour market indicators

Providing employment opportunities is recognised as being an important element in promoting material wellbeing, as well as being central to individual identity and social status and an important contributor to physical and mental health. It can also contribute to the development of social capital and community cohesion. Conversely, unemployment can be detrimental to individual identity and social status, physical and mental health, as well as a key cause of deprivation, weak social capital and community cohesion (MMO 2014b).

Given the nature of social outcomes identified in Table 1, the following potential indicators have been identified for the purposes of monitoring the economy and labour market social outcomes:

- 101 Marine sector employment
- 102 Marine sector employment as a proportion of total coastal community employment
- 103a/b Specific sector employment (offshore renewable energy; coastal tourism and recreation; commercial fishing; aquaculture)
- 104 Change in occupational structure
- 105 Coastal community employment deprivation
- 106 Coastal community employment rate
- 107 Coastal community income deprivation
- 108 Coastal community median household income.

101	Marine sector employment
Description	The indicator monitors the absolute and percentage change in marine sector employment
Rationale	The principal source of social benefit from economic activity is through the generation of employment (and reduction in unemployment) and the associated benefits of income to access material goods and services, health, social status and community cohesion. The employment-based indicator represents the social output benefits derived from marine sector activity in the East Plan area. Given the strength of evidence on the wide range of social benefits associated with employment, this is considered to be an appropriate proxy indicator for the social outcomes.
Availability	Scale: Super Output Area (SOA) and above Frequency: Annual Source: ONS Business Register and Employment Survey (BRES) Access and cost: (1) UK Data Service. Requires application for a special license. Bespoke statistical analysis required to develop the indicator. (2) Nomis ⁷ . Cost (£60+VAT). Simple analysis required using online tool.
Technical robustness	BRES are Official Statistics and are therefore considered to be very robust.

⁷ Nomis is a service provided by the ONS to give access to UK labour market statistics from official sources

101	Marine sector employment
	There are a number of limitations in the accuracy with which all marine activities can be identified through Standard Industrial Classification (SIC) codes, most notably with regard to offshore renewable energy generation.
102	Marine sector employment as proportion of total coastal community employment
Description	The indicator monitors the change in the proportion of employment of a coastal community that is in marine sectors
Rationale	<p>The principal source of social benefit from economic activity is through the generation of employment (and reduction in unemployment) and the associated benefits of income to access material goods and services, health, social status and community cohesion.</p> <p>The employment-based indicator represents the social output benefits derived from marine sector activity in the East Plan area. Given the strength of evidence of the wide range of social benefits associated with employment, this is considered to be an appropriate proxy indicator for the social outcomes.</p>
Availability	<p>Scale: Super Output Area (SOA) and above</p> <p>Frequency: Annual</p> <p>Source: ONS Business Register and Employment Survey (BRES)</p> <p>Access and cost: (1) UK Data Service. Requires application for a special license. Bespoke statistical analysis required to develop the indicator. (2) Nomis. Cost (£60+VAT). Simple analysis required using online tool.</p>
Technical robustness	<p>BRES are Official Statistics and are therefore considered to be very robust.</p> <p>There are a number of limitations in the accuracy with which all marine activities can be identified through Standard Industrial Classification (SIC) codes, most notably with regard to offshore renewable energy generation. There is also a notable difference in the number of commercial fishing jobs reported by BRES and by MMO Fisheries Statistics, with BRES considered to be an underestimate.</p>
103a	Change in specific sector employment
Description	The indicator monitors absolute and percentage change of specific marine sectors of relevance of a given plan area
Rationale	Specific sectors may be the focus of certain policies in each marine plan area, directly or indirectly. The employment-based indicator represents the social output benefits derived from marine sector activity in the East Plan area. Given the strength of evidence of the wide range of social outcome benefits associated with employment, this is considered to be an appropriate proxy indicator for the social outcomes related to a given sector.

103a	Change in specific sector employment
Availability	<p>Scale: Super Output Area (SOA) and above Frequency: Annual Source: ONS Business Register and Employment Survey (BRES) Access and cost: (1) UK Data Service. Requires application for a special license. Bespoke statistical analysis required to develop the indicator. (2) Nomis. Cost (£60+VAT). Simple analysis required using online tool.</p>
Technical robustness	<p>BRES are Official Statistics and are therefore considered to be very robust. There are a number of limitations in the accuracy with which all marine activities can be identified through Standard Industrial Classification (SIC) codes, most notably with regard to offshore renewable energy generation. There is also a notable difference in the number of commercial fishing jobs reported by BRES and by MMO Fisheries Statistics, with BRES considered to be an underestimate.</p>

103b	Change in specific sector employment – commercial fishing
Description	The indicator monitors absolute and percentage change in commercial fishing employment
Rationale	<p>The commercial fishing sector may be the focus of certain policies in each plan area, directly or indirectly. The employment-based indicator represents the social output benefits derived from marine sector activity in the East Plan area. Given the strength of evidence of the wide range of social outcome benefits associated with employment, this is considered to be an appropriate proxy indicator for the social outcomes related to a given sector.</p>
Availability	<p>Scale: Administration port Frequency: Annual Source: MMO Annual Fisheries Statistics Access and cost: MMO publication. No cost.</p>
Technical robustness	<p>Data on employment are reported directly to MMO by administration port for over 10 metre vessels. Estimates are made for under 10 metre vessels based on the number of registered vessels. There is also a notable difference in the number of commercial fishing jobs reported by ONS Business Register and Employment Survey (BRES) and by MMO Fisheries Statistics, with BRES considered to be an underestimate. MMO methodology is felt to provide a more accurate estimate than the sampling approach used in the BRES. Notably MMO data is only available at administration port level, which may not be useful for local area analysis.</p>
East Plan relevance	<p>Objective 3 – offshore wind Objectives 4 and 5 – recreation and tourism Objectives 6, 7 and 8 – recreation and tourism; commercial</p>

103b	Change in specific sector employment – commercial fishing
	fishing; aquaculture

104	Marine sector jobs by occupation type
Description	Percentage distribution of marine sector jobs across the nine major occupation types.
Rationale	Changes in the occupational distribution of a coastal economy can be used to identify and analyse how the economy is developing with regard to employee skill levels and requirements. Therefore, as the data is at Local Authority level, any changes occurring due to the marine economy may not be visible.
Availability	Scale: Local authority district and above Frequency: Quarterly Source: ONS Annual Population Survey (APS) Access and cost: (1) UK Data Service. A special license is required in order to access data below Government Office Region. Bespoke statistical analysis required to develop the indicator. (2) Nomis. Cost (£60+VAT). Simple analysis required using online tool.
Technical robustness	APS are Official Statistics and are therefore considered to be very robust. It is not possible to isolate changes for the marine sector only.

105	Community employment deprivation
Description	Relative measure of employment deprivation. Number of coastal Lower Super Output Areas (LSOAs) that are amongst the 10 per cent most employment deprived in England.
Rationale	A broad measure of the relative employment deprivation level of coastal communities. This domain from the Indices of Multiple Deprivation (IMD) is conceptualised as involuntary exclusion of the working age population from work. The employment deprived are defined as those who would like to work but are unable to do so through unemployment, sickness or disability. Due to the variety of social benefits associated with unemployment. Worklessness is regarded as a deprivation in its own right, and not simply a driver for low income. It provides an indication of the relative extent to which the social benefits of employment are not being attained.
Availability	Scale: LSOA and above Frequency: Every three years Source: Indices of Multiple Deprivation (IMD), Department for Communities and Local Government (DCLG) Access and cost: Published data. Simple analysis required. No cost.
Technical robustness	The IMD is constructed using existing robust, nationally available data sets. The health deprivation indicator is a relative not an absolute measure of deprivation. Over time, the overall

105	Community employment deprivation
	rank of an LSOA may not change, but this does not mean there have been no changes to the level of deprivation. Conversely, an LSOA may increase or decrease in rank without any actual change in levels of deprivation occurring. Changes to the underlying indicators and methodology weaken the temporal consistency; however temporal comparisons can be made.

106	Employment rate
Description	Change in the employment rate (%) of 16 to 64 year olds in plan area coastal communities.
Rationale	The employment rate is the proportion of a population that are employed. Worklessness is regarded as an important deprivation, representing a range of negative social issues. Changes in the employment rate provide an indication of the extent to which worklessness is become more or less prevalent within plan area communities.
Availability	Scale: Local authority district Frequency: Quarterly Source: ONS Annual Population Survey (APS) Access and cost: (1) UK Data Service. A special license is required in order to access data below Government Office Region. Bespoke statistical analysis required to develop the indicator. (2) Nomis. No cost. Simple analysis required using online tool.
Technical robustness	APS are Official Statistics and are therefore considered to be very robust.

107	Community income deprivation
Description	Relative measure of income deprivation. Number of coastal Lower Super Output Areas (LSOAs) that are amongst the 10 per cent most income deprived in England.
Rationale	A broad measure of the relative income deprivation level of coastal communities. This definition of income deprivation adopted for this domain includes both families that are out-of-work and families that are in work but who have low earnings. Income is a proxy for material deprivation i.e. lack of socially perceived necessities, such as an adequate diet or consumer durables. Access to material benefits is a principal social benefit of employment. The indicator provides an indication of the relative extent to which the material benefits of employment are not being attained.
Availability	Scale: LSOA and above Frequency: Every three years Source: Indices of Multiple Deprivation (IMD), Department for Communities and Local Government (DCLG) Access and cost: Published data. Simple analysis required. No

107	Community income deprivation
	cost.
Technical robustness	The IMD is constructed using existing robust, nationally available data sets. The health deprivation indicator is a relative not an absolute measure of deprivation. Over time, the overall rank of an LSOA may not change, but this does not mean there have been no changes to the level of deprivation. Conversely, an LSOA may increase or decrease in rank without any actual change in levels of deprivation occurring. Changes to the underlying indicators and methodology weaken the temporal consistency; however temporal comparisons can be made.

108	Coastal community median household income
Description	Median household disposable income (£)
Rationale	Median is considered to give a better representation of the 'typical household' than the mean, because income distributions are positively skewed. Income is a proxy for material deprivation i.e. lack of socially perceived necessities, such as an adequate diet or consumer durables. Access to material benefits is a principal social benefit of employment. The indicator provides an indication of the extent to which the income level of the typical household is changing.
Availability	Scale: Local authority district Frequency: Annual Source: ONS Annual Survey of Hours and Earnings (ASHE) Access and cost: ONS. No cost.
Technical robustness	ASHE are Official Statistics and are therefore considered to be very robust.

Environmental amenity

Measuring environmental amenity requires an understanding of the level of amenity that an individual obtains from an interaction with the marine and coastal environment, and how many individuals are obtaining that amenity. An indicator, or bundle of indicators, should therefore be able to account for how environmental amenity changes in response to changes in both the quality of environment (changes in amenity per visit) and the quantity of units through which amenity is attained (changes in number of visits).

Changes in terms of quantity can be identified through an understanding of the numbers of people undertaking relevant activities in coastal and marine areas. There are a small number of surveys that provide options for obtaining appropriate data. These included Natural England's MENE, and VisitEngland's (VE) Day Visitor Survey and Overnight Tourism Survey. As VE exclude visits lasting less than three hours and therefore many locally-based recreation activities, the Natural England source is preferred.

Changes in quality can be identified primarily through subjective surveys and through economic valuation surveys. Whilst there are one-off surveys that have been carried out to ascertain such information, there are no known regular surveys available from

which changes over time could be extracted. Given that the quality of amenity attained by an individual is a function of the quality of the underlying environment that they are appreciating, a proxy environmental indicator could be identified from the anticipated MMO environment monitoring framework.

The following indicator has been identified for the purposes of monitoring the environmental amenity social outcomes:

- 201 Number of recreation visits to a beach or other coastline.

201	Number of outdoor recreation visits to a beach or other coastline
Description	The indicator monitors the quantity of outdoor leisure activity occurring at a beach or at other types of coastline
Rationale	The volume of visits to marine and coastal areas is one of the necessary components to understanding environmental amenity. The indicator provides a partial coverage of environmental amenity, capturing only the quantity of visits to the coast/marine area, and only capturing data on those actually visiting. It thereby excludes information on the quality of the visit and excludes those receiving amenity through indirect mediums (e.g. TV) or via their held non-use values.
Availability	Scale: Local Authority (LA) Frequency: Annual Source: Natural England Monitoring Engagement with the Natural Environment (MENE) Access and cost: Natural England. Simple bespoke analysis required using online tool. No cost
Technical robustness	Survey data is categorised as 'Official Statistics', produced and published according to arrangements approved by the UK Statistics Authority, and are therefore considered to be robust. The sample size at plan area level (groups of LAs) is considered to be satisfactory (well in excess of 100, which is the guide level indicated by MENE).

Health, safety and education

Health, safety and education benefits can stem from economy, society and environment-based policies. The following indicator options have been identified:

Health and safety

- 301 Health deprivation
- 302 Activity-based visits occurring at the coast
- 303 Subjective mental health benefits of visiting the beach/coast
- 304 Subjective life satisfaction
- 305 Subjective satisfaction with health
- 306 Number of accidents at sea
- 307 Number of hazardous substance release (HSR) events as a result of ship collisions.

Education

- 308 Education and skills deprivation
- 309 Learning about the natural environment
- 310 Job related training (APS).

301	Health deprivation
Description	Relative measure of health deprivation. Number of coastal Lower Super Output Areas (LSOAs) that are amongst the 10 per cent most deprived in England.
Rationale	A broad measure of the relative health deprivation level of coastal communities. This domain from the Indices of Multiple Deprivation (IMD) measures premature death and the impairment of quality of life by poor health, including physical and mental health. It provides a robust indicator of the broad social outcome of health, although the outcome indicator will be affected by multiple factors, of which marine planning and activity is just one.
Availability	Scale: LSOA Frequency: Every three years Source: Indices of Multiple Deprivation (IMD), Department for Communities and Local Government (DCLG) Access and cost: Published data. No cost. Simple analysis required
Technical robustness	The IMD is constructed using existing robust, nationally available data sets. The health deprivation indicator is a relative not an absolute measure of deprivation. Over time, the overall rank of an LSOA may not change, but this does not mean there have been no changes to the level of deprivation. Conversely, an LSOA may increase or decrease in rank without any actual change in levels of deprivation occurring. Changes to the underlying indicators and methodology weaken the temporal consistency; however temporal comparisons can be made.

302	Activity-based visits occurring at the coast
Description	Number of physically active visits occurring in the marine and coastal area
Rationale	There is extensive evidence of the physical and mental health benefits of physical exercise. The indicator demonstrates the amount of physical exercise occurring in the marine and coastal area, changes in the volume of which one can assume equates to changes in physical exercise health benefits.
Availability	Scale: Local Authority (LA) Frequency: Annual Source: Natural England Monitoring Engagement with the Natural Environment (MENE) Access and cost: Natural England. Simple bespoke analysis required using online tool. No cost
Technical	Survey data is categorised as 'Official Statistics', produced and

302	Activity-based visits occurring at the coast
robustness	published according to arrangements approved by the UK Statistics Authority, and are therefore considered to be robust. The sample size at plan area level (groups of LAs) is considered to be satisfactory (well in excess of 100, which is the guide level indicated by MENE).

303	Subjective mental health benefits of visiting the coast
Description	Average rank (1 to 5) of mental health benefits of coastal visit
Rationale	There is extensive evidence of the physical and mental health benefits of physical exercise. The indicator provides a score (1 strongly disagree to 5 strongly agree) on whether the visit made the person (i) feel calm and relaxed, and (ii) feel refreshed and revitalised. As such it indicates the mental health benefits of physical activity.
Availability	Scale: Local Authority (LA) Frequency: Annual Source: Natural England Monitoring Engagement with the Natural Environment (MENE) Access and cost: Natural England. Simple bespoke analysis required using online tool. No cost
Technical robustness	Survey data is categorised as 'Official Statistics', produced and published according to arrangements approved by the UK Statistics Authority, and are therefore considered to be robust. The sample size at plan area level (groups of LAs) is considered to be satisfactory (well in excess of 100, which is the guide level indicated by MENE).

304	Subjective life satisfaction
Description	Average ranking of 'life satisfaction' for the population of a given area.
Rationale	Provides an overall subjective score of people's wellbeing. Can be established to represent particular coastal community populations. As the indicator is a broad measure of wellbeing, the conceptual link to the effects of a plan are likely to be weak, particularly given the geographic scale at which the data is available.
Availability	Scale: Unitary authority/county areas Frequency: Expected to be annual Source: ONS Subjective Wellbeing Annual Population Survey Access and cost: Published statistics. No cost
Technical robustness	Survey data is categorised as 'Experimental Statistics', produced and published according to arrangements approved by the UK Statistics Authority. This is the first year the statistics have been produced and the methodology is subject to change.

305	Subjective satisfaction with health
Description	Subjective ranking of satisfaction with health (1 completely

305	Subjective satisfaction with health
	dissatisfied to 7 completely satisfied)
Rationale	Provides an overall subjective score of people's satisfaction with their health. Can be established to represent particular coastal community populations
Availability	Scale: Lower Super Output Areas (LSOA) Frequency: Annual Source: Understanding Society, Institute for Social and Economic Research (ISER), at the University of Essex Access and cost: UK Data service; data below county level requires application for a special license. Stata software is required to analyse the raw data in order to produce bespoke area analysis
Technical robustness	Robust survey with sample of approx 40,000. Sample may become small for bespoke spatial areas. Exact questions asked are not fixed and may change over time, limiting temporal comparisons.

306	Number of accidents at sea
Description	Number of accidents occurring at sea
Rationale	Contributes to the understanding of frequency and location of accidents at sea.
Availability	Scale: Point data Frequency: Annual Source: Marine Accident Investigation Branch (MAIB) investigation reports Access and cost: MAIB website. No cost. Simple analysis required
Technical robustness	All accidents are reportable by law to the MAIB. Not all accidents require full investigation however all are recorded in database of accidents with basic information captured.

307	Number of hazardour substance release (HSR) events as a result of ship collisions
Description	Number of sea-based instances of ship collisions that result in the release into the marine environment of hazardous substances
Rationale	Contributes to the understanding of HSR incidents and spatial location. May not provide broader indication of impacts (health, amenity, employment) as not all events will result in such impacts.
Availability	Scale: Point data Frequency: Annual Source: Marine Accident Investigation Branch (MAIB) investigation reports Access and cost: MAIB website. No cost. Simple analysis required
Technical robustness	All accidents are reportable by law to the MAIB. Not all accidents require full investigation however all are recorded in database of

307	Number of hazardour substance release (HSR) events as a result of ship collisions
	accidents with basic information captured. Information on HSR captured at location of occurrence. Not primary responsibility of the MAIB to monitor/identify HSR events

308	Education and skills deprivation
Description	Relative level of education and skills deprivation. Number of coastal Lower Super Output Areas (LSOAs) that are amongst the 10 per cent most deprived in England for education and skills.
Rationale	A broad measure of the relative education and skills deprivation level of coastal communities. This domain from the Indices of Multiple Deprivation (IMD) measures premature death and the impairment of quality of life by poor health, including physical and mental health. It provides a robust indicator of the broad social outcome of health, although the outcome indicator will be affected by multiple factors, including marine planning and activity.
Availability	Scale: LSOA Frequency: Every three years Source: Indices of Multiple Deprivation (IMD), Department for Communities and Local Government (DCLG) Access and cost: Published data. No cost. Simple analysis required
Technical robustness	The IMD is constructed using existing robust, nationally available data sets. The education and skills deprivation indicator is a relative not an absolute measure of deprivation. Over time, the overall rank of an LSOA may not change, but this does not mean there have been no changes to the level of deprivation. Conversely, an LSOA may increase or decrease in rank without any actual change in levels of deprivation occurring. Changes to the underlying indicators and methodology weaken the temporal consistency; however temporal comparisons can be made.

309	Subjective environmental learning benefits of visiting the coast
Description	Average rank (1 to 5) of whether learning about the natural world took place during the visit
Rationale	The indicator provides a score (1 strongly disagree to 5 strongly agree) on whether the individual undertaking the visit 'learned something new about the natural world'.
Availability	Scale: Local Authority Frequency: Annual Source: Natural England MENE Access and cost: Natural England. Simple bespoke analysis required using online tool. No cost
Technical	Survey data is categorised as 'Official Statistics', produced and

309	Subjective environmental learning benefits of visiting the coast
robustness	published according to arrangements approved by the UK Statistics Authority, and are therefore considered to be robust. The sample size at plan area level (groups of LAs) is considered to be satisfactory (well in excess of 100, which is the guide level indicated by MENE).

310	Job related training
Description	Number of people receiving job related training in the last 13 weeks
Rationale	The data provide an indication of the amount of continued training and development occurring in the workplace. It cannot be linked to just marine sector opportunities, and therefore the link between the indicator and the marine plan will be very weak.
Availability	Scale: Local Authority Frequency: Quarterly Source: ONS Annual Population Survey Access and cost: UK Data Service. Bespoke analysis required
Technical robustness	Survey data is categorised as 'Official Statistics', produced and published according to arrangements approved by the UK Statistics Authority, and are therefore considered to be robust.

Community cohesion

Community cohesion cuts across multiple issues, and there are multiple definitions available. Local Government Association (LGA) (2002) identified four key points that defined cohesive communities: (i) a common vision/sense of belonging; (ii) people's diversity is valued; (iii) similar life opportunities for all; (iv) positive relationships between people. The following indicator options have been identified:

- Close-knit neighbourhoods
- Neighbourhood belonging
- Multiple deprivation.

401	Close-knit neighbourhoods
Description	Rank (1 strongly agree to 5 strongly disagree) of subjective view of how close-knit a residents neighbourhood is.
Rationale	A community is likely to be more cohesive where people from different backgrounds get on with each other (Home Office, 2003). A close-knit community may be considered to be one in which people get on with and support each other.
Availability	Scale: Lower Super Output Area (LSOA) and above Frequency: Every 3 years Source: Understanding Society, Institute for Social and Economic Research (ISER), at the University of Essex Access and cost: UK Data service; data below county level requires application for a special license. Stata software is required to analyse the raw data in order to produce bespoke area analysis.

401	Close-knit neighbourhoods
Technical robustness	Robust survey with sample of approx 40,000. Sample may become small for bespoke spatial areas. Exact questions asked are not fixed and may change over time, limiting temporal comparisons.

402	Neighbourhood belonging
Description	Subjective view of whether individuals feel like they belong to their neighbourhood. Rank (1 strongly agree to 5 strongly disagree).
Rationale	A community is likely to be more cohesive at the local level where people feel a sense of belonging to their neighbourhood/local area (Home Office, 2003)
Availability	Scale: Lower Super Output Area (LSOA) and above Frequency: Every 3 years Source: Understanding Society, Institute for Social and Economic Research (ISER), at the University of Essex Access and cost: UK Data service; data below county level requires application for a special license. Stata software is required to analyse the raw data in order to produce bespoke area analysis
Technical robustness	Robust survey with sample of approx 40,000. Sample may become small for bespoke spatial areas. Exact questions asked are not fixed and may change over time, limiting temporal comparisons.

403	Multiple deprivation
Description	Relative level of multiple deprivation. Number of coastal Lower Super Output Areas (LSOAs) that are amongst the 10 per cent most deprived in England for multiple deprivations.
Rationale	Pockets of severe deprivation may lead to social tensions and conflict. A community is more likely to be cohesive where there are low levels of deprivation and fewer socio-economic differences between people (Home Office, 2003). The indicator provides a measure of the relative multiple deprivation level of coastal communities.
Availability	Scale: LSOA Frequency: Every three years Source: Indices of Multiple Deprivation (IMD), Department for Communities and Local Government (DCLG) Access and cost: Published data; no cost
Technical robustness	The IMD is constructed using existing robust, nationally available data sets. The multiple deprivation indicator is a relative not an absolute measure of deprivation. Over time, the overall rank of an LSOA may not change, but this does not mean there have been no changes to the level of deprivation. Conversely, an LSOA may increase or decrease in rank without

403	Multiple deprivation
	any actual change in levels of deprivation occurring. Changes to the underlying indicators and methodology weaken the temporal consistency; however temporal comparisons can be made.

Governance

There are no readily available, appropriate impact indicators available that can adequately capture the governance impacts of marine planning. (There are notably relevant process indicators being developed by MMO)⁸.

4.3 Social outcome monitoring indicators

The indicators

Of the data and indicator sources considered in Annex B, and the short-list of indicators appraised above, it is suggested that a proportionate number are taken forward for consideration alongside non-social indicators in MMO's monitoring framework. The following list identifies readily available indicators that represent some of the main potential social impacts associated with marine plans, although it is recognised that they cannot provide a full coverage of all potential impacts.

- 101 Marine sector employment
- 102 Marine sector employment as a proportion of total coastal community employment
- 105 Coastal community employment deprivation
- 106 Coastal community employment rate
- 107 Coastal community income deprivation
- 201 and 302 Number of recreation visits to the coast
- 301 Health deprivation
- 303 (Subjective) mental health benefits of visiting the coast
- 309 (Subjective) learning about the natural environment during visits to the coast
- 403 Coastal community multiple deprivation.

Each of the indicators identified can be constructed for local coastal community areas covering the whole of the coastal community of a plan area, or for a number of spatially explicit coastal communities in a plan area, depending on the broader structure of the plan and its individual monitoring framework.

Each of the indicators can be constructed at a national level, covering the whole of England or UK and for the combined coastal communities of all plan areas. As such, the performance of individual plan areas can be contrasted and summed to develop a national picture of performance. This will aid demonstration of the outcomes at a national level, for consideration against the overall achievement of the MPS objectives.

⁸https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/324567/eastimpfinal.pdf (pages 71-79).

The indicators are most appropriately presented at the plan-level, as this is the level that the objectives (and policies) are set. Tracking of the time-series data can then be most appropriately undertaken through tables and graphs (as illustrated below).

There are a number of weaknesses in the indicator set, which occur due to the general lack of regularly produced, geographically comprehensive quantitative and qualitative data on social issues. These include:

- Poor definition of the marine sector through Standard Industrial Classification (SIC) codes for generating employment indicators
- Partial coverage of environmental amenity impacts, notably the lack of information that relates to the amenity value derived from an individual visit to the coast
- Lack of directly relevant community cohesion measures
- Lack of comprehensive data on marine ecosystem services
- As outcome indicators, they are subject to a variety of marine plan and non-marine plan derived forces.

When monitoring each of these indicators they should be presented alongside those for the environment and economic pillars. The environment- and economy-derived social impacts are a particularly prominent feature of the East Plans (seven out of the 11 objectives). Pairing the social indicators with relevant economic and environment indicators can help to provide a more insightful picture, and overcome some of the weaknesses of the social indicators.

General definitions and indicator construction methods

This section provides detail on the data sources and basic analytical methods required to construct each of the indicators identified in Section 4. For all of the indicators chosen, the data is readily available and the analysis required for their construction straightforward.

General definitions

Marine sector employment

Marine sectors are defined using Standard Industrial Classification (SIC) codes, based on those classified in Pugh (2009) as being 'substantially marine': SICs: 03.11 - 03.21 - 06.10 - 06.20 - 09.10 - 10.20 - 30.11 - 30.12 - 33.15 - 50.10 - 50.20 - 52.22 - 52.24/1 - 77.34/1 (see Annex C for definitions).

This definition should be refined based on the outputs of research project MMO 2014c.

Coastal communities

The relevant definition of a plan coastal community should be established during the initial marine planning analysis stage for any given plan. If local analysis is not possible, then a simple Local Authority level definition could be utilised based on MMO (2011).

Coastal communities

A more tightly defined coastal community could be defined using groups of LAU-2⁹ units, based on EU (2012)¹⁰, which uses the following definition: “if a municipality borders the sea, it is by default coastal; if a municipality is not bordering the sea but has 50% of its surface within a distance of 10km from the sea it is considered to be coastal”. (Other small area units such as Lower Super Output Area could also be used).

If appropriate, the coastal community of a marine plan area could be broken down into more than one group. Again, this should be defined during the early marine planning analysis stage. This may be most appropriate where there are fundamental differences in the economic and social geography of a marine plan coastal community, or where policies are spatially targeted. Note that increasing the number of areas will rapidly increase the volume of data that needs to be presented.

For the East Plans, MMO (2011) define the relevant spatial area as districts and unitary authorities (UAs) with coastline in the plan area, and any relevant neighbouring districts/UAs. The following are identified:

East Riding of Yorkshire	Fenland	Scarborough
Kingston upon Hull	North Norfolk	Tendring
North Lincolnshire	Great Yarmouth	Ipswich
North East Lincolnshire	Broadland	Babergh
East Lindsey	South Norfolk	
Boston	Norwich	
South Holland	Waveney	
King's Lynn and West Norfolk	Suffolk Coastal	

Marine sector employment-based indicators

Indicator	Marine sector employment-based indicators
Data access	ONS Business Register and Employment Survey (BRES) via Nomis or UK Data Service
Definitions	Units: employment Marine sectors: defined using Standard Industrial Classification (SIC) codes Plan area coastal communities: defined using districts/UAs
Statistics presented	Total marine sector employment (index) Annual % change in marine sector employment Marine sector employment as % of total employment
Method	(1) Extract annual employment data for relevant sectors and areas. (2) Calculate simple statistics

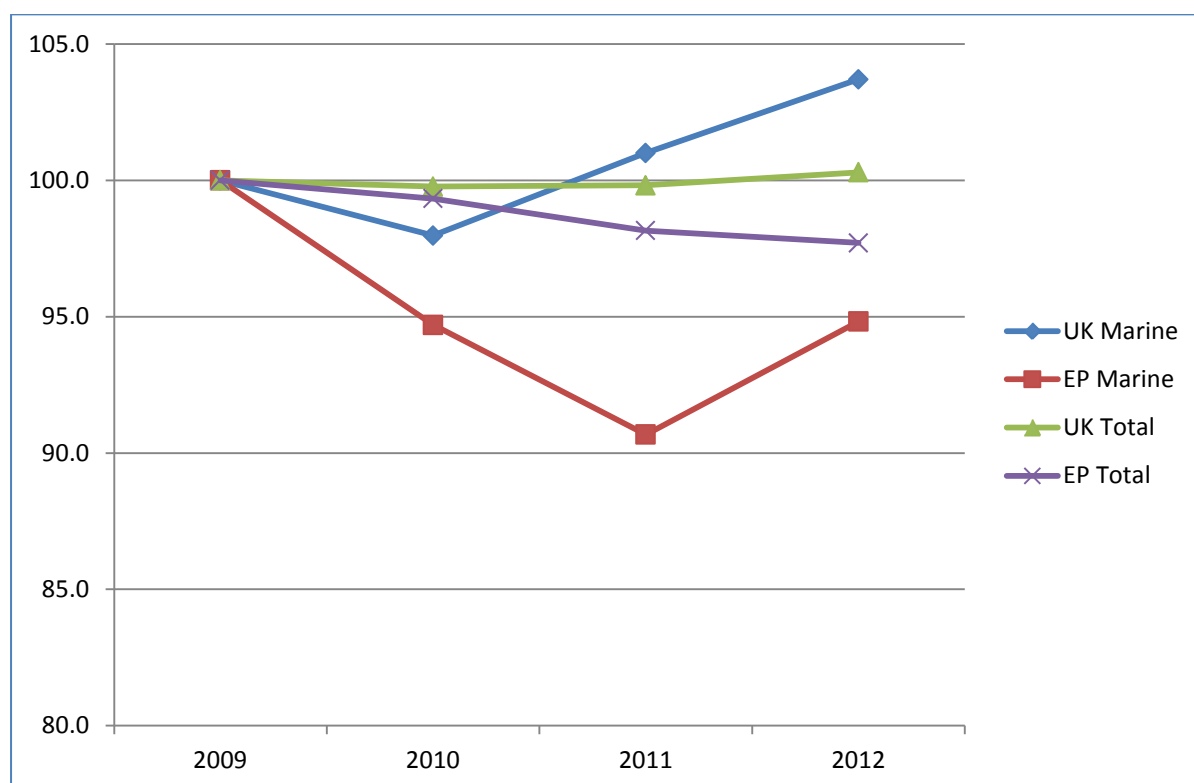
	2009	2010	2011	2012
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⁹ LAU-2 (Local Administrative Units): are electoral wards. For further information see: <http://www.ons.gov.uk/ons/guide-method/geography/beginner-s-guide/eurostat/relationship-of-nuts-to-uk-administrative-geographies.html>

¹⁰ Coastal wards dataset is identified in the data catalogue for MMO (2013) (MMO1038) and is available on request from ONS Tourism Intelligence Unit

	2009	2010	2011	2012
101a Marine sector employment (2009=100)				
UK	100.0	98.0	101.0	103.7
East Plans	100.0	94.7	90.7	94.8
101b Marine sector employment growth (% per annum)				
UK	-	-2.0	0.9	4.9
East Plans	-	-5.3	-4.2	4.6
102 Marine sector employment as % of total employment				
UK	0.5	0.5	0.5	0.5
East Plans	1.4	1.3	1.3	1.3

Figure 9: Employment index (2009=100).



Employment rate indicator

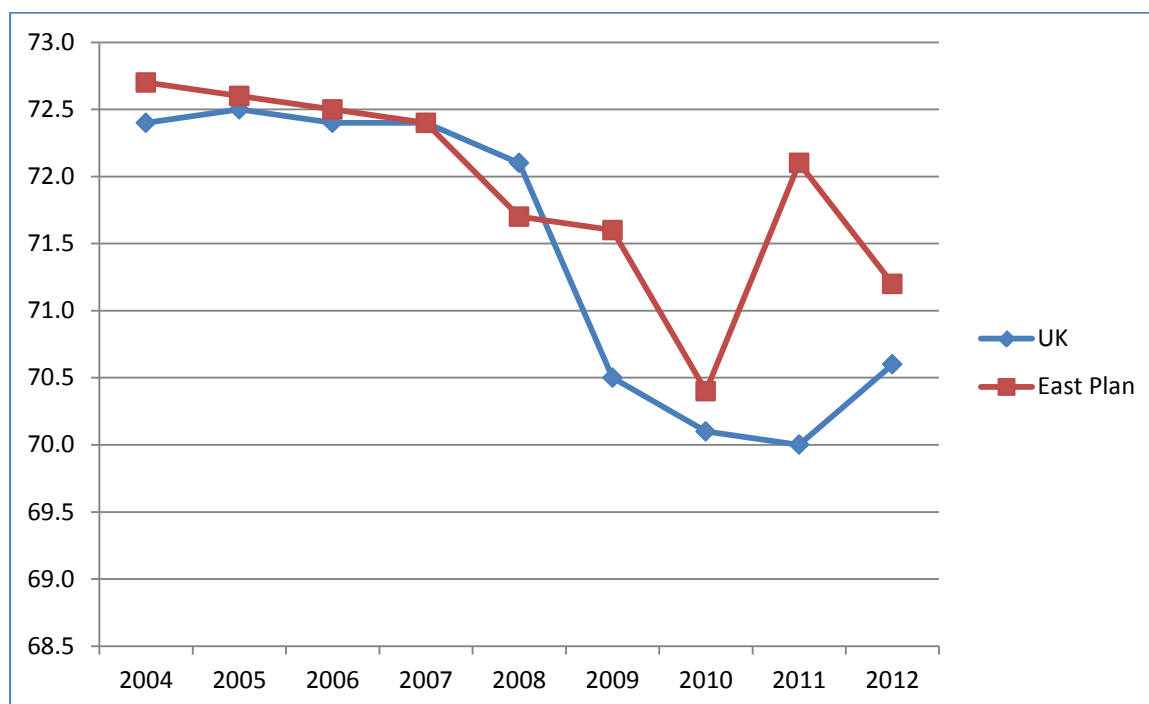
Indicator	Employment rate
Data access	APS via Nomis or UK Data Service
Definitions	Units: employed people Plan area coastal communities: defined using districts/UAs
Statistics presented	% of 16-64 year olds (the working age population) in employment
Method	Extract employment rate for relevant geographies

	2004	2005	2006	2007	2008	2009	2010	2011	2012
106 Employment rate									
UK	72.4	72.5	72.4	72.4	72.1	70.5	70.1	70.0	70.6

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	2004	2005	2006	2007	2008	2009	2010	2011	2012
East Plans	72.7	72.6	72.5	72.4	71.7	71.6	70.4	72.1	71.2

Figure 10: Employment rate.

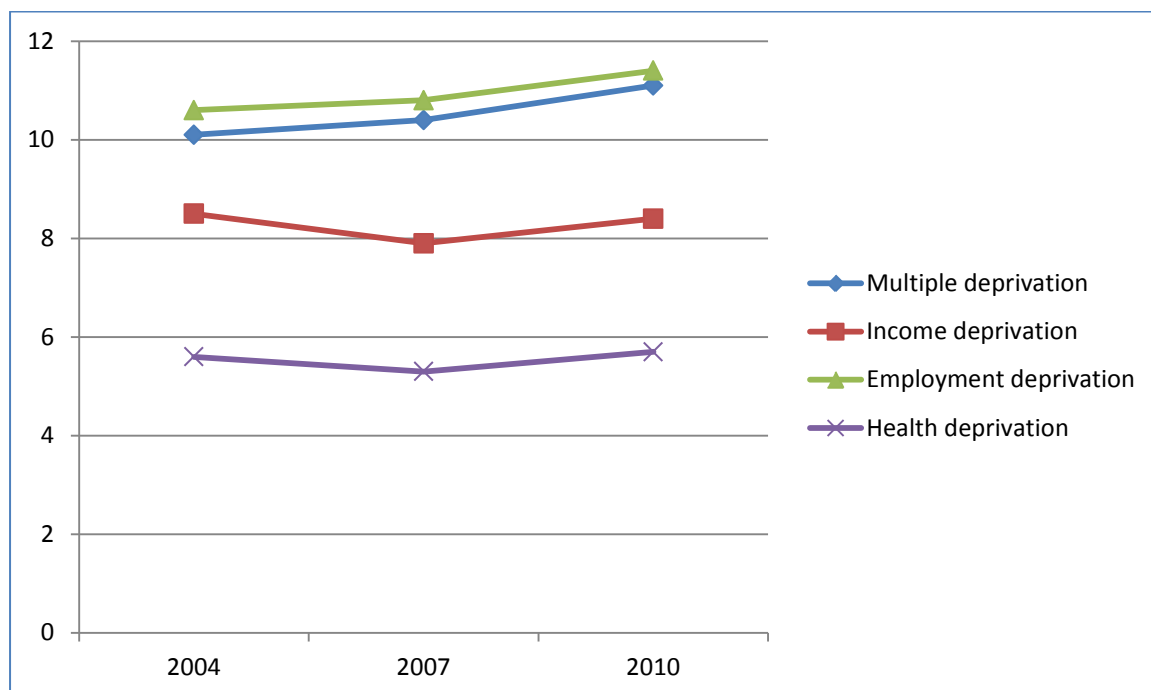


Deprivation-based indicators

Indicator	Deprivation-based indicators
Data access	Indices of Multiple Deprivation via DCLG
Definitions	Units: national deprivation rank Plan area coastal communities: defined using districts/UAs
Statistics presented	% of LSOAs in area in the 10% most employment deprived % of LSOAs in area in the 10% most income deprived % of LSOAs in area in the 10% most health deprived % of LSOAs in area in the 10% most multiple deprived
Method	Filter dataset for relevant geographies; calculate proportion of area LSOAs that are ranked below 3249 th i.e. are ranked within the 10% most deprived in England.

Deprivation type	2004	2007	2010
403 Multiple deprivation	10.1	10.4	11.1
107 Income deprivation	8.5	7.9	8.4
105 Employment deprivation	10.6	10.8	11.4
301 Health deprivation	5.6	5.3	5.7

Figure 11: Proportion of East Plan LSOAs in the 10% most deprived in England.



Coastal visit-based indicators

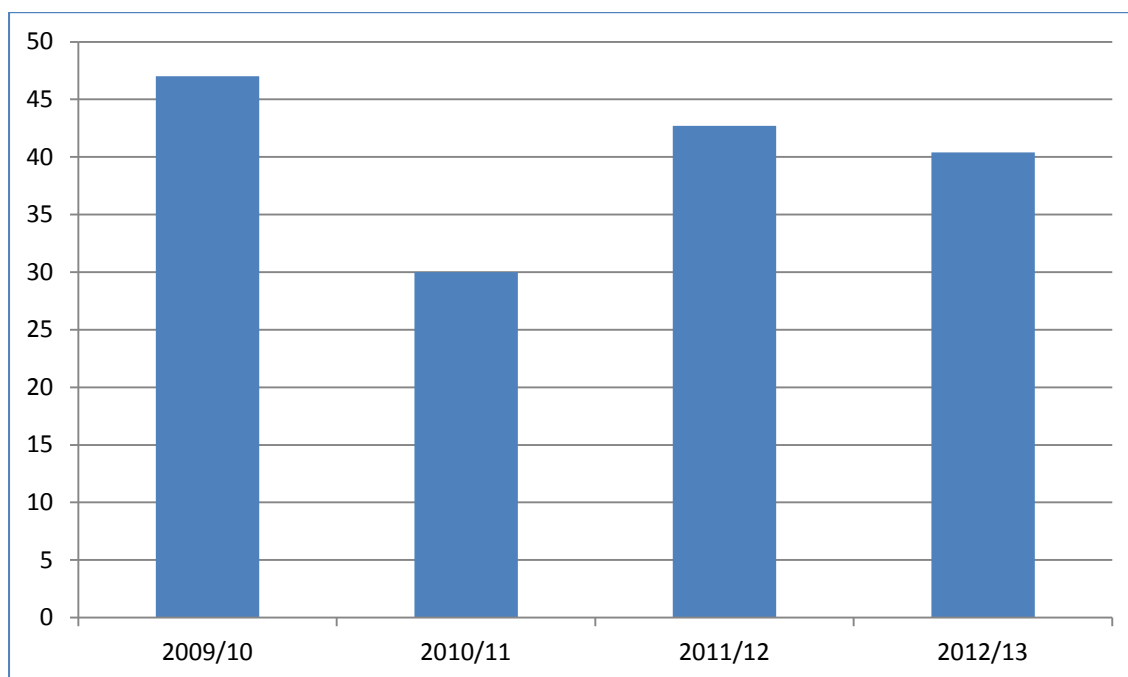
Indicator	Visit-based indicators
Data access	MENE via Natural England (raw data download)
Definitions	<ul style="list-style-type: none"> Units: grossed up (without deductions) number of visitors Plan area coastal communities: defined using districts/UAs Number of visits: using survey Question 2 (visit location), sum number of visits to (i) coastal resorts and towns, and (ii) other seaside coastline % of visits with reported mental health benefits: Using Question 2 and E2 (visit made me feel relaxed and calm), the % of coastal visits (as defined above) recorded as 'strongly agree' or 'agree' with the question % of visits with reported learning benefits: Using Question 2 and E5 (learned something new about the natural world on visit), the % of coastal visits (as defined above) recorded as 'strongly agree' or 'agree' with the question
Statistics presented	<ul style="list-style-type: none"> Total number of visits per annum % agree/disagree that the visit provided the stated benefit
Method	Simple instructions provided with Natural England MENE raw data download

	2009/10	2010/11	2011/12	2012/13
201 and 302 Number of visits to coast (million)	47.0	30.9	42.7	40.4
303 % visits with reported mental health benefits	96	88	76	68

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	2009/10	2010/11	2011/12	2012/13
309 % visits with reported learning benefits	33	20	36	42

Figure 12: Number of visits to the coast (million).



5. Attributing Change - Social Outcome Indicators as Part of an Evaluation Plan

5.1 Introduction

Section four identified social outcome indicators that might realistically be expected to be affected by plan based activity. If the effectiveness of the marine plan is to be assessed then it is necessary to identify how much change in these indicators can be *attributed* to the workings of the plan rather than the result of other influences. In the present context it is necessary to specify the relevant options in an Evaluation Plan. It would be highly desirable if the Evaluation Plan was concerned with the monitoring and effectiveness of the social, economic and environmental objectives of plan activity taken as a whole. Such an approach would allow a better investigation of the relevant interactions.

5.2 Attributing impact to the marine plan; an evaluation plan

There is a very significant literature that discusses the conceptual and measurement problems that arise in seeking to distinguish the effects of a policy from other non policy influences (e.g. Khandker *et al.*, 2010). In this study the policy is the plan and the evaluation requirement is to establish what would otherwise have happened in its absence-often referred to as the 'alternative position', or counter-factual. Clearly, the effects of the plan will unfold over a very large period of time and through a number of different pathways as described in Section 3. The standard approach is to identify the values of the indicators that the theory of change considers will be affected by the plans' policy instruments (as described in Section 3) and then track changes in them alongside changes in the strength with which the plan policy instruments are being applied. An appropriate evaluation methodology is then required to establish the counter factual.

A number of different approaches can be used to do this. The possible options include the use of control groups that compare movements in the relevant social indicators in areas not affected by the plan with those that are. Change in the plan area is compared with change in the non-plan area through time and alongside changes in the strength with which the plan is being applied. In the simplest case the relative position is compared in a period when the plan is off and then again when the plan is active. Changes in a range of contextual factors can be allowed for. In some cases where there is enough data to construct robust indicators it is possible to undertake formal econometric modelling that enable non-policy effects to be 'controlled-out'.

In the present context we have suggested in Section 4 that each of the indicators should be calibrated for the plan area but also for the national level, covering the whole of England or UK and for the combined coastal communities of all plan areas. As such, the performance of individual plan areas can then be compared and contrasted with the nation and relevant 'control' group benchmark areas through time. It would also be helpful to track movements in the monitoring indicators in areas surrounding the Marine Plan areas in order to consider possible displacement effects and also the effect of common non-plan factors.

It was mentioned in the previous section that there were difficult problems associated with assessing impacts on community cohesion. The standard approach that has been adopted in other research is to use social surveys to establish the views and perceptions of those who it is believed benefit from plan (policy) intervention. In some cases the social surveys are conducted in plan assisted areas compared to non-plan assisted and at different points in time that reflect the intensity with which the plan has operated. These surveys could also be used to establish the views of residents on changes in governance that also feature in plan objectives. The downside of this approach is that it is relatively expensive compared to approaches based on the use of secondary and administrative data sources.

Another commonly used approach is to undertake structured surveys of key stakeholders using carefully designed questionnaires that identify the additional contribution that policies have been able to make. Such survey based approaches have the disadvantage that they may be subject to optimism bias. However, they can be used in a flexible manner that enables the relative contribution of a wide range of factors, both policy and non-policy, to be assessed. They could be of value in assessing the views of stakeholders on how well plan activity has itself increased the ability of the plan to deliver its own strategic objectives as in objectives ten and eleven of the East Plans. Again, the downside is the relative cost.

All the approaches mentioned have strengths and weaknesses that need to be carefully considered in selecting the most appropriate way forward. With the passage of time it should be possible to build up a robust evidence base that would synthesise key findings (often termed a meta-analysis of project and programme evaluations).

For those social indicators, and thus objectives, that seek to build the value added derived from the whole planning process, as in Objectives 10 and 11 in the East Plans, it is also possible to use Multi-Criteria Analysis. This is a technique that can bring together a range of performance-related information. The paradigm is sufficiently flexible to accommodate qualitative information alongside quantitative data (Department for Communities and Local Government, 2009).

5.3 A way forward

It is recommended that the indicators presented in Section 4 should be measured over the full period of the marine planning cycle and that a baseline position established for all the relevant Marine Plan areas, the nation and any comparator areas. The objective would be to up-date the monitoring information on a regular cycle (every one or two years). Initial Interim Evaluation research would be appropriate at each of the three yearly plan review points, and a more comprehensive ex-post evaluation at the six yearly plan review points (or similar periods as adopted for the overall plan monitoring framework).

For those social impact areas relating to governance and strategic value added it is necessary to establish the likely amount of resources that might be available to establish the social monitoring indicators and undertake the required evaluation research. With this in place it will be possible to assess whether there is any

possibility of undertaking social survey and stakeholder qualitative interview based approaches or, for that matter, the use of Multi-Criteria Analysis.

5.4 Future research

Suggestions for future research to improve the indicator set:

- Marine National Natural Capital Accounts: pilot accounts are currently being developed by Defra. If successful these have the potential to provide a robust system for monitoring social outcomes that are linked to environmental change and ecosystem services. However it should be noted that robust ecosystem service indicators, particularly those which could be established at the level of a marine plan, may be some time in development.
- UK Standard Industrial Classification of Economic Activities (SIC) codes to better fit marine industries: the current set up of SICs does not allow a good definition of a number of marine sectors to be constructed. The most pressing of these, particularly for the East Plan areas, is offshore renewable energy. An approach to improve the degree to which particular marine sectors, and the marine sector overall, can be defined through SICs should be advanced with the ONS (expected via research project MMO1075).
- Plan area coastal communities: early analytical work for each marine plan should establish the most appropriate spatial delineation of the plan coastal community for which it will be appropriate to monitor social outcomes. Where there are particular differences in the economic and/or social geography, or where spatially explicit/targeted objectives and policies are anticipated, it may be appropriate to identify more than one community group. This work can also be used to start to develop a comprehensive baseline position and understanding.
- Environmental quality: there is a lack of data available for monitoring how people's environmental amenity changes over time in response to changes in the underlying environmental (natural or otherwise) characteristics (i.e. quality) of an area. Research should review the extent to which it may be feasible to design a question or set of questions that could provide an indication of this.
- Watersports participation survey: changes are required to the survey questions to make the data outputs more useful for marine planning purposes. Most notably, the data on participation is currently presented by area of residence of the participant and says nothing about where geographically the participants undertake the activities. It is therefore of little use for a marine plan focused on a particular area.
- Seascape character area assessments: such an assessment was undertaken for the East Plans and the South Plans. The methodology employment currently provide qualitative descriptions only. Minor amendments to the methodology should be considered that enable quantitative indicators for certain attributes to be established during the assessments, which could then be updated for the purposes of marine plan monitoring.
- Marine social surveys: there is a lack of social survey data which can be utilised for analysis of coastal communities and marine and coastal activities. Further primary research could usefully be carried out across a broad number of social issues in order to better inform and monitor marine plans.

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Annex A: Analysis for East Plans Logic Chains

This Annex provides descriptive logic chains for each of the objectives of the East Plans, which were derived through an analysis of relevant MMO documents and other relevant literature.

A.1 Objective 1 logic chain analysis

Objective 1: to promote the sustainable development of economically productive activities, while taking account of spatial requirements of other activities of importance to the East marine plan areas

The objective is focussed on improving the contribution of the East Plans area to national economic growth, principally through economic productivity benefits, by ensuring that economic opportunities are realised, as well as to local coastal economies.

There is one main policy under Objective 1 that indicates how the East Plans will deliver on this objective:

EC1: Proposals that provide economic productivity benefits which are additional to Gross Value Added currently generated by existing activities should be supported.

Context

All marine plan areas and areas adjacent to them have differing employment structures, with significant variation within and between local authority areas. Benefits derived from employment and understanding whether the employment is sustainable (benefits for both national and local economies over the long term) need to be considered when looking at activities. The objective and plan relates directly to high-level marine objectives which are seeking a sustainable marine economy by ensuring “sustainable activity, prosperity and opportunities for all, now and in the future”.

GVA is identified in the East Plans as an appropriate comparator that allows the identification of the economic contribution of different sectors. However it is noted that it should not be the sole indicator of the benefit of economy activity. Beyond GVA, it is important that the potential social and environmental benefits of economic activity are considered by decision-makers. Further, it is cautioned that in some instances sectors may have relatively low direct GVA impacts, but their indirect GVA impact may be significantly larger. This is particularly the case where sectors act as enablers for other economic sectors e.g. subsea telecommunications.

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The East Plans emphasise that whilst the policy is intended to promote the ‘most economically beneficial’ developments and activities, it also aims to gain economic benefits from ‘all’ developments and activities. Importantly the East Plans state that it is the net economic benefit that should be considered. That is the additional economic benefit after accounting for any negative impacts (be they economic, environmental or social) on other activities.

By clarifying that it is this net additional benefit that should be considered, the East Plans emphasise the aspirations for sustainable growth. Further, it provides a clear decision making framework that allows a common metric of national impact to be considered by relevant decision-makers.

Rationale

Without the East Plans there is a risk that the growth of the marine economy will not be sustainable. Economic developments and activities may occur that individually generate significant economic value, but without regard for the economic value generated by existing or future activities that it may hinder. Institutional failure may result in inadequate consideration of the net economic impact of development, resulting in lower net economic growth with the plan. Further, market failures may result in social and environmental externalities that further undermine the marine economies contribution to sustainable development.

Theory of change

The East Plans place emphasis on the need for the net additional economic impact to be considered in decision-making, thereby allowing all other relevant developments and activities to be taken into account through a single GVA metric. The focus on the net impact is further emphasised by the requirement to consider external social and environmental impacts when weighing up potentially competing proposals.

As such, the East Plans seek to increase the stock of economic capital, and the efficiency with which economic activities utilise mixed capital inputs, in order to maximise economic and associated social and environmental beneficial impacts, whilst maintaining other capital stocks for use by other activities.

By focusing on the net economic impact, with a focus on national economic growth as well as more local economies, the East Plans will help to foster sustainable development.

Logic chain

Inputs

This policy will be implemented by the regulatory authorities responsible for authorising relevant developments and activities. The East Plans’ instruments will be used to effect change that contributes to this objective.

Activities

All relevant economic activities that can be influenced by the East Plans e.g. commercial fishing, energy production, ports and shipping.

Outputs

The outputs are the marine sector jobs that stem from increased economic activity.

Outcomes

The East Plans will foster a sustainable increase in net economic activity, which will have direct social effects on the economy and labour market, as well as secondary effects on health, safety and education and community cohesion.

Economy and labour market

- Increase in marine sector employment
- Increase in average income – increases in economy productivity will feed through to increased wages.

Health, safety and education outcomes

- Physical and mental health improvement - a reduction in worklessness can produce a wide range of physical and mental health benefits for individuals (Waddell and Burton, 2006).
- Education opportunities – employment can provide opportunities for continued education and skills development.

Community cohesion outcomes

- Employment-derived community cohesion improvement – an increase in employment (and decrease in unemployment) can help to improve individual identity and social status, and build social networks and perceptions of fairness (World Bank, 2013; MMO, in press b).

A.2 Objective 2 logic chain analysis

Objective 2: To support activities that create employment at all skill levels, taking account of the spatial and other requirements of activities in the East marine plan areas.

This objective relates to the need to ensure that jobs are created for people in and adjacent to the East Plan areas. It is about helping people into work by supporting development and other activities that create jobs at all skills levels connected to activities in the marine area.

The East Plans recognise that activities for marine inshore areas can attract new industries and support existing industries. This subsequently creates economic and social benefits for those in, next to and visiting the plan areas. The East Plans build upon the UK Government's economic strategy which seeks to rebalance and diversify the local economy and address unemployment and worklessness through increased economic growth (EC1). The objective also gives priority to activities which give significant economic and employment benefits, particularly if they are sustainable in nature.

There is one policy under Objective 2 which supports the way in which the East Plans will influence the issues referred to above, namely:

EC2: Proposals that provide additional sustainable employment benefits should be supported, particularly where these benefits have the potential to meet employment needs in localities close to the marine plan areas.

Context

All marine plan areas and areas adjacent to them have differing employment structures, with significant variation within and between local authority areas. Benefits derived from employment and understanding whether the employment is sustainable (benefits for both national and local economies over the long term) need to be considered when looking at activities. The objective and plan relates directly to high-level marine objectives which are seeking a sustainable marine economy by ensuring “sustainable activity, prosperity and opportunities for all, now and in the future”.

Marine activities input across a range of different sectors and geographic areas. Specific economic activities and sub-sectors can also contribute to the supply chain for larger sectors. For example, ports are part of the supply chain for many sectors including automotive, retail and manufacturing. Maintaining and growing the local and national economies through marine activities provides jobs and income for local people and leads to the production of goods and services that add value locally, nationally and internationally.

The MPS highlights employment benefits from both existing marine activities such as fishing, marine transport, port related storage and processing, oil and gas production and new and developing industries such as the renewable energy sector and associated offshore electricity transmission. Activities across the marine area can impact upon both productivity and employment and it is noted that some activities will have such a radical impact that they have the potential to transform the economic structure of an area. To ensure that they make a greater impact, activities need to consider the economic and labour market needs of the area to understand the suitability of activities to the local environment. For areas where there are negative or low socio-economic indicators such as high unemployment, low job creation, the potential for change from marine activities will be particularly important. In other areas this may not be the most important objective for marine planning to achieve. The employment needs of areas adjacent to the marine plan areas will differ greatly, and as the plan states “the policy and objective above are intended to recognise this”.

Previous research for MMO (2011) has shown that across marine inshore areas there is variation in a range of socio-economic indicators including:

- The jobseekers’ allowance (JSA) claimant rate. There are areas with much higher than the national average as well as areas with much lower.
- Qualification levels which often lag behind the national average
- The proportion of working age people employed (the employment rate) in the local area.

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- How many people are employed in industries better known as the knowledge economy (high value added, innovative and contribute to GVA).
- The average wage or salary of an area in comparison to its wider sub-region or national average.
- How deprived areas are on the Index of Multiple Deprivation (IMD).

The objective seeks to add to a number of economic growth policy documents such as the Department for Business, Innovation and Skills' (BIS) and HM Treasury's (2011) 'Plan for Growth', as well as local authority and Local Enterprise Partnership strategic plans. At a national level, there is a desire for increased employment and rebalancing of the economy towards the private sector, away from the public sector. The policy in particular adds value over existing national policy in two ways:

- It encourages public authorities to consider the net additional employment benefits of a development and its activities.
- It allows the potential for these employment opportunities to be transferred to areas close to the East Plan areas to be considered.

Rationale

Without the East Plans there is a risk that some coastal areas will continue to have poor economic and employment prospects. Many of the areas which are facing economic and employment challenges are as a result of economic restructuring and whilst opportunities exist (particularly around renewable energy), without guidelines and plans to support restructuring and focus activities many marine economic areas will remain undeveloped and deprived. A number of possible market failures impede the ability of the local economies to restructure.

Theory of change

The East Plans place greater emphasis on the need to focus upon employment benefits for local areas which are sustainable. The focus upon sustainable employment benefits and recognition of differences in skills levels is also important as it supports employment that matches the local labour market and economic needs but also employment that brings lasting change rather than a 'quick fix' or employment opportunities that are footloose and vulnerable.

By encouraging certain activities or projects over others, the East Plans will thus influence access to and investment in stocks of capital, thereby hoping to achieve the most efficient use of available capital stocks through which to deliver the impacts associated with the objective.

This objective is strongly linked to sustainable development since there is a requirement that "economic productivity and employment benefits must be delivered in a sustainable way". There will therefore be a presumption in favour of sustainable development in the marine planning system that will maximise the net impact of local employment generation.

Logic chain

Inputs

This policy will be implemented by the regulatory authorities responsible for authorising relevant developments and activities. The East Plans' instruments will be used to effect change that contributes to this objective.

Activities

All relevant employment generating activities that can be influenced by the East Plans e.g. commercial fishing, energy production, ports and shipping.

Outputs

The outputs are the jobs created by marine and coastal economic activity, which can be further detailed as follows:

- Employment creation of all skills types.
- Employment creation that is sustainable and contributes to sustainable economic growth (is diverse and not vulnerable to economic shocks or reduced government expenditure).

Outcomes

The East Plans will result in targeted economic activity that will help to support already vibrant economies and to bring about employment focused regeneration within particular communities where there are currently identified problems. It is not anticipated that any particular economic activities/local economies will suffer as a result of the plans but there will be additional social, economic and environmental impacts including:

Employment and labour market outcomes

- Coastal economy diversity – the development of new marine industries may help to diversify local economies, making them more resilient and providing an increased number and broader range of employment opportunities for coastal communities.
- Coastal economy occupational diversity – the development of the marine sector may help to create jobs at a variety of skills levels, providing broad access to employment opportunities for coastal communities.
- Coastal economy income equality - Wage differentials between coastal areas and between coastal and non-coastal areas may be reduced where underperforming economies benefit from employment that boosts wage levels, and already vibrant economies are sustained.

Health, safety and education outcomes

- Physical and mental health improvement - a reduction in worklessness can produce a wide range of physical and mental health benefits for individuals (Waddell and Burton, 2006).
- Education opportunities – employment can provide opportunities for continued education and skills development.

Community cohesion outcomes

- Employment-derived community cohesion improvement – an increase in employment (and decrease in unemployment) can help to improve individual

identity and social status, and build social networks and perceptions of fairness (World Bank, 2013 and MMO 2014b).

Impacts

The impacts are the changes in outcomes that can be attributed to the East Plans.

A.3 Objective 3 logic chain analysis

Objective 3: To realise sustainably the potential of renewable energy, particularly offshore wind, which is likely to be the most significant transformational economic activity over the next 20 years in the East marine plan areas, helping to achieve the UK's energy security and carbon reduction objectives.

The objective specifically relates to the economic potential of offshore wind generation and the fundamental difference that it could independently make to the performance of the East Plan economy.

There is one policy under Objective 2 which supports the way in which the East Plans will influence the issues referred to above, namely:

EC3: Proposals that will help the East Plan areas to contribute to offshore wind energy generation should be supported.

Given the single sector focus of this objective, it is worth explicitly noting that the East Plans include two supportive wind energy-specific policies:

WIND1: seeks to support wind sector development by preventing developments/activity in areas that are held under a lease or agreement for lease for offshore wind energy, which may compromise the construction, operation or decommissioning of the offshore wind farm.

WIND2: seeks to support wind sector development in Round 3 zones.

Context

The offshore renewable energy sector is, relatively speaking, in its infancy. However growth in the sector is forecast to be significant, providing associated growth in employment opportunities. Further, offshore wind energy is expected to provide the largest contribution to the UK's 2020 renewable energy target (MMO, 2014).

Beyond the direct economic impact of sector activity, its development holds significant opportunity to act as a catalyst for port regeneration, the development of a skilled workforce and for the development of supporting a downstream renewable energy industry. In recognition of the scale of the opportunity, a number of Local Authorities adjacent to the East Plan areas identify offshore renewable energy as a key driver of local economic development and regeneration activity.

The spatial requirements of offshore renewable energy installation, in particular wind energy, means that careful spatial planning decisions are required in order to ensure

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efficient wind farm development that minimises the effect on other economic activities, as well as the environment.

As for the other economy-based objectives, the East Plans require that social and environmental aspects of proposals are considered alongside the economic aspects.

Rationale

In the absence of the East Plans a combination of institutional and market failures may result in insufficient support being given to the offshore wind energy sector. This may compromise the viability of offshore wind energy projects, resulting in the opportunity to generate substantial economic, social and environment benefits being foregone.

Theory of change

By supporting the development of offshore wind energy, including developments for support infrastructure, the East Plans will provide a guiding hand to the market, increasing the likelihood that the predicted development of the sector will occur.

The East Plans will encourage investment in the stock of offshore wind energy infrastructure capital. At the same time it will discourage activity that depreciates the existing stock of capital required for wind farms; most importantly access to particular spatial areas.

Increased offshore wind energy activity will deliver a range of economy-derived social impacts such as access to employment, improved skills and wages, as well as environment-based social impacts through reduced greenhouse gas emissions.

Logic chain

Inputs

This policy will be implemented by the regulatory authorities responsible for authorising relevant developments and activities. The East Plans' instruments will be used to effect change that contributes to this objective.

Activities

All relevant activities that may either support or hinder the offshore wind energy sector.

Outputs

The social outputs are:

- The jobs created by economic activity in the wider energy sector or supporting sectors, and jobs lost or foregone in activities that would have hindered offshore wind development.
- Regeneration schemes for which the wind energy sector was the catalyst.
- Reduction in England greenhouse gas emissions.

Outcomes

The East Plans will encourage the development of the wind energy sector in the East Plan areas and adjacent economies. The outputs will generate social outcomes relating to the economy and labour market, health, safety and education, community cohesion, and climate change damage.

Economy and labour market

- Increase in employment - increase in offshore wind sector and supporting industries employment
- Increase in average income – higher skilled workforce in coastal communities commands higher wages.

Health, safety and education outcomes

- Physical and mental health improvement - a reduction in worklessness can produce a wide range of physical and mental health benefits for individuals (Waddell and Burton, 2006).
- Education opportunities – employment can provide opportunities for continued education and skills development.

Community cohesion outcomes

- Employment-derived community cohesion improvement – an increase in employment (and decrease in unemployment) can help to improve individual identity and social status, and build social networks and perceptions of fairness (World Bank, 2013; MMO, in press b).
- Regeneration-derived community cohesion improvement – where regeneration projects improve one or more economic, environmental or social issue that can help to increase cohesion.

Cross-cutting

- Reduction in the value of future climate damage – resulting from a relative saving in greenhouse gas emissions per megawatt (MW) compared to non-wind energy sources in England.

Impacts

The impacts are the changes in outcomes that can be attributed to the East Plans.

A.4 Objective 4 logic chain analysis

Objective 4: To reduce deprivation and support vibrant, sustainable communities through improving health and social well-being.

The objective recognises that deprivation and sustainable community issues can be tackled directly through the social domain as well as through the economic and environmental.

There is one policy under Objective 2 which supports the way in which the East Plans will influence the issues referred to above, namely:

SOC1: Proposals that provide health and social wellbeing benefits including through maintaining or enhancing access to the coast and marine area should be supported.

Context

The coastal communities within the East Plan areas are noted as experiencing significant social deprivation including poor education attainment, low employment rates, poor health and high crime rates. This reflects the market failure that has occurred in many areas due to structural changes in the economy (e.g. reduction in fishing) and a resulting narrow economic base (e.g. dependence on seasonal tourism).

Healthy lifestyles can contribute to improved physical and mental health, thereby enhancing people's welfare. The East Plans recognise that maintaining a healthy marine environment, and access to it, is critical to encouraging healthy lifestyles. Importantly individuals may intrinsically value the marine and coastal environment even if they never visit it, and this non-use value will provide social benefit.

Rationale

Tackling social problems in coastal communities is covered by a range of policy and legislation at European, national and local level. However, in the absence of the East Plans the ability of marine and coastal area based activity to deliver social benefits and contribute to tackling deprivation and deliver sustainable communities may be severely constrained. Market failure that results in a failure to internalise the externalities of activities may lead to inappropriate development that hinders access to the coast and marine area or degrades the environment in which activity takes place. This could have a direct effect on both the physical health of coastal communities and visitors by encouraging less active lifestyles, and the mental and spiritual health of coastal and non-coastal communities by degrading the marine and coastal environment.

Theory of change

By encouraging activity that enhances access to and opportunities for recreation - such as investment in rural amenities and services, interpretation of the natural and historic environment, initiatives ancillary to economic activity, and volunteering as well as apprenticeships – the East Plans will encourage healthier lifestyles that result in improved physical, mental, social and spiritual health.

The East Plans will encourage investment in the stock of recreation-focussed capital, maintain or improve access to that capital and encourage the provision of opportunities for undertaking activities that can result in flows of social benefits.

Logic chain

Inputs

This policy will be implemented by the regulatory authorities responsible for authorising relevant developments and activities. The East Plans' instruments will be used to effect change that contributes to this objective.

Activities

Primarily activities that seek to improve access to marine and coastal recreation, as well as activities which can generate indirect social benefits.

Outputs

The social outputs are:

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- Improved coastal access
- Improved marine and coastal recreation infrastructure
- Marine and coastal based volunteering and apprenticeship opportunities.

Outcomes

The East Plans will encourage healthier lifestyles for coastal residents and visitors as well as for those who engage with the marine environment remotely. The outputs will generate social outcomes primarily linked to health, safety and education, but also community cohesion, environmental amenity and labour market and economy.

Economy and labour market

- Increase in average income – improved health can help to increase productivity which will feed through to increased incomes

Health, safety and education outcomes

- Health improvement – more active lifestyles through an increase in marine and coastal recreation, and greater access (directly or remotely) to the marine environment will result in improved physical, mental, social and spiritual health;
- Education opportunities – improved access to the marine and coastal environment can promote education and learning.

Community cohesion outcomes

- Group activity-derived community cohesion improvement – group activities in marine and coastal areas can help to build social networks and foster community cohesion.

Impacts

The impacts are the changes in outcomes that can be attributed to the East Plans.

A.5 Objective 5 logic chain analysis

Objective 5: To conserve heritage assets, nationally protected landscapes and ensure that decisions consider the seascape of the local area.

The East Plans state that this objective ‘relates to the historic environment, nationally important landscapes and seascapes. It recognises the need to consider if developments are appropriate to the area they would be located in and have influence upon and as far as possible do not compromise the value of such assets and characteristics’.

There are two main policies that indicate how the East Plans will deliver on this objective:

- SOC2:** Proposals that may affect heritage assets should demonstrate, in order of preference:
- a) That they will not compromise or harm elements which contribute to the significance of the heritage asset

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- b) How, if there is compromise or harm to a heritage asset, this will be minimised
- c) How, where compromise or harm to a heritage asset cannot be minimised it will be mitigated against
- d) The public benefits for proceeding with the proposal if it is not possible to minimise or mitigate compromise or harm to the heritage asset.

SOC3: Proposals that may affect the terrestrial and marine character of an area should demonstrate, in order of preference:

- a) That they will not adversely impact the terrestrial and marine character of an area
- b) How, if there are adverse impacts on the terrestrial and marine character of an area, they will minimise them;
- c) How, where these adverse impacts on the terrestrial and marine character of an area cannot be minimised they will be mitigated against;
- d) The case for proceeding with the proposal if it is not possible to minimise or mitigate the adverse impacts.

Context

The East Plans state that the historic sites, landscapes and seascapes have great social value for present and future generations. The East Plans discuss heritage assets and character areas separately; however there is much commonality between them for the purposes of constructing a logic model.

In relation to SOC2 the East Plans define heritage assets as ‘those elements of the historic environment such as buildings, monuments, or landscapes that have been positively identified as holding a degree of significance’ – where significance is its ‘value’ to present and future generations. The East Plans are thus in line with the recognition in the MPS that “some heritage assets have a level of interest that justifies statutory designation, the purpose of which is to ensure that they are protected and conserved...”. Although the East Plans notes that non-designated assets should also be considered. English Heritage, in relation to Rapid Coastal Zone Assessment Surveys, Historic Seascape Characterisation and other projects supported by the National Heritage Protection Plan is seeking to identify the extent of prehistoric sites and other aspects of the historic environment on coasts.

In relation to SOC3, the East Plans identify both terrestrial and marine character as holding value. It defines ‘character’ as being how an area is perceived through a combination of characteristics at the surface, within the water column and on the seabed. Specifically it notes that there are nationally designated areas (such as Areas of Outstanding Natural Beauty [AONBs]) that have marine components, and seascapes which are considered to be made up of a combination of ‘visual’ and ‘character’ components.

The pathway to social outcomes is seen as direct in the MPS. Thus; ‘heritage assets assist in strengthening social capital through engagement activities that help to become a focal point for community events, engendering a sense of belonging to a place and way of life and, as such, help foster support to safeguard these features’. The MPS also states; designated areas can bring direct economic benefits to the tourism and recreation industry through visitor footfall. These designations help

provide income to local communities, create jobs and promote health and wellbeing through maintaining high quality coastal and marine environments’.

Rationale

The MPS states ‘the significance of heritage assets must be considered in terms of the values the asset holds for current and future generations and how any proposed changes may affect the significance of the asset or its setting which may be archaeological, architectural, artistic or historic’. In relation to character the East Plans state that existing character and quality must be considered in relation to how highly it is valued and its capacity to accommodate change. The rationale for intervention is that of market failure. Heritage and landscapes will be undervalued by present generations if left to market mechanisms and the externalities should be internalised through the use of plan instrumentation.

Theory of change

Heritage assets have the potential to ‘strengthen social capital through engagement activities that help to become a focal point for community events, engendering a sense of belonging to a place and way of life and, as such, help foster support to safeguard these features’. Designated areas ‘can bring direct economic benefits to the tourism and recreation industry’. In reality both of these two beneficial impacts could occur in relation to either heritage assets or designated areas, or other non-designated character areas.

The objective is to ensure that the existing (and as yet undiscovered) stock of marine and coastal heritage assets and landscape/seascape character areas are protected from proposals that may have a detrimental impact upon them. It ensures that all heritage assets (whether formally designated or not), and valued landscape/seascape character areas are considered in the decision-making process and thus will ‘minimise or mitigate possible detrimental effects within the East Plan areas’.

By ensuring that any detrimental effects are minimised or avoided, the policies will maintain the flow of cultural and social value attached to them, as well as utilise them for community-based activities and to support economic growth.

Logic chain

Inputs

The instruments of the East Plans are used to determine desired outcomes since they influence the shape and form of development on land and at sea that can affect the quality of the heritage assets and landscapes.

Activities

All relevant activities that will be considered by the East Plans that have the potential to affect the quality of heritage assets or landscape/seascape designated or character areas.

Outputs

Fundamentally the output is the conservation of heritage assets and maintenance of character areas through the avoidance of negative environmental impacts. The

'value' attached to heritage assets and character areas should therefore be maintained. As such the outputs will be to maintain:

- The preservation of significant (highly valued) assets and areas
- The number and quality of recreational and education visits to heritage assets and character areas
- The quality of residential, commercial, recreational and heritage sites
- Community based events and activities linked to heritage assets or character areas
- Economic activity directly supported by assets and areas.

Outcomes

The relevant outcomes include the effect on economy and labour market, environmental amenity, and community cohesion.

Economy and labour market

- Avoidance of unemployment - Employment opportunities associated with managing assets and areas, and providing services to leisure visitors to assets and areas, will be maintained. The tourism and recreation sector is an important part of many coastal economies, and its continued success will ensure continued provision of employment and second order social benefits.

Environmental amenity

- Visitor benefits - Environmental amenity benefits are realised by those who visit and take part in recreation activities in and around heritage assets and character areas.
- Resident benefits - Environmental amenity benefits may be realised by residents and workers where heritage assets and character areas contribute to the visual amenity of a particular location and/or contribute to its sense of place.
- Non-use benefits - Where there is national awareness of the significance of a particular heritage asset and/or character area, the environmental amenity (in its broadest sense e.g. historical significance) may be valued by non-visitors/residents.

Health, safety and education

- Physical and mental health improvement - a reduction in worklessness can produce a wide range of physical and mental health benefits for individuals (Waddell and Burton, 2006).
- Education opportunities – employment can provide opportunities for continued education and skills development.
- Education opportunities – independent visits and events to heritage assets or to landscape/seascape areas with interpretation can provide cultural heritage and environment-based learning opportunities.

Community cohesion

- Employment-derived community cohesion improvement – employment (can help to improve individual identity and social status, and build social networks and perceptions of fairness (World Bank, 2013; MMO, 2014b)).

- Community event-derived community cohesion improvement – events and activities that occur at or in relation to heritage assets and landscape/seascape character areas can help to build social networks and foster community cohesion.

Impacts

The impacts are the changes in outcomes that can be attributed to the East Plans.

A.6 Objective 6 logic chain analysis

Objective 6: To have a healthy, resilient and adaptable marine ecosystem in the East marine plan areas.

This objective recognises that a healthy functioning ecosystem is important in its own right, that it should be resilient and adaptable in the face of pressures upon it, and able to sustain the benefits that it provides to people. The objective includes the need to prevent activities in the marine area from damaging the functioning of the marine ecosystem. It recognises the need to avoid impacts accumulating through multiple activities taking place in a particular space. Delivery of the objective should benefit both people and wildlife.

The East plans go on to explain that the objective reflects elements of the ecosystem beyond specific biodiversity interests (which are considered in Objective 7), including ultimately the benefits to people from ecosystem services that are provided and the fundamental stock of natural capital.

In relation to this a series of specific issues are set out in a bullet list under paragraph 153 of the East plans. Paragraph 155 notes that there are a range of policies and measures already in place that address these issues. The UKNEA concludes that a number of ecosystem services provided by coastal margins and the marine area are in decline.

There are two policies included under Objective 6 which determine the principal way in which the East Plan will contribute to the achievement of the objective:

ECO1: Cumulative impacts affecting the ecosystem of the East Plan and adjacent areas (marine, terrestrial) should be addressed in decision-making and plan implementation.

ECO 2: The risk of release of hazardous substances as a secondary effect due to any increased collision risk should be taken account of in proposals that require an authorisation.

Context

Whilst both policies target the avoidance of environmental impacts, they are each focused on specific issues, and as such are worth contextualising independently.

Policy ECO1: The information provided within the policy aims to highlight what needs to be done by public authorities (primarily those handling applications) to ensure that 'more is done' to identify how cumulative impacts can be managed to ensure that the

collective pressures from human activities are kept within levels compatible with achievement of good environmental status (GES). It says that the policy signals to interested parties (including applicants) that guidance [on cumulative impact assessment], of which there is much, is 'highlighted, applied and reviewed'.

Cumulative effects are already considered to some extent through existing mechanisms including strategic environmental assessment (SEA), environmental impact assessment (EIA) and Habitats Regulations assessment (HRA), and various guidance is in place to inform such assessments.

There is not currently the knowledge or evidence of how combinations of pressures affect different ecological receptors so as to enable thresholds or limits for pressures/activities to be set, or any plan-specific detail to be provided, and there is a need to undertake further research on cumulative impacts in general (MMO, 2014). Research programmes are proposed in order to address this knowledge shortfall. Ongoing MMO research is exploring the options for a cumulative effects assessment tool. Developing a better understanding of 'cumulative and combined impacts on marine ecosystems, and the likely types and impacts of adaptation measures', and how such impacts may affect the growth of marine sectors, is identified in Defra (2013) as a long-term strategic research need. The East Plans state that 'MMO will continue to collaborate ... to ensure that any developments in knowledge can be considered in future marine planning'.

The primary focus of the policy therefore appears to be on improving environmental management, by better minimising or avoiding negative environmental impacts associated with 'cumulative pressures' of multiple human activities that occur within the same area. This includes, contributing to an improved understanding of cumulative effects in order to aid future assessments and marine planning.

Cumulative impacts can arise from a range of pressures, including (but not limited to) issues around ecological and chemical water quality, hazardous substances release, air quality, invasive non-indigenous species, noise and damage and disturbance to the seabed (MMO, 2014). Whether such pressures result in a material impact depends on the sensitivity of the component of the ecosystem and the extent to which they are exposed to those pressures.

Policy ECO2: The policy discussion notes that the East Plan areas are already busy and are seeing increased competition for space. There is concern that this may result in an increased risk of collision between vessels and new static infrastructure and/or an increased risk of collision due to the displacement of vessels from established routes. In turn this increases the risk of hazardous substance release (HSR), such as chemicals and oil, due to collision.

HSR can have significant, although generally short-term and localised, impacts on the environment. Whilst the majority of incidents and accidents involving vessels (not just vessel collision) are generally minor, there have been a number that have led to actual or potential release of significant amounts of oil and/or chemicals (UKMMAS, 2010). Of nine such incidents between 2002 and 2007 highlighted in UKMMAS (2010), three were due to collisions.

The East Plans note that vessel collision risks are typically already considered, but that it is important that they are *fully considered in practice*. The Marine and Coastguard Agency is the primary source of authorisation, information and guidance for the transport of hazardous materials (Department for Transport, 2012). Policy ECO2 notes that it is anticipated that risks would be considered through existing mechanisms (e.g. environmental assessment, safety measures and contingency plans). As stated in the East Plan SEA, '*a number of strategic initiatives and individual permitting arrangements are already in place to minimise the risk of collision (e.g. COLREGS) and discharges (e.g. ship SOPEPs). It is uncertain what additional requirements are to be taken into account by applicants, the MMO or other decision makers*' (URS *et al.*, 2013). Ultimately therefore, the policy is seeking for greater weight/prioritisation to be given to the potential risk of collision (and resulting HSR) in the design of marine plans (i.e. plan policies) and individual licensing decisions, given the prevailing context of increasingly busy seas (both in terms of ship movements and infrastructure) (Hallam, 2014), and increasing size of vessels and therefore increase volume of potential HSR (UKMMAS, 2010).

Both (i) understanding overall risk from pollution incidents and how risk levels might change, and (ii) improving coordination and integration of approved best practice into national emergency plans to reduce risk and deal with any incidents effectively, have been identified as research needs by Defra (2013).

Turner *et al.* (2010) note that environmental degradation that affects coastal biodiversity and water quality is most likely to result in impacts to the flow of commercial fishing and recreation and tourism benefits. MMO (2013b) shows that the main beneficial social impacts generated by these two sectors are in relation to (i) access to employment and income, and community cohesion and character, and culture (commercial fishing) and (ii) to pursue particular lifestyles, support social networks and community stability and provide recreation-based health benefits (recreation and tourism).

Rationale

Cumulative effects and HSR can both potentially depreciate marine and coastal natural capital stocks on which flows of ecosystem services are dependent. In the absence of the East Plans, institutional failure may lead to insufficient attention being given to the potential impacts of cumulative effects, and to potential increases in ship collision risk (and in turn HSR). Where these materialise they may lead to diminished volumes and/or value of particular marine and coastal ecosystem services and to detrimental health effects from pollution, resulting in negative social impacts.

Theory of change

The East Plans emphasise the need to carry out activities and design infrastructure in ways that avoid or minimise potential environmental effects that may arise from cumulative pressures (from one or more activity) and through secondary HSRs from ship collisions. By improving planning and design in this regard, the East Plans will mitigate against these potential sources of environment derived negative social impacts. As such the East Plans will help to protect the current and future flow of social benefits derived through ecosystem services.

Logic chain

Inputs

The instruments of the East Plans are used to determine desired outcomes since they influence the location, design and nature of marine activities.

Activities

All relevant activities that will be considered by the East Plans that have the potential to cause environmental impacts (even where they are independently insignificant) and to increase ship collision risk.

Outputs

Fundamentally the output is the protection of the marine and coastal environment from the negative effects of cumulative environmental pressures and HSR. This will serve to protect current and future flows of ecosystem services.

Outcomes

The outcomes will be the social impacts generated by the protected flows of ecosystem services. These are likely to include local economy and labour market, environmental amenity, health, safety and education and community cohesion.

Local economy and labour market

- Specific sector employment – Provisioning and cultural ecosystem services support economic activity, which generates jobs and income in coastal communities. Marine economic activities most significantly associated with ecosystem service flows are commercial fishing, aquaculture and recreation and tourism.

Environmental Amenity

- Visitor - Environmental amenity benefits are realised by those who visit and take part in recreation activities in and around coastal and marine areas.
- Resident - Environmental amenity benefits may be realised by residents and workers in the marine and coastal areas.
- Non-use - People value the marine environment even when they do not directly utilise or visit it. Conservation of the marine environment holds non-use value for non-visitors/residents.

Community cohesion

- Employment-derived community cohesion – an increase in employment (and decrease in unemployment) can help to improve individual identity and social status, and build social networks and perceptions of fairness (World Bank, 2013; MMO, in press)
- Community-based community cohesion – marine and coastal recreation events and activities can help to build social networks and foster community cohesion.

Impacts

The impacts are the changes in outcomes that can be attributed to the East Plans.

A.7 Objective 7 logic chain analysis

Objective 7: To protect, conserve and, where appropriate, recover biodiversity that is in or dependent upon the East marine plan areas.

“This objective addresses biodiversity in general (rather than the specific interests of marine protected areas). It reflects the intrinsic value of biodiversity and the benefits of biodiversity to a healthy ecosystem and for people” (MMO, 2014). The objective refers to the UK Government’s commitment ‘to halting the loss of biodiversity and restoring it so far as is feasible’. Whilst it is fundamentally focussed on environmental aims it also seeks to reflect biodiversity’s ‘intrinsic value and essential contribution to human wellbeing and economic prosperity’. The East Plans note that whilst the general evidence base on biodiversity (e.g. the distribution of habitats and species) is improving, project-specific information may need to be collected to aid decision-making. Paragraph 184 signposts key existing policies and measures.

There are two policies included under Objective 7 which determine the principal way in which the East Plans will contribute to the achievement of the objective:

- **BIO1:** Appropriate weight should be attached to biodiversity, taking account of the best available evidence including on habitats and species that are protected or of conservation concern in the East Plan areas.
- **BIO2:** Where appropriate, proposals for development should incorporate features that enhance biodiversity and geological interests.

Context

The policy notes the importance of conserving ‘wider’ biodiversity, as highlighted in the MPS and Marine Strategy Framework Directive (MSFD). Providing a focus on biodiversity reflects the need to think about how nature works as a system (HM Government, 2011b), rather than focussing solely on individual environmental issues.

Whilst many aspects of the UK’s marine environment are improving other aspects continue to be degraded as a result of anthropogenic pressures. Increasing human activity in the East Plan areas is likely to exacerbate many of these pressures. It can be argued that ‘current rates of biodiversity and other natural capital depletion are a source of serious concern for sustained maintenance of human welfare’ (Turner *et al.*, 2013).

The East Plans note that conservation of biodiversity is principally achieved through the designation of protected areas¹¹ and, outside of protected areas, through relevant licensing legislation and associated EIA regulations. To ensure that decision-makers attach ‘appropriate weight’ to biodiversity, it is necessary for relevant and appropriate information on habitats, species and areas of ecological importance to be available. This includes recognising the ‘Total Economic Value’

¹¹ Including Marine Conservation Zones (MCZs), Ramsar Sites, Sites of Special Scientific Interest (SSSIs), Special Areas of Conservation (SACs), Special Protected Areas (SPAs)

(TEV)¹² of biodiversity to humans through the provision of ecosystem services, recognising that there are both 'use' and 'non-use' values.

In some instances there are design enhancements, typically unrelated to the standard mitigation of negative environmental impacts, which can be made to developments that result in specific environmental improvements. The Sustainability Appraisal of the East Plans notes that: "The policy builds on the requirements of the MPS (paragraph 2.6.1.4) to encourage design that enhances benefits to the environment, including both marine ecology and geological Interests." In this sense it will make use of opportunities to enhance biodiversity, whilst ensuring that potential negative impacts are mitigated as usual. The policy reflects Action 3.4 of the Government's biodiversity strategy (Defra, 2011b), which seeks to use the planning system to help improve the natural environment.

Rationale

In the absence of the East Plans, the current legislation and regulations will provide a level of protection to biodiversity. Whilst progress under these processes has been made towards achieving the UK's vision of maintaining biologically diverse seas, there remain a number of current, and potential future, challenges (UKMMAS, 2010). Further, opportunities to integrate biodiversity enhancement within project designs may be missed due to the traditional focus on mitigating negative impacts and delivering financially efficient investments.

Theory of change

The Sustainability Appraisal of the East Plans concludes that the BIO1 will 'reaffirm existing policy/planning mechanisms' and does not provide 'any provisions beyond the current legislative and permitting regime'. The East Plans will seek to improve access to necessary biodiversity evidence, and enhance understanding of biodiversity commitments under existing legislation. This will help decision-makers to apply 'appropriate weight' to biodiversity in licensing and other decisions. This includes stating that consideration should be given not just to the ecological components of biodiversity, but also to the ecosystem services that it supports. BIO2 provides a 'clear direction' to public authorities to 'look favourably' on proposals that include marine ecology enhancement. Further it implies that in cases where such benefits do not compromise the primary purpose of the proposed development, public authorities may 'expect' the relevant features to be included in the project design.

By supporting more informed decision-making and encouraging development-associated biodiversity improvement schemes, the policies will encourage both investment in, and discourage depreciation of, the stock of natural capital. Current and future flows of ecosystem services will therefore be protected, and potentially enhanced.

¹² TEV includes both 'use' value (e.g. the value derived through the extraction of fish, or from carbon sequestration) and 'non-use' value (i.e. value that is derived simply by knowing that biodiversity is being conserved). See: Defra (2007) An Introductory Guide to Valuing Ecosystem Services, for further details.

Logic chain

Inputs

The instruments of the East Plans are used to determine desired outcomes since they influence the location, design and nature of marine activities.

Activities

All relevant activities that will be considered by the East Plans that have the potential to cause environmental impacts (both positive and negative).

Outputs

Fundamentally the output is the protection of marine and coastal biodiversity and the protection of current and future flows of ecosystem services.

Outcomes

The outcomes will be the social impacts generated by the protected flows of ecosystem services. These are likely to include local economy and labour market, environmental amenity, health, safety and education and community cohesion benefits.

Local economy and labour market

- Specific sector employment – Provisioning and cultural ecosystem services support economic activity, which generates jobs and income in coastal communities. Marine economic activities most significantly associated with ecosystem service flows are commercial fishing, aquaculture and recreation and tourism.

Environmental Amenity

- Visitor - Environmental amenity benefits are realised by those who visit and take part in recreation activities in and around coastal and marine areas.
- Resident - Environmental amenity benefits may be realised by residents and workers in marine and coastal areas.
- Non-use - People value the marine environment even when they do not directly utilise or visit it. Conservation of the marine environment holds non-use value for non-visitors/residents.

Health, safety and education

- Health improvement – marine and coastal cultural ecosystem services enjoyed by visitors, residents and those holding non-use values can have a positive effect on mental and spiritual health.

Community cohesion

- Employment-derived community cohesion – an increase in employment (and decrease in unemployment) can help to improve individual identity and social status, and build social networks and perceptions of fairness (World Bank, 2013; MMO, in press b)
- Community-based community cohesion – marine and coastal recreation events and activities can help to build social networks and foster community cohesion.

Impacts

The impacts are the changes in outcomes that can be attributed to the East Plans.

A.8 Objective 8 logic chain analysis

Objective 8: To support the objectives of Marine Protected Areas (and other designated sites around the coast that overlap, or are adjacent to the East marine plan areas), individually and as part of an ecologically coherent network.

This objective relates specifically to Marine Protected Areas (MPAs) and other sites designated for conservation, whether they be international, European or national¹³. In addition to individual sites, it also encompasses consideration of a network of MPAs, which will contribute to a Europe-wide MPA network, including current proposals for the designation of Marine Conservation Zones (MCZs)."

There is one policy included under Objective 8 which determines the principal way in which the East Plans will contribute to the achievement of the objective:

MPA1: Any impacts on the overall MPA network must be taken account of in strategic level measures and assessments, with due regard given to any agreed advice on an ecologically coherent network.

Context

The UK is committed to putting in place an 'ecologically coherent network of MPAs' as part of a 'broad based approach to nature conservation'. Such a network is a key measure for achieving GES under MSFD. An ecologically coherent network of MPAs should take account of the relationships and interactions between marine species and their environment (OSPAR, 2006) and will deliver benefits over-and-above that of an individual MPA (JNCC, date unknown)

The East Plan areas include a number of existing and proposed MPAs. As many human activities are likely to be at least in part incompatible with the objectives of individual MPAs, allowing for projected increases in human activity whilst delivering a well managed network of MPAs is likely to be challenging.

The protection of MPAs and their features is provided for under existing statutory measures. The East Plans signpost the relevant existing legislation on MPAs. Marine planning will support and complement such measures by providing 'a framework and context for site-specific measures'. In particular marine plans can help to ensure that public authorities make an appropriate check of the effect on or interaction with other interests when designating an MPA or putting in place the management measures of an MPA.

Understanding how developments and other activity may affect the ecological coherence of an MPA network, beyond the effects on individual MPAs, is still

¹³ SSSIs, SACs, SPAs, MCZs and Ramsar Sites

developing. In turn, guidance on how decision-makers should consider MPA network effects is yet to be agreed.

The Plan policy clarifies the need for public authorities to consider both effects on individual sites and on the ecological coherence of the MPA network, with a steer that this should happen at a strategic level rather than a project level. The Sustainability Appraisal of the East Plans notes that MPA1 'augments' the existing policies and legislation.

Rationale

Delivering the East Plan areas' contribution of an MPA network whilst ensuring important marine economic development occurs in the areas is expected to be particularly challenging. In the absence of the East Plans, decision-makers may not give sufficient consideration to network level effects, and may not be aware of advances in how to consider network level effects or appropriately apply the latest guidance. This may result in impacts that undermine the ecological coherence of the MPA network, reducing its effectiveness and benefit.

Theory of change

By clarifying the need for public authorities to utilise the most current guidance on how to take account of a network of MPAs, the policy will help to ensure that the environmental benefits of a network are not undermined by a lack of, or poor quality, consideration of network effects. The potential impacts of developments and other activities, including cumulative impacts, on the MPA network (as a whole) will therefore be reduced compared to the without plan situation.

By encouraging thinking about how individual and cumulative effects of proposals may impact on the MPA network as a whole, the policy will avoid potential natural capital depreciation, and help to maximise the effectiveness of the investment through MPAs, but aiding the delivery of network-level benefits. As such, the stock of natural capital is expected to be enhanced, allowing for potential improvements in the flow of ecosystem services now and in the future.

It should be noted that given that understanding of what constitutes an ecological network, and guidance for assessing network effects, is still developing, the successful implementation of the policy is not necessarily sufficient to adequately understand and mitigate network effects i.e. such action can only be as good as the prevailing understanding and guidance on the issue.

Logic chain

Inputs

The instruments of the East Plans are used to determine desired outcomes since they influence the location, design and nature of marine activities.

Activities

All relevant activities that will be considered by the East Plans that have the potential to cause environmental impacts.

Outputs

Fundamentally the output is the protection of marine and coastal biodiversity via a network of MPAs, and the protection of all related current and future flows of ecosystem services.

Outcomes

The outcomes will be the social impacts generated by the protected flows of ecosystem services. These are likely to include local economy and labour market, environmental amenity, health, safety and education and community cohesion benefits.

Local economy and labour market

- Specific sector employment – Provisioning and cultural ecosystem services support economic activity, which generates jobs and income in coastal communities. Marine economic activities most significantly associated with ecosystem service flows are commercial fishing, aquaculture and recreation and tourism.

Environmental Amenity

- Visitor - Environmental amenity benefits are realised by those who visit and take part in recreation activities in and around coastal and marine areas.
- Resident - Environmental amenity benefits may be realised by residents and workers in marine and coastal areas.
- Non-use - People value the marine environment even when they do not directly utilise or visit it. Conservation of the marine environment holds non-use value for non-visitors/residents.

Health, safety and education

- Health improvement – marine and coastal cultural ecosystem services enjoyed by visitors, residents and those holding non-use values can have a positive effect on mental and spiritual health.

Community cohesion

- Employment-derived community cohesion – an increase in employment (and decrease in unemployment) can help to improve individual identity and social status, and build social networks and perceptions of fairness (World Bank, 2013; MMO, in press b)
- Community-based community cohesion – marine and coastal recreation events and activities can help to build social networks and foster community cohesion.

Impacts

The impacts are the changes in outcomes that can be attributed to the East Plans.

A.9 Objective 9 logic chain analysis

Objective 9: To facilitate action on climate change adaptation and mitigation in the East marine plan areas.

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The objective relates to the need to combat climate change by reducing greenhouse gas emissions (mitigation), to address the unavoidable consequences of a changing climate and by reducing related risks faced by the marine-based sectors (adaptation).

There are two policies included under Objective 9 which determine the principal way in which the East Plans will contribute to the achievement of the objective:

CC1: Proposals should take account of:

- How they may be impacted upon by, and respond to, climate change over their lifetime; and
- How they may impact upon any climate change adaptation measures elsewhere during their lifetime

Where detrimental impacts on climate change adaptation measures are identified, evidence should be provided as to how the proposal will reduce such impacts.

CC2: Proposals for development should minimise emissions of greenhouse gases as far as is appropriate. Mitigation measures will also be encouraged where emissions remain following minimising steps. Consideration should also be given to emissions from other activities or users affected by the proposal.

Context

Climate change presents a number of risks and opportunities to our economy and society, such as risk to human health and increased flood risk (Defra, 2012). Both existing and future activities have an important role to play in adapting to and mitigating the effects of climate change.

The East Plan areas have the potential to contribute to climate change mitigation through marine sector activities. Most notable is the potential to develop an offshore renewable energy industry. This is backed by the UK Government commitment to generate 15% of energy from renewable sources by 2020 as part of the UK's transition to a low carbon economy. Other opportunities include CCS and changes within the nature of the ports and shipping sectors. However, ultimately mitigation and adaptation is relevant to all marine sectors.

The coastal area of the East Plans is also particularly vulnerable to the potential effects of climate change. Most notably this includes sea level rise and potential sea surges, as it is relatively low lying, which could have serious implications for coastal communities.

There are a number of existing policies already in place which address coastal climate change issues, most notably those of Shoreline Management Plans and Local Flood Risk Management Strategies.

Rationale

In the absence of the East Plans poorly located or designed development may increase the vulnerability of communities or businesses to the potential impacts of

climate change. Further it may not take sufficient account of other activities or issues in adjacent areas resulting in indirect unintended consequences.

Theory of change

By emphasising the need for new developments to design-in climate change adaptation measures, the East Plans will help to ensure that the benefits of future activity are resilient to the effects of climate change. Further, the East Plans adds the need to consider potential effects from the proposal on the climate vulnerability of other activities, helping to foster decision making that maximises the net benefits. As such, the East Plans will ensure that capital stocks from which flows of benefits are generated are not depreciated by climate change effects, directly or indirectly.

Logic chain

Inputs

The instruments of the East Plans are used to determine desired outcomes since they influence the location, design and nature of marine activities.

Activities

All relevant activities that will be considered by the East Plans that have the potential to be affected by climate change impacts, cause the vulnerability of other activities to climate change impacts to be affected, or result in the emission of greenhouse gasses.

Outputs

The outputs of the policies will be climate resilient infrastructure/developments and a net reduction in greenhouse gas emissions relative to the baseline.

Outcomes

The outcomes will be the social impacts generated by the protected flows of benefits. These are likely to occur through the protection of economic and non-economic activity, as well as the protection of coastal communities. Beneficial outcomes can be expected across local economy and labour market, environmental amenity, health, safety and education and community cohesion.

Employment and labour market outcomes

- Coastal economy – resilient employment opportunities for coastal communities.

Health, safety and education outcomes

- Physical and mental health improvement – avoidance of worklessness as a result of climate change impacts causing economic contraction in particular sectors or coastal communities. Avoidance of worklessness can protect a wide range of physical and mental health benefits for individuals (Waddell and Burton, 2006). Avoidance of stress as a result of potential increase flood risk of coastal communities.

Community cohesion outcomes

- Neighbourhood community cohesion – more climate resilient coastal economies and communities will help to avoid a breakdown in cohesion that

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may occur if social networks and economic opportunities deteriorate in the face of unplanned changes that occur due to the effects of climate change.

Impacts

The impacts are the changes in outcomes that can be attributed to the East Plans.

Annex B: Scoping of Data and Indicator Sources

Indicator/Dataset	Description	Spatial level	Social impact				
			Economy / labour	Environmental amenity	Health, safety, education	Community cohesion	Governance
House Price Index (Land Registry)	Compares the average house price today to what it was in January 1995, with the index set then at 100. http://www.landregistry.gov.uk/public/house-prices-and-sales	National to district.	x	x			
Business Register and Employment Survey (BRES) (ONS)	Range of data available on labour market indicators from Nomis or through UK Data Service. BRES is regarded as the most comprehensive source of employment statistics for small spatial scales. BRES is ONS Official Statistics. Limitations: marine sectors cannot be fully mapped using available 4-digit SICs. Notably the offshore renewables sector. Commercial fishing data is significantly underestimated when compared to MMO Annual Fishing Statistics. http://www.ons.gov.uk/ons/guide-method/method-quality/specific/labour-market/business-register-and-employment-survey--bres-/index.html	National to Ward level	x				
Annual Population Survey (ONS)	APS is a combined survey of households in GB providing social and socioeconomic variables for sub-regional (LA) areas. Datasets produced quarterly, with each containing 12 months of data. Topics covered in the main APS dataset: Country of birth by white/ethnic minority Disability level by economic activity Economic activity rate by age Economically inactive by age Employment rate by age Full-time and part-time employment Ethnic group by age, by industry of employment, by occupation of employment, by economic activity Health problems by economic activity Hours worked weekly Industry of employment Job-related training National identity and Welsh language Nationality by white/ethnic minority Occupation major group of employment Occupation sub-major group of employment Public and private sector employment Qualifications (GCSE) by age Qualifications (GCSE) of economically active Qualifications (NVQ) by age Qualifications (NVQ) of economically active	LAs	x				

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Indicator/Dataset	Description	Spatial level	Social impact				
			Economy / labour	Environmental amenity	Health, safety, education	Community cohesion	Governance
	Qualifications (NVQ) of employed Self-employed and employees Taught adult learning by disability level and by age Unemployment rate by age						
Annual Population Survey – subjective wellbeing	Estimates of people's views about their own wellbeing are provided as well as estimates for: key demographic characteristics (such as age, sex, ethnic group), different geographic areas (regions) and countries within the UK, aspects which are considered important for measuring national wellbeing (such as personal relationships, health and work situation). Classified as 'experimental statistics', with first publication in 2013. Whilst future publications expected, methodology may be subject to change. Sample size approx. 165,000. http://www.ons.gov.uk/ons/rel/wellbeing/measuring-subjective-wellbeing-in-the-uk/first-annual-ons-experimental-subjective-well-being-results/first-annual-experimental-subjective-well-being-results.html	Regional			x		
Annual Survey of Hours and Earnings	The ASHE contains a small number of variables for each individual, relating to wages, hours of work, pension arrangements, and occupation and industrial classifications. There are also variables for age and date of birth. Because the data are collected by the employer, there are also variables relating to the organisation employing the individual. These include employment size and legal status (e.g. public company). Finally, a variable relating to pay setting (i.e. whether this is agreed with trade unions) exists. Sample 145,000 to 185,000. Full access only available via 'secure access' with UK Data Service, which requires justification and face-to-face training. Local Authority level available via ONS. http://www.ons.gov.uk/ons/rel/ashe/annual-survey-of-hours-and-earnings/index.html	Local Authority	x				
National Well-being Wheel of Measures (ONS)	40 measures across 10 key themes of personal wellbeing, relationships, health, what we do, where we live, personal finance, education and skills, the economy, governance and the natural environment. http://www.ons.gov.uk/ons/interactive/well-being-wheel-of-measures/index.html	National	x	x	x	x	x
	Understanding Society. Annual survey on the social and economic circumstances and attitudes of people living in 40,000 UK households. Questions range across: finances, expectations,	Subject to sample (40k)	x	x	x	x	x

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Indicator/Dataset	Description	Spatial level	Social impact					
			Economy / labour	Environmental amenity	Health, safety, education	Community cohesion	Governance	
	health, relationships, etc. https://www.understandingsociety.ac.uk/ Datasets can be access through UK Data Service							
	The Community Life Survey (Cabinet Office) is a major survey of adults in England, aiming to track the latest trends and developments across areas that are key to encouraging social action and empowering communities. Tracks measures that are key to understanding our society and local communities, including: Volunteering and charitable giving; Views about the local area; Community cohesion and belonging; Community empowerment and participation; Influencing local decisions and affairs; and, Subjective well-being. http://communitylife.cabinetoffice.gov.uk/	England; subject to sample (6.6k in 2012/13)				x		
	General Lifestyle Survey. Began collecting in 1971 – finished in 2012. The main topics of the survey are: Smoking; Drinking; Households, families and people; Housing and consumer durables; Marriage and cohabitation; Pensions; and General health. Source: ONS	Subject to sample			X	X		
Integrated Household Survey (ONS)	Largest social survey produced for ONS based on core questions to 350,000 households. Covers range of topics including education, migration, housing, religion, ethnicity, accommodation, income work, looking for work and education. http://www.ons.gov.uk/ons/guide-method/method-quality/specific/social-and-welfare-methodology/integrated-household-survey/index.html https://www.gov.uk/government/publications/sustainable-development-indicators-sdis	Subject to sample	x	x	x	x	x	
Sustainable Development Indicators (Defra)	New sustainable development indicators (SDIs) provide an overview of national progress towards a more sustainable economy, society and environment, and complement the National Wellbeing Measures. 12 headline and 23 supplementary indicators (25 and 41 measures). https://www.gov.uk/government/publications/sustainable-development-indicators-sdis	National	x	x	x	x		
Health and Social Care Information Centre (NHS)	Health related indicators based on demographic profile of a local area. Allows for comparison to other areas. Covers a wide range of factors that influence health inequalities including unemployment, poverty, crime and education in a 'local basket of inequality indicators'. http://www.hscic.gov.uk/indicatorportal/ https://indicators.ic.nhs.uk/webview/	SOA (lowest level)			x			

Monitoring social outcomes of marine plans

Indicator/Dataset	Description	Spatial level	Social impact				
			Economy / labour	Environmental amenity	Health, safety, education	Community cohesion	Governance
Labour Force Survey	The Labour Force Survey (LFS), which began in 1973 as an annual survey, is a unique source of articulated information using international definitions of employment and unemployment and economic inactivity, together with a wide range of related topics such as occupation, training, hours of work and personal characteristics of household members aged 16 years and over. http://www.ons.gov.uk/ons/about-ons/get-involved/taking-part-in-a-survey/information-for-households/a-to-z-of-household-and-individual-surveys/labour-force-survey/index.html	LA					
Annual Monitoring Report (English Local Authorities)	Measure performance of the Development Plan for each Local Authority. A systematic monitoring tool that enables the authority to understand the wider social, economic and environmental issues affecting the area. Uses a series of nationally derived monitoring objectives, indicators and targets that aim to provide information at a local level. A range of indicators including Contextual Indicators, Output Indicators (national and local) and Significant Effects Indicators. Notably reduced in scope recently.	LA	x	x	x		
ONS Local Profiles – Neighbourhood Statistics	Local Profiles cover a range of topics to enable the economic, social and environmental character of a Local Authority area. The profiles cover a range of issues including poverty, demography, economic context, employment, enterprise, housing, inclusion and skills. Local Profiles are collated indicators from other sources. www.neighbourhood.statistics.gov.uk	LA	x	x	x		
Indices of Multiple Deprivation (DCLG)	Produced every 3 years. Deprivation in reference to: income; employment; health; education and skills; barriers to housing and services; crime; living environment. https://www.gov.uk/government/collections/english-indices-of-deprivation	Down to SOA	x	x	x		
Seascape Character Area Assessments (MMO 2012)	Qualitative descriptions of 10 marine character areas covering the East Plan Area. Provides an assessment (qualitative) and description of the character of the area in terms of key features, attributes and uses/ designations. Do not currently provide useful data or indicators given the qualitative nature of the assessment. However, for future marine plan areas it may be possible to make small alterations to the methodology in order to generate indicators that could be used for monitoring purposes. http://www.marinemangement.org.uk/marineplanning/areas/documents/east_seascape.pdf	10 East Marine Plan character areas		x			

Monitoring social outcomes of marine plans

Indicator/Dataset	Description	Spatial level	Social impact				
			Economy / labour	Environmental amenity	Health, safety, education	Community cohesion	Governance
National Character Areas (Natural England)	<p>Nine broad Character Areas covering England divided into a further 159 distinct natural areas. Each is defined by a unique combination of landscape, biodiversity, geodiversity and cultural and economic activity. Their boundaries follow natural lines in the landscape rather than administrative boundaries.</p> <p>Unlikely to provide useful data or indicators given the qualitative/descriptive nature of the assessment. Useful for context of the East Plan area.</p> <p>http://www.naturalengland.org.uk/publications/nca/default.aspx#profiles</p>	159 defined areas.		x			
Marine Strategy Framework Directive (MSFD)	<p>A legislative framework for an ecosystem-based approach to the management of human activities to support sustainable use of marine goods/services. The overarching goal of the Directive is to achieve 'Good Environmental Status' (GES) by 2020 across Europe's marine environment.</p> <p>The MSFD has 11 high level descriptors of GES including protecting biodiversity, maintaining fish populations, limiting concentrations of contaminants, etc. No social indicators have yet been identified.</p>	Various		x	x		
Ocean Health Index	<p>Assessment of the world's oceans using data against 10 Goals which provide key benefits of health ecosystem management. The Goals include: fishing opportunities, biodiversity, coastal protection, carbon storage, clean waters, food provision, coastal livelihoods and economies, natural products, sense of place and tourism and recreation. Scores against these 10 Goals are combined to provide an average per country. Covers data for countries with marine ecosystems up to 200 nautical miles from coast.</p> <p>http://www.oceanhealthindex.org</p>	Country		x			
Monitor of Engagement with the Natural Environment (Natural England)	<p>Survey commenced in 2009 to provide trend data on visits and use of the natural environment in England. Includes details on the type of destination, the duration of the visit, mode of transport, distance travelled, expenditure, main activities and motivations and barriers to visiting. Potentially useful: visits to a beach/coast; subjective health benefits of the visit; learning outcomes of a visit</p> <p>A quota sampling method is used to ensure that results are representative of the English adult population.</p>	Subject to sample		x	x		

Monitoring social outcomes of marine plans

Indicator/Dataset	Description	Spatial level	Social impact				
			Economy / labour	Environmental amenity	Health, safety, education	Community cohesion	Governance
	Used in ONS wellbeing: % who access the natural environment in the last week. http://publications.naturalengland.org.uk/publication/2248731?category=47018						
Watersports participation survey (BMF)	Annual report commissioned by BMF, MCA, RNLI, RYA, BCU and MMO details participation and ownership for 12 boating activities in 2011 and reports trends over ten years. The report includes demographics, frequency, home and abroad participation, location and household boat ownership. http://www.britishmarine.co.uk/what_we_do/statistics_market_research/current_projects/watersports_participation.aspx	Regional / coastal		x	X		
Day Visit Survey and Overnight Tourism survey (Visit England)	The Great Britain Tourism Survey (GBTS) is a national consumer survey. The first objective of GBTS is to provide measurements of tourism by residents of Great Britain, in terms of both volume and value. The second is to collect details of the trips taken and of the people taking them. The Day Visit Survey aims to measure the volume, value and profile of Tourism Day Visits and 3 hour+ Leisure Visits taken by GB residents to destinations in England, Scotland, Wales and Northern Ireland. http://www.visitengland.org/insight-statistics/major-tourism-surveys/dayvisitors/	Published by country Available for lower spatial areas		x	X		
Active People Survey (Sport England)	The <i>Active People Survey</i> is a large scale survey (165,000 adults age 14 and over in Active People Survey 7) of sport and active recreation undertaken in England amongst adults (16 years and over). The survey provides the largest sample size ever established for a sport and recreation survey and allows levels of detailed analysis previously unavailable. It identifies how participation varies from place to place, across different sports, and between different groups in the population. The survey also measures: the proportion of the adult population that volunteer in sport on a weekly basis, club membership; involvement in organised sport/competition; receipt of tuition or coaching; and overall satisfaction with levels of sporting provision in the local community. http://www.sportengland.org/research/about-our-research/active-people-survey/			X	X		
Annual Fisheries Statistics (MMO)	Annual stats re vessels and employment and landings by country and admin port. http://www.marinemanagement.org.uk/fisheries/statistics/annual.htm		x				

Monitoring social outcomes of marine plans

Indicator/Dataset	Description	Spatial level	Social impact				
			Economy / labour	Environmental amenity	Health, safety, education	Community cohesion	Governance
Economic Survey of UK Fishing Fleet (Seafish)	The economic survey provides a annual statistics of the financial and operational performance of the UK fleet. Includes revenue, profit, etc. presented by fleet segment. www.seafish.org		x				
Marine Accident Investigation Branch	Number of HSR events as a result of ship collisions Number of accidents at sea All accidents are reportable by law to the MAIB. Not all accidents require full investigation, however all are recorded in database of accidents with basic information captured. Data available at location of incident. http://www.maib.gov.uk/publications/investigation_reports/reports_by_year.cfm	Data available at incident location.			x		
Bi-annual marine industry trends report	BMF conducts a survey bi-annually to measure current business performance and trends in the marine industry over the last six months and future expectations. Reports are prepared in May and November. http://www.britishmarine.co.uk/what_we_do/statistics_market_research.aspx	National	x				
Digest of UK Energy Statistics (DECC)	Contains performance statistics on all relevant renewable energy sources in the United Kingdom. https://www.gov.uk/government/collections/digest-of-uk-energy-statistics-dukes	National					

Annex C: Marine Sector Definition by SIC Code

This annex details the Standard Industrial Classification of Economic Activities (SIC) which define the marine sector, as presented in Pugh (2009). Even at their most detailed, many SIC codes contain both marine and non-marine activities (e.g. SIC 08.12 Operation of gravel and sand pits; mining of clays and kaolin, which includes marine aggregate dredging). As such it is not currently possible to obtain a comprehensive SIC-based definition. This is identified elsewhere in the report as a recommended research priority for MMO. The SICs identified as most appropriate for consideration are those described by Pugh (2008) as being 'substantially marine'. Other SICs also contain marine activities, but are likely to contain a higher proportion of non-marine activities; these have not been included.

SIC code	SIC definition
03.11	Marine fishing
03.21	Marine aquaculture
06.10	Extraction of crude petroleum
06.20	Extraction of natural gas
09.10	Support activities for petroleum and natural gas extraction
10.20	Processing and preserving of fish, crustaceans and molluscs
30.11	Building of ships and floating structures
30.12	Building of pleasure and sporting boats
33.15	Repair and maintenance of ships and boats
50.10	Sea and coastal passenger water transport
50.20	Sea and coastal freight water transport
52.22	Service activities incidental to water transportation
52.24/1	Cargo handling for water transport activities
77.34/1	Renting and leasing of passenger water transport equipment