Marine Management Organisation

South Inshore and South Offshore Marine Plan Areas: South Plans Analytical Report (SPAR)

September 2013

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1.0 Introduction

1.1 Purpose

The draft South Plans Analytical Report (SPAR) is a synthesis and summary of the evidence and issues for the South Inshore and South Offshore marine plan areas. The information in this draft report has been drawn together to set out the evidence and identify the issues relevant to these marine plans and to inform the next steps in the planning process, such as generating a vision, objectives and policies. The work to produce the report and supporting evidence has been informed by discussions with a range of stakeholders.

This draft version of the report has been released for formal consultation, from Monday 23 September to Friday 1 November (see below for more information on the consultation and how to respond). This draft report is also intended to be used as part of the supporting material for a series of workshops that will be held along the South coast in the first three weeks of October (see below for more information). **Please note that this draft report is intended to invoke comment from stakeholders and inform discussion, including on issues, the overall evidence or the approach.** It is anticipated that the consultation and associated discussion will refine the list of key issues for marine planning in the South marine plan areas. In keeping with stakeholders' views[1], a single report has been produced covering both the East Inshore and East Offshore plan areas together.

1.2 Overview and general approach

We are committed to marine plans that are based on the best currently available evidence. To ensure we are gathering this evidence as widely as possible, we have drawn together the range of relevant evidence but also highlighted key issues emerging from the evidence (please see below for more information on the evidence used). This should inform discussion of key issues and provide the basis for the next steps in the planning process, helping us to establish a clear vision and objectives for the plan areas. In writing this draft report, it was considered important to pull together and summarise relevant information on behalf of stakeholders and to begin to draw out key issues for the South marine plan areas.

In so doing, we have drawn upon our experience from a similar step in the process of developing the East Inshore and East Offshore marine plans to produce the 'East Inshore and East Offshore Marine Plan Areas Evidence and Issues Report'[2]. Based upon stakeholder feedback and our increased understanding of where and how marine planning can add most value, we have revised the format, style and depth of analysis and summation that has gone into the report, to present something more succinct and accessible to stakeholders. The report is supported by detailed evidence (referred to throughout). We have also paid more attention to trying to identify the key issues early, so that these can be discussed, agreed and taken through the planning process. Key issues can be thought of as those issues that are likely to drive or be subject to significant change in the plan areas during the life of

[1] MMO (2012) Statement of Public Participation workshop summary report www.marinemanagement.org.uk/marineplanning/areas/documents/south_workshops_summary.pdf
[2] MMO (2012) East Inshore and Offshore Marine Plan Areas Evidence and Issues Report www.marinemanagement.org.uk/marineplanning/areas/east_issues.htm

the plan and which can be addressed by marine planning to a significant degree (including to complement other measures)[3].

Chapter 2 in this report presents the evidence as it relates to individual sectors and topics and identifies the potential key issues for each sector or topic. These individual sections follow a similar format, which is as follows:

- Introductory text, to provide context. This describes the sector or topic, in broad terms
- Current Situation. The description of the existing activity or distribution relating to a sector or topic
- Current Policy. The discussion of the national and sub-national policy influencing the development of that sector or topic
- Future Trends. The discussion of the likely future development of the sector or topic and the factors influencing that
- Potential Key Issues. The most important issues suggested by the evidence for that sector or topic
- Interactions with Sectors. Identification of how the sector or topic interacts with others
- Issues for Sustainability. Where there may be issues that have a wider economic, social or environmental aspect, such as a cumulative impact when considered with other sectors or topics, these are identified

As each sector and topic is different, both in the level of evidence available (for example some may not have relevant national or sub-national policy) and in how this translates to issues, the format above is a guide; some sectors or topics may not use all of these headings.

The MMO has analysed a range of evidence and sources of issues including:

- data and information associated with the South Inshore and South Offshore marine plan areas
- information and issues collated from stakeholders
- national plans and policies that influence the management of the marine areas
- local plans and policies that influence the management of the marine areas.

The range of evidence used is outlined below and in the individual topic and sector sections in Chapter 2, drawing on information from discussion with stakeholders and from the recent Strategic Scoping Report[4] . In line with the Government's Marine Policy Statement (MPS) and high level marine objectives[5], this report covers all the key activities that take place in the marine area, as well as all the environmental, social and economic considerations that need to be taken into account in marine planning. It should be noted that the suggested issues are based:

- directly on specific points of evidence and
- indirectly on a reading of the evidence as a whole for that sector
- on interactions between sectors

[3] As opposed to 'non key issues for planning' that marine planning does not need to resolve, largely because they are addressed by other existing measures.
[4] MMO (2013) Strategic Scoping Report www.marinemanagement.org.uk/marineplanning/key/ssr.htm
[5] Defra (2011) Marine Policy Statement, p11

- between sectors and wider issues

Therefore, many of the issues are a synthesised view rather than being directly attributable. While these have been considered in relation to marine planning, the lists of issues have not been 'filtered' as it is important for stakeholders as well as the MMO to form a view on which are key to marine planning. To help that assessment, the issues have been analysed to derive an initial list of key issues, grouped into themes. The impacts of the issue, relevant sectors driving the issue, and those sectors or interests impacted have also been identified, with some suggested responses of how planning could deal with these issues included by way of example. Further to the assessment, Chapter 3 provides an overview and discussion of all the issues taken together.

The MMO is working with local authorities and other coastal managers and regulators to ensure effective integration between marine plans and others, including terrestrial plans and, in doing so, contribute to achievement of integrated coastal zone management (ICZM)[6]. This co-operative approach has considered the many existing plans and policies relevant to the South marine plan areas and analysed those of most relevance, such as local development frameworks. The MMO will continue to work with interested parties to understand and address the implications for planning and management at the coast. 1:1.3 Evidence base for marine planning

1.3 Evidence base for marine planning

Evidence (both spatial data and information reports) is essential to the development of effective marine plans, to better understand activities, resources and the ecosystem in the South marine plan areas. Data and information from a wide range of stakeholders, partners and organisations has been collated prior to initiating marine planning in the South marine plan areas. The evidence base on which the SPAR is based and that can be viewed spatially, can be accessed through the marine planning portal[7].

Evidence will be used throughout the planning process from understanding issues in the South marine plan areas, to analysing potential solutions and drafting supporting policies.

New evidence commissions for the South marine plan areas

Where possible we have utilised existing research to inform marine planning. For example, through the utilisation of key resource areas work completed by The Crown Estate. This work defines where resources for certain activities are located in order to predict the potential future spatial locations of interest for marine developments. This analysis has been utilised in the SPAR and will be drawn upon throughout the planning process.

When the MMO began planning in the South marine plan areas in April 2013, a number of evidence projects were commissioned to support analysis and decision making, particularly where experience from the development of marine plans in the East highlighted gaps in the evidence base, or to make recommendations on how to

[6] Defra (2011) Marine Policy Statement, p13
[7] planningportal.marinemanagement.org.uk/

integrate wider considerations into the planning process, such as co-location and cumulative effects. The commissions align with the MMO's Strategic Evidence Plan (SEP) which sets the focus for all projects that the MMO commissions until 2015, including priorities for evidence development, and is published on the MMO website[8].

A summary of the commissions is listed below, split into data (spatial descriptions or quantification) and information (reports and recommendations).

Data projects

Several data projects have been commissioned to support the marine planning process and development of policies in the South marine plan areas. These projects specifically look at spatial distribution of a range of activities in the South marine plan areas as well as defining character and unique features that should be accounted for. These projects include:

- Character assessment for the South Inshore and South Offshore marine plan areas. The project conducted a desk based study using existing datasets, field surveys including boat work and stakeholder engagement to define the character areas (MMO 1037);
- Definition of the spatial areas in which there is potential for aquaculture developments. This has been completed for shellfish, seaweed, crustacean, bottom culture bivalve shellfish, trestle/bag culture shellfish, rope grown bivalve shellfish, macro algae production, hatchery reared lobster (re-stocking) and marine finfish cage culture species. The project also includes an assessment of potential economic returns from development in these areas (MMO 1040);
- Definition of the spatial trends in shipping activity with a focus on the South marine plan areas. This is based on raw Maritime and Coastguard Agency Automated Identification System (AIS) data (MMO 1042);
- A national project to collate and improve data on spatial trends in marine recreational activity. This project has a specific focus on the South marine plan areas. The types of activities covered by this project include surfing, diving and sailing (MMO 1043);
- Spatial models of essential fish habitat to define essential fish habitats in the South marine plan areas. This includes migration routes, spawning and nursery grounds (MMO 1044).

Several national projects have been procured to support the MMO's strategic evidence plan [9] and develop the MMO's understanding of different factors that should be taken into account in planning in the South marine plan areas. These include:

- An evaluation of the distribution, trends and value of inshore and offshore fisheries in England. This includes assessment of the nature, location, and socio-economic value of fishing activities around England. A further key output is a series of recommendations and identification of key knowledge gaps that need to be filled to improve the dataset in the future (MMO 1011);

[8] www.marinemanagement.org.uk/evidence/
[9] ibid

- Production of an updated assessment of seabird density in English waters and an associated sensitivity of these species to marine development (MMO 1034).

Information and reports

In addition to the data projects, several reports have been commissioned that supply information on marine activities, map trends in activities or to specifically provide recommendations on how to approach the marine planning process. These projects include[10]:

- Evaluation of the potential for co-location of activities and interests in marine plan areas to inform a co-location matrix (MMO 1010);
- As a follow on to the initial co-location project, scoping of a robust strategic assessment tool for co-location of activities in marine plan areas has been completed. This project looks at methods of considering co-location in marine planning, licensing, marine conservation and fisheries enforcement teams across the MMO (MMO 1049);
- Collation of all available marine, social and economic data and outlining methods and tools to apply this data to decision making within an ecosystem approach (MMO 1012);
- Assessment of the social impacts of fisheries, aquaculture, recreation, tourism, and marine protected areas (MPAs) in marine plan areas in England. The project will outline key knowledge gaps and recommend improvements to the evidence base (MMO 1035);
- Compilation of information on tourism relevant to marine planning in the South marine plan areas. In addition the project will outline potential indicators, ecosystem approach considerations and sustainable development recommendations (MMO 1038);
- Review of the past trends and projections for the next 6 and 20 years for all activities identified in chapter 3 of the Marine Policy Statement (MMO 1039);
- Production of an economic baseline assessment of the South Coast based on socio-economic information and highlight critical gaps where they occur (MMO 1050).

Potential future commissions

There is potential to commission further projects to assist in development of marine plans in the South marine plan areas and beyond. Any further projects will need to add to the understanding of the evidence and issues presented in this report, as well as align with the MMO's SEP.

1.4 How to Respond

The information in this draft report has been drawn together to set out the evidence and identify the issues relevant to these marine plans and to inform the next steps in the planning process. This document has been informed by policy analysis, data and stakeholder input and in order to gain feedback on it, we are carrying out a formal consultation on the South Plan Analytical Report.

In order to focus your comments on the South Plan Analytical Report, please find below some questions to structure your response:

1. Does the evidence available provide an accurate picture of the current and future situation for marine activities in the South plan areas?

2. Are there any pieces of additional evidence that you consider should be included at this stage that provide new information?

3. Does the content of the report represent the issues for the South plan areas you would like marine planning to address? If not, what is missing and can you provide evidence to support the additional issues?

4. Do the themes adequately represent the issues? And do you have anything to add with regards how the MMO may address the issues?

5. How do you see these issues changing over the next 20 years?

The formal consultation will close at 5pm on Friday 1 November.

We want to ensure we have the best available evidence and understanding of the issues from the South marine plan areas, and encourage anyone who has queries or suggestions on this report to respond to the formal consultation via https://www.connect.marinemanagement.org.uk/consultations/consult-south-analytical-report or planning@marinemanagement.org.uk.

Alternatively you can respond via post to:
Marine Management Organisation
Marine Planning Team
Lancaster House
Hampshire Court
Newcastle upon Tyne
NE4 7YH

Following the formal consultation, we will review all the responses and produce a summary report of the responses. We will take into account all comments made and update, revise or clarify the evidence wherever needed and publish a revised version of the South Plan Analytical Report.

This formal consultation is in accordance with the requirements of Schedule 6 of the Marine and Coastal Access Act 2010 (consultation on matters to be included in the draft plan) and the Statement of Public Participation for the South Inshore and Offshore Marine Plan Areas,

2.0 Sector and Topic Evidence and Issues

2.1 Ocean Climate and Acidification

Ocean climate is largely defined by its temperature, salinity, ocean circulation and the exchange of heat, water and gases (including CO^2) with the atmosphere. The functioning of the marine ecosystem is highly dependent on changes to both ocean climate and acidification[11].

There is a growing evidence base that shows that climate change is already having an impact on the marine environment across all components that contribute to the government's vision for clean, safe, healthy, productive and biologically diverse oceans and seas. Good estimates of what could happen in the future marine environment and how this might impact issues as diverse as flooding, habitat conservation and food safety are becoming of increasing importance for adaptation and risk planning[12].

Current situation

The air temperature in central England has risen by about 1°C since the 1970s[13]. This increase is, at least in part, driven by greenhouse gas emissions from human activities.

Table 1 shows projected air temperature and precipitation by the 2050s, over the south west approaches and eastern channel marine regions, which overlap with the South marine plan areas. Changes in air temperature over marine regions are larger in the south than the north, as they are influenced by their proximity to the continent, which warms faster than the oceans. Increases could be in the region of 1.2 to 3.2°C[14]. The gradient of change in precipitation is also larger in the south than the north. By the 2050s, the South marine plan areas are projected to experience wetter winters and drier summers, with increases of up to about 30% in winter, and decreases of approximately 45% in winter[15].

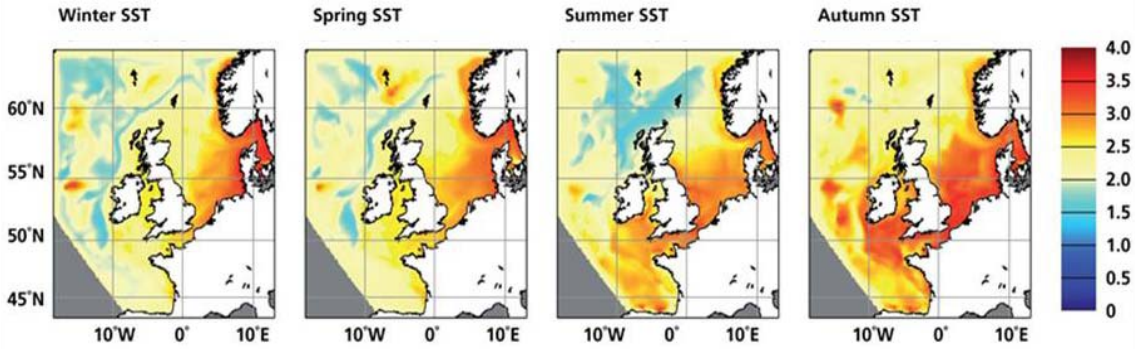
Table 1 Changes in winter- and summer-mean temperature and precipitation, averaged over marine regions, by the 2050s under the Medium emissions scenario, taken from UKCP09[16].

[11] Birchenough S.N.R., Townhill, B., Pinnegar, J.K. and Buckley, P. (2013) Marine Climate Change: Adaption Report. Applied science to support the MMO under the Defra Strategic Evidence and Partnership Fund (SEPF).
[12] UK 2012 Climate Change Risk Assessment Summary: Marine and Fisheries. http://randd.defra.gov.uk/Default.aspx?Module=More&Location=None&ProjectID=15747
13 Jenkins et al, 2009. UK Climate Projections: Briefing report.
14 Jenkins et al, 2009. UK Climate Projections: Briefing report.
15 Jenkins et al, 2009. UK Climate Projections: Briefing report.
[16] UKCP09 projections assign a probability to possible climate change outcomes to demonstrate the probability of climate change being less than or greater than a certain value, using the cumulative distribution function. The climate change at the 50% probability level is that which is as likely to be exceeded as not exceeded, i.e. the central estimate. The projections presented in table 1 are between two probability levels (10% certain that very unlikely to be less than, and 90% certain that very likely to be less than)16.

	Mean air temp winter °C	Mean air temp summer °C	Precipitation winter %	Precipitation summer %
South west Approaches	1.2 to 2.9	1.3 to 3.2	0 to 28	-43 to -2
Eastern English Channel	1.2 to 3.3	1.4 to 3.4	1 to 31	-49 to 0

Sea surface temperatures are increasing, with waters around the UK warming by around 0.7°C over the last three decades. UK Climate Projections 2009 (UKCP09)[17] are the latest set of climate projections produced to cover the UK and its shelf seas. Under the medium emissions scenario[18], the UK's shelf seas are likely to experience warming of between 1.5 and 4°C by the end of the 21st century. Notable increases are expected in the South marine plan areas, particularly in the east, of approximately 2.5 to 4°C. As shown in figure 1, it is expected that the largest increases will be experienced in autumn. The strength and duration of stratification[19] is also expected to increase across all NW European shelf seas[20].

Figure 1 Seasonal increases in sea surface temperature (°C) from present to 2080s – medium emissions scenario (Lowe *et al.*, 2009)[21].



Increased atmospheric carbon dioxide and uptake in the ocean, has resulted in the ocean becoming more acidic since pre-industrial times (decreasing by 0.1 pH unit)[22]. This rate of change is faster than anything experienced in the past 55 million years. It is predicted that acidification will continue as carbon dioxide emissions increase[23,24],

[17] Murphy, J.M., et al. 2010 UK Climate Projections Science Report: Climate change projections Version 3. Met Office Hadley Centre, Exeter, UK.
[18] UKCP09 considered the effects caused by low, medium and high CO_2 emissions scenarios, however only a medium emission scenario is available for sea surface temperature.
[19] Water stratification occurs when water masses with different properties (such as salinity, temperature and density) form layers which act as a barrier to water and nutrient mixing. Less dense, warmer water lay above denser, colder waters; the boundary between is known as the thermocline.
[20] Jenkins et al, 2009. UK Climate Projections: Briefing report.
[21] Lowe, J.A., et al., 2009 UK Climate Projections science report: Marine & coastal projections. Met Office Hadley Centre, Exeter, UK.
[22] Townhill, B.L., et al, 2013, Marine Management Organisation Climate Change Adaptation Reporting - Feeder Report A report to the MMO.
[23] Defra, 2010 Charting progress 2: Chapter 6 Climate change Published by Defra on behalf of the UK Marine Monitoring and Assessment Strategy community, London.

with decreasing pH levels of around 0.1 units in the 2020s, and a decrease between 0.25 and 0.47 units by 2100[25], depending on the emission scenario used. Resulting ocean acidification could have negative consequences for ecosystem processes and species; particularly those organisms with calcareous shells including commercially important shellfish species[26]. Ocean acidification in turn reduces the ability of the oceans to absorb carbon dioxide, and therefore buffer the effect of global warming. Climate warming may increase rates of pelagic carbon cycling, making less carbon available to the benthic systems resulting in reduced benthic biomass with potential knock on effects for marine food webs. In addition climate change may cause an increase in areas or periods of low oxygen in the oceans.

Sea level around the UK has risen by about 1millimetre (mm)/ year in the 20th century, with this rate of increase rising since the 1990s[27]. This is in response to higher temperatures resulting in thermal expansion of ocean water, and melting of land-based glaciers and ice caps. Sea level around the UK is projected to rise by 12 to 76 centimetres (cm) by the year 2095 (depending on which emission scenario is used). Taking account of the vertical movement of land, this gives slightly larger sea level rise projections in the southern UK where land is subsiding, compared to the north.

Changes in the winter mean wave height are projected to be between –35 cm and +5 cm and changes in the annual maxima are projected to be between –1.5 metre (m) and +1 m. There is no significant evidence for future changes in storm-related extreme sea levels for the UK, due to low confidence in the simulation of extreme winds in climate models. Therefore for the most part, future changes in extreme sea level will be governed by mean sea level rise, rather than any change in the storm surge component[28].

The Climate Change Act 2008 creates a framework for the UK to adapt to climate change through producing a UK Climate Change Risk Assessment (CCRA) every five years, which includes a marine and fisheries sector report. The first CCRA was published in January 2012[29] and a National Adaptation Programme (NAP) was published on 1st July 2013, responding to the risks within the CCRA. The Climate Change Act also gives government power to request that certain organisations and, some public bodies report on the steps that they are taking to respond to climate change.

An analysis of local authority core strategies, local development frameworks and AONB plans in the South Marine Plan area, highlights the challenges of climate change through policies which cover broad mitigation and adaptation strategies, and

[24] MCCIP (2010) Marine Climate Change Impacts Partnership Climate of the marine environment [Online] Available from: www.mccip.org.uk/annual-report-card/2010-2011/climate-of-the-marine-environment.aspx.
[25] Pinnegar, J., et al., 2012 Climate Change Risk Assessment for the Marine and Fisheries Sector In: UK 2012 Climate Change Risk Assessment. Defra, London.
[26] Defra, 2012, UK Climate Change Risk Assessment
[27] Jenkins et al, 2009. UK Climate Projections: Briefing report.
[28] MCCIP (2010) Marine Climate Change Impacts Partnership Climate of the marine environment [Online] Available from: www.mccip.org.uk/annual-report-card/2010-2011/climate-of-the-marine-environment.aspx
[29] Pinnegar,et al (2012) UK Climate Change Risk Assessment for the Marine and Fisheries Sector.

specific requirements relating to potential impacts such as sea level rise, coastal flooding and increased erosion. Policies include:

- The need for developments to have sustainable design and construction, be energy efficient, reduce contribution to carbon emissions, and be designed and located to be resilient to the impacts of climate change[30]
- The importance of green infrastructure and natural areas in reducing impacts of climate change
- The need to enable wildlife and habitats to adapt to climate change and to seek opportunities to mitigate for the impact of sea level rise on the landscape, access and nature conservation interests and for habitat creation[31]
- The need for developments to demonstrate resistance and adaptation to the projected long term effects of climate change, including extreme weather events, flood damage, greater variability in temperature, and sea level rise over the life of the development[32]
- Recommendations that development will not be permitted in the vicinity of areas liable to flood[33]
- Where a risk of flood is identified then planning applications must be accompanied by a site-specific flood risk assessment identifying how risk will be mitigated and minimised. This must be consistent with the latest guidance in the Strategic Flood Risk Assessment, national planning policy framework and technical guidance, and any supplementary information from the Environment Agency[34].

A number of local authority plans have more spatially specific policies. The Poole Core Strategy prioritises the protection of the town centre from the risk of coastal flooding associated with global warming and predicted sea level rises by 2126, through the development of new flood defences. It also flags the importance of considering impacts upon the natural environment, for instance through facilitating species migration and habitat creep.

The New Forest District Council core strategy states that development will not be permitted within the defined coastal erosion zone which runs along the cliff tops from the district boundary west of Barton-on-Sea to Milford-on-Sea, so as to reduce future threats to public safety. Policies in the West Dorset and East Devon Local Plans reflect the significance of coastal change.

Potential key issues

The marine area is intrinsically linked to UK society and the wider economy; as such, potential impacts of climate change on the marine sector will have wider consequences. Particularly clear links are identified with biodiversity, ecosystem

[30] Arun District Council draft local plan, Worthing LDF, South Hampshire LDF, New Forest National Park LDF, Exeter Core Strategy.
[31] Wealdon LDF; New forest national park LDF; management plans for the Isle Of Wight AONB, Chichester harbour AONB, South Devon AONB.
[32] Southampton LDF, Chichester harbour AONB Management Plan, The plan for Torbay to 2032 and beyond.
[33] Bournemouth district wide local plan,
[34] Brighton and Hove City Council LDF draft core strategy; Havant LDF

services, health, transport and business, industry and services sectors[35]. Some of the potential issues for the South marine plan areas are highlighted in table 2.

[35] Pinnegar, et al (2012) UK Climate Change Risk Assessment for the Marine and Fisheries Sector.

Table 2. Climate variable and related impact on the marine environment and selected human activities in the South marine plan areas. Information extracted from MCCIP report cards (2009-2010) and (2012-2013) (www.mccip.org.uk/)

Climate variables	Aggregate Extraction	Fishing (and shell fisheries)	Ports and Shipping	Marine Protected Areas	Tourism and Recreation	Coastal Protected	Renewable Energy	Comments/background information
Increased seawater temperature		x	x	x	x	x		• Changes in plankton, fish communities and food chains. These affect survival of fish eggs and larvae or plankton. Direct impact on reproductive physiology and growth of fish. Subsequent impact on breeding seabirds and marine mammals, impact to tourism, offshore and coastal protected area conservation targets, and to tourism including recreational fisheries. • Changes in the behaviour, distribution or migration of species, impact on fisheries and the effectiveness of designated sites. • Invasion of new (or introduced) species and Harmful Algal Blooms, loss of natives – impact on fisheries and shellfisheries and conservation status of Marine Protected Areas, and on human health through bathing water quality. • Impact on recreational fisheries through distribution shifts and changed river flows. • Destabilisation of methane hydrate deposits (danger of out-gassing, impact on ecosystems and shipping).

								• Improved conditions for coastal tourists in the UK. • Improved conditions for emersion recreational activities (surfing, diving etc).
Earlier stratification		x		x	x	x		• Changes in plankton communities and fish distribution, impact on fish recruitment and fisheries. Also impact on breeding seabirds and marine mammals, offshore and coastal protected area conservation targets, and to tourism.
Ocean acidification		x		x				• Reproductive physiology and growth of shellfish affect yields of commercial shellfisheries. Also a food-web impact on fisheries and conservation status of Marine Protected Areas. • Increased sound transmission in the ocean - impact on fisheries catch ability and biodiversity.
Changed ocean currents		x						• Dispersal/survival of fish eggs and larvae or plankton – impact on fish recruitment & fisheries.
Changes in storm frequency, wave height & wind strength	x	x	x	x	x	x	x	• Reduced access to offshore aggregate resources. Increased need for marine aggregates for sea defences. • Changes in sedimentation of navigation channels (need for dredging, re-mapping, safety concerns). • Increased insurance costs for vessels. • Variable weather conditions for fishing therefore more days in port or changes in fishing grounds. • Disruption to ports, harbours, ferries and shipping. • Loss of cargo. More frequent accidents. • Loss or inundation of natural habitats – impact on conservation status. Impact on breeding success of seabirds, therefore impact on conservation status and tourism. Impact on biodiversity (e.g. beach nesting birds). • Increased risk/losses to tourism infrastructure including beach loss. • Changes in opportunities for sailing or surfing. • Reduced access to offshore wind turbines.

								• Increased scour around legs and supports of wind turbines – costs of remediation and replacement. Increased scour around buried cables - costs of remediation and replacement. Difficulty laying offshore cables. • Improved opportunities for wave energy. • Changes and possible improvements on the efficiency of offshore wind turbines.
More frequent flash flooding and run-off		x	x		x			• Increase in HABs affecting shellfish and human health and tourism. • Changes in sedimentation of navigation channels (need for dredging, re-mapping, safety concerns). • Increased risk to coastal tourism industry – travel to coasts and uncomfortable weather conditions.
Melting Arctic ice	x	x	x	x	x			• Establishment of non-natives from new shipping routes affecting fishing industry. • More unpredictable ice conditions and fog, impact on risk of accidents and spillage from ships. • Potentially reduced distances and fuel costs associated with shipping through the Arctic.
Sea level rise	x	x	x	x	x	x		• Increased rate of coastal erosion. This could lead to deeper water in near shore areas, which would in turn cause an increase in wave energy reaching the coast. Impacts of coastal erosion on buildings and infrastructure located along the coast are therefore likely to increase[36]. • Coastal evolution will result? due to combined effects of flooding, squeeze and erosion at the coast. • Increased need for marine aggregates for sea defences. • Impact on biodiversity if coastal habitats inundated (e.g. beach nesting birds). • Increased risk/losses to tourism infrastructure; including beach loss.

[36] Ramsbottom, et al (2012) UK Climate Change Risk Assessment for the Flood and Coastal Erosion sector.

Changes in air temperature and calmer weather	x	x	x	x	x			• Improved conditions for coastal tourists in the UK. Benefits for immersion water sports (e.g. scuba diving).

The UK is committed to reducing greenhouse gas (GHG) emissions by 80% by 2050 compared to 1990 levels. This is already resulting in, and will continue to result in, an expansion of renewables and of nuclear energy (although the latter will not be within the South Marine Plan Areas). In the medium term, continued use of oil and gas will require CCS to reduce GHG emissions, however, this is more likely to be in the North Sea and Irish Sea, rather than in the South Marine Plan Areas[37].

2.2 Natural environment

2.2.1 Air quality

Air pollution can impact upon biodiversity, the wider environment and the health of people. The cost of man-made particulate air pollution on human health has been estimated to cost between £8.6 billion and £18.6 billion a year[38] although legislation and policy governing air quality, introduced over the last 30 years, has successfully minimised the worst health effects.

The MPS recognises that activities and developments in the marine and coastal area can have adverse effects on air quality[39]. The principal sources of air contamination at sea are from point source oil and gas installations and ship movements[40] and the generation of energy from renewable sources has an overall beneficial effect on air quality, in comparison to fossil fuels[41]. Sulphur Dioxide (SO_2) and Nitrogen Oxides (NOx) are two of the main sources of pollutants from ships both of which are regulated by MARPOL (International Convention for the Prevention of Pollution from Ships) through the restriction of these emissions from ship exhausts as well as the deliberate emission of ozone depleting substances.

Current Situation

The Air Quality Strategy sets national objectives for local authorities. Many of the standards are derived from EU obligations, such as from the Ambient Air Quality Directive (and daughter directives) and the National Emission Ceilings Directive.

Local authorities have been carrying out assessments since 1997 to measure air quality in their area and try to predict how it will change in the future. All local authorities have to report the outcomes of their assessments against national objectives and if any area does not meet the requirements, an Air Quality Management Area (AQMA) is declared and an action plan is developed to address the issues[42]. Although these AQMAs are terrestrial focused, many of the local authorities with AQMAs are coastal and therefore port or shipping activity is likely to contribute to the air quality alongside related and surrounding activities such as freight transport. This is because industry is often situated close to ports because of the proximity to import (for raw materials) and export (finished goods) routes. For example, some of the highest concentrations of SO_2 are located at some of the UK's

[37] MMO (2013). South marine plan areas futures analysis. A report produced for the Marine Management Organisation by ABP Marine Environmental Research Ltd, 241pp. MMO Project No: 1039. ISBN: 978-1-909452-14-5.
[38] Defra (2010) Valuing the Overall Impacts of Air Pollution
[39] Marine Policy Statement (2011). Defra. 2.6.2.1
[40] http://apis.ac.uk/overview/regulations/overview_shipping_emissions.htm
[41] Marine Policy Statement (2011). Defra. 2.6.2.1
[42] http://aqma.defra.gov.uk/aqma/home.html

major ports such as Southampton. However, other ports such as Dover do not show 'hotspots' of SO_2 concentrations indicating it is not necessarily shipping itself that accounts for the peaks but the nearby industry linked to the ports[43].

There are 18 local authorities adjacent to the South Inshore plan area with at least one Air Quality Action Plan in each[44]. Many of the local authorities refer to air quality and associated action plans in their core strategies, mostly in relation to only supporting development that will not cause (air) pollution unless it does not breach the national objectives.

Sulphur emissions from ships are also controlled under the International Convention for the Prevention of Pollution from Ships (MARPOL). The International Maritime Organisation (IMO) has set up a Sulphur Emission Control Area where sulphur emission standards are more restrictive than other areas and this includes the South Inshore and South Offshore marine plan areas. This has implications for shipping because it requires a more expensive, but less polluting, type of fuel to be used and this must be in place by 2020[45].

Future trends

Air quality is not routinely monitored at offshore sites so it is difficult to predict the future trend of air quality in the South marine plan areas. Historically, since the 1960s when monitoring of air quality began, air pollution from NOx, Sulphur Oxides and particulate matter has reduced overtime[46].

The MSFD UK Initial Assessment and Good Environmental Status recognises the link between a healthy marine environment, specifically sub-tidal benthic habitats, inter-tidal rocky habitats and inter-tidal sediment habitats, and the regulation of air quality. Any degradation in these habitats could reduce their ability to regulate air quality[47].

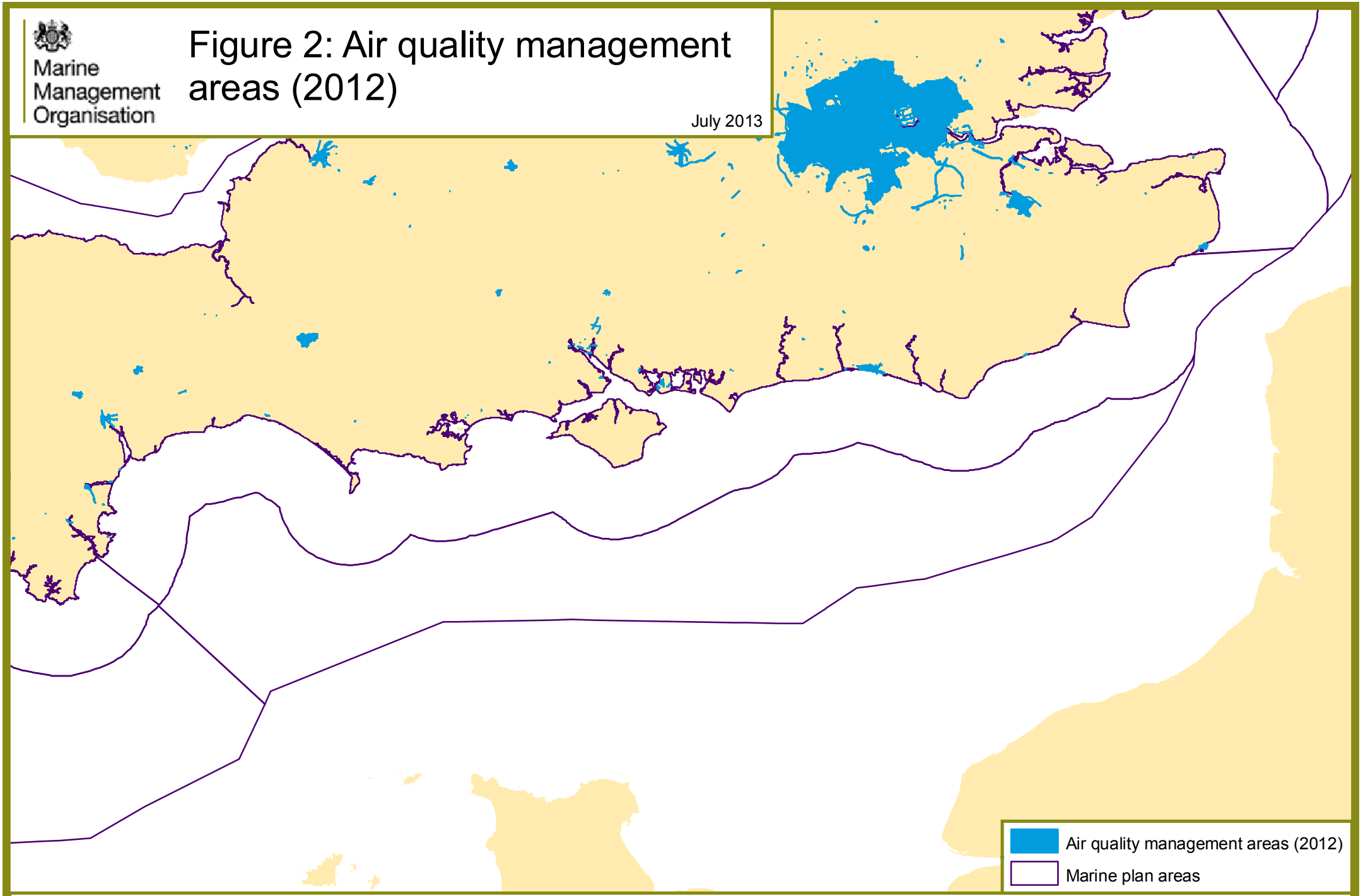
Shipping is becoming increasingly subject to international standards as discussed in the sections above and these measures are expected to have a significant benefit on air quality and human health[48]. However, the use of specialised fuel comes at an increasing cost to shipping companies and could result in reduced ship traffic with companies opting to move freight via other means.

[43] Air Pollution in the UK annual report (2011). Defra.
[44] http://aqma.defra.gov.uk/aqma/maps.php
[45] Strategic Scoping Report (2013). MMO.
[46] Air Quality in the UK (2003). Defra.
[47] Marine Strategy Part one: Initial Assessment and Good Environmental Status (2012). HM Government.
[48] International Maritime Organisation Maritime Knowledge Centre, 2012. International Shipping Facts and Figures – Information Resources on Trade, Safety, Security, Environment. 7.5. Ship-generated air pollution

Marine Management Organisation

Figure 2: Air quality management areas (2012)

July 2013



Potential key issues

Marine plans provide the opportunity for greater integration at the coast to reduce air pollution. Terrestrial air pollution is already managed through AQMAs and emissions from shipping are governed by international legislation through the IMO. Otherwise air quality at sea is not measured nor managed in a holistic manner.

1. The impact of air pollution on the environment and human health is partly dependent on marine industry. The potential future trends of industries which emit SOx, NOx and particulate matter have a direct impact on air quality. Therefore it is important to look to the future direction of these industries to understand the potential future impact on air quality.
2. As previously noted, legislation and policy at an international and national level have done a significant amount to reduce the impact of air pollution on human health, although there is still opportunity for continued improvements.

Interactions with other sectors

1. Ports and shipping: increased shipping activity, port expansion and associated industry growth could lead to increased SOx and NOx emissions at coastal locations, which in turn could contribute to the breach of national objectives for air quality. The legislation outlined in earlier text goes a significant way to addressing these emissions but if trade increases, leading to more shipping movements, this could counteract the influence of international and national legislation.
2. Shipping is becoming increasingly subject to international standards as discussed in the sections above and these measures are expected to have a significant benefit on air quality and human health. However, the use of specialised comes at an increasing cost to shipping companies and could result in reduced ship traffic with companies opting to move freight via other means. This too could have a benefit on air quality but also impact on local economies reliant on ports, shipping and associated industries.

Issues for sustainability

1. The requirements of national and international legislation (e.g. the use of specialised fuel, with no more than 0.1% sulphur content by 2015) to address air pollution could lead to increased sea transport costs and thus a possible reduction in the competitiveness of short-sea shipping versus other transport modes (rail, road, air). This would benefit air quality but have a knock on effect on the national economy as well as coastal communities reliant on the port industry for local income and employment.
2. In the South marine plan areas, there is a significant amount of commercial shipping, recreational boating and passenger ferries which collectively will contribute to air pollution. Consideration of the cumulative effect of these activities on air quality will need to be considered, particularly in the coastal area.
3. Ongoing challenges with air quality in AQMAs at the coast and on land could lead to eutrophication of the marine environment through acid deposits from SOx emissions.

2.2.2 Sediment and water quality

The MPS states: “Developments and other activities at the coast and at sea can have adverse effects on transitional, coastal and marine waters. During the construction, operation and decommissioning phases of development, there can be increased demand for water, discharges to water and adverse ecological effects resulting from physical modification to the water environment.” Furthermore, the MPS recognises that as part of sustainable development, the health and wellbeing of communities and the protection of the environment is paramount and this can be achieved through providing modern, high quality management and treatment of surface and waste water[49]. This also contributes to our compliance with EU legislative requirements.

Sedimentary processes of the seabed play a critical role in the distribution of benthic habitats, which in turn, form a major part of ocean life[50]. Sediment movement on the seabed occurs in two ways: suspended sediment transport of mud and fine sand and bedload transport of sand and gravel. Both of these are predominantly controlled by offshore tidal currents, as opposed to wave climate[51]. Sedimentary processes are not only influenced by natural processes. Dredging, particularly in inshore areas, can be a benefit to sedimentary systems as well as delivering social and economic benefits through the use of dredged materials in construction, recreational activities (beach nourishment) and habitat creation (salt march restoration)[52]. It must be noted that where sediment is contaminated, possibly through historical industrial activity, dredging has the potential to cause significant environmental and health effects through the exposure of contaminants.

Current situation

Increasingly strict legislation and considerable investment from water companies has significantly improved water quality in the UK. This has resulted in a steady increase in bathing water quality since 1988 in the South marine plan areas. Similarly there has been a general increase in the number of monitored shellfish waters in England and Wales and much of this is due to sewerage improvement schemes. It is important to note that for both directives, there have been variations in the year on year increases which are often due to weather patterns, especially heavy rainfall which leads to increased incidences of storm overflows and diffuses agricultural pollution.

There are a large number of waste water discharge points across the South marine plan areas which are mostly managed by Southern Water, South West Water and Wessex Water. There are also trade and industry discharge points in various locations, e.g. Poole Harbour, Southampton Water, Portsmouth and Chichester Harbours and Dover. There are three power stations (Dungeness nuclear power station, Shoreham power station and Fawley power station) which abstract water for cooling purposes and then return the water to the marine environment as waste water[53].

[49] Marine Policy Statement (2011). Defra. 3.10.1.
[50] Charting Progress 2, Ocean Processes (2010). Defra.
[51] Brampton A H, Evans C D R and Velegrakis A F (1998) Seabed Sediment Mobility Study - West of the Isle of Wight. Project Report No 65. London: CIRIA 218 pp
[52] Marine Policy Statement (2011). Defra, 3.6.4.
[53] MMO (2013). South Marine Plan Areas Futures Analysis. MMO Project No: 1039

There are high concentrations of water treatment works and sewerage disposal points around the main conurbations including Exeter, Weymouth, Poole, Southampton, East Isle of Wight, Portsmouth, Chichester, Brighton and Hove, Hastings and Folkestone. These and all the other surface water and waste water collection systems along the south coast are linked up to waste water treatment plants to ensure the water is treated before being discharged back to the marine area[54].

Under the Urban Waste Water Directive there are requirements for sewage treatment, this includes specific provisions for sensitive areas. Sensitive areas are waters which are eutrophic, or at risk of becoming eutrophic, contain nitrate concentrations >50mg/l, or may fail to meet standards required in other directives. Sewage discharges entering these waters are required to have a greater degree of treatment. In the South marine plan areas, there are:

- eight coastal waters which are considered sensitive, they are located in the east Solent including Chichester, Langstone and Portsmouth harbours as well as Poole harbour
- 36 are considered sensitive under the Bathing Waters Directive and they are located around Dungeness, the east Solent, Poole bay and Lyme Bay
- 16 are considered sensitive under the Shellfish Waters Directive and these are located within the east Solent, Poole Bay, the Exe estuary and the River Dart[55].

There are two River Basin Management Plans (RBMPs) covering the South marine plan areas; the South East RBMP and the South West RBMP. Within these two RBMPs, there are 18 coastal water bodies which fall within the South marine plan areas, three have good ecological potential (located between Portland Bill and Selsey Bill and south of the Isle of Wight) and 15 have moderate ecological status or potential. In terms of chemical status, nine sites currently have good status, one site failed the standard and eight do not require assessment.

RBMPs also address estuarine and transitional waters of which there are 27 in the South marine plan areas. Of these, 25 have been assessed as moderate, one has failed ecological quality (located within Poole Harbour) and one has been assessed as good ecological quality (located in Christchurch Harbour).

In the South marine plan areas, sandy gravel and gravel is the predominant form of sediment with some large deposits of gravelly sand. Capital and maintenance dredging of sediments is focused around the Isle of Wight and in Southampton Water and this is to support shipping activity.

The Bathing Waters Directive (2006) sets out standards for testing certain types of bacteria in the marine area during bathing season (May-September). Approximately 130 sites were surveyed in the South marine plan areas in 2012 of which six failed to reach the required standard (all located in the western half of the South marine plan

[54] MMO (2013). South Marine Plan Areas Futures Analysis. MMO Project No: 1039
[55] ibid

areas). It is believed the stricter standards under the Directive coupled with the heavy rainfall in summer 2012 contributed to the failures[56].

There are 28 designated shellfish waters in the South marine plan areas and these are mostly found around the Solent, Poole Harbour and Portland Harbour.

The analysis of local authority core strategies indicated the importance of good water quality through policies covering:

- Maintaining the highest standard of water quality for the purposes of tourism and recreation and for the benefit of environmental designations
- Management of litter in the estuary and coastal areas
- Proposals not having an adverse effect on the quality of coastal waters i.e. reducing pollution
- Support for meeting Water Framework Directive Standards and working at a catchment scale to integrate marine conservation, land use and water quality.
- There is specific mention of the Poole Harbour designated sites in relation to reducing the adverse effect of nutrient loading in this area.

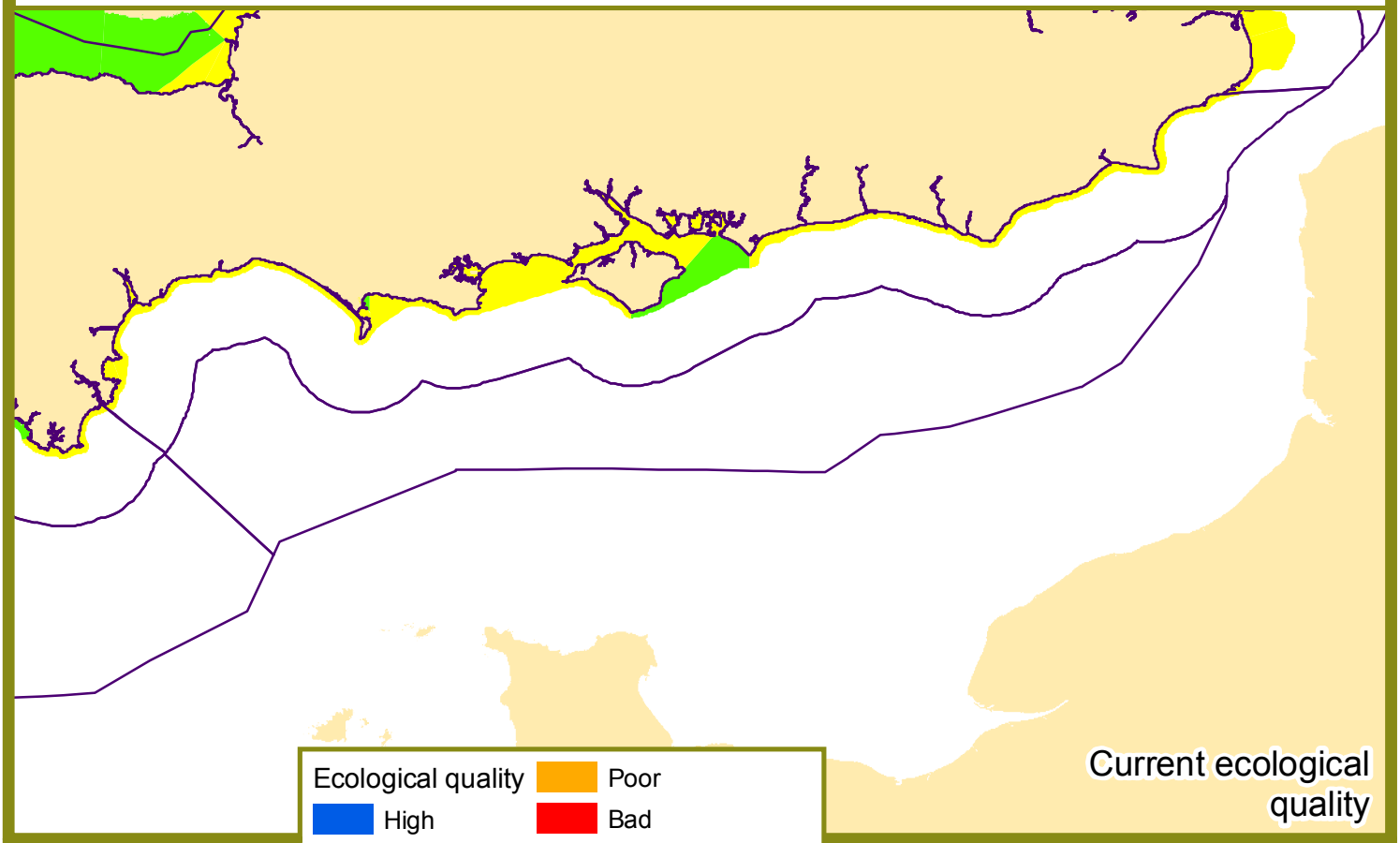
Waste water discharges do not generate a measurable economic value but are an often unavoidable product of many industries. Furthermore, sectors such as tourism, recreation and shellfisheries rely on a healthy marine environment, which includes good water quality (ecological and chemical), for the future of the industry. Therefore the provision, and treatment of, waste water is crucial to the development and growth of many marine activities and industries, as contamination of shellfish and bathing waters can have a social and economic impact as well as supporting a healthy marine environment.

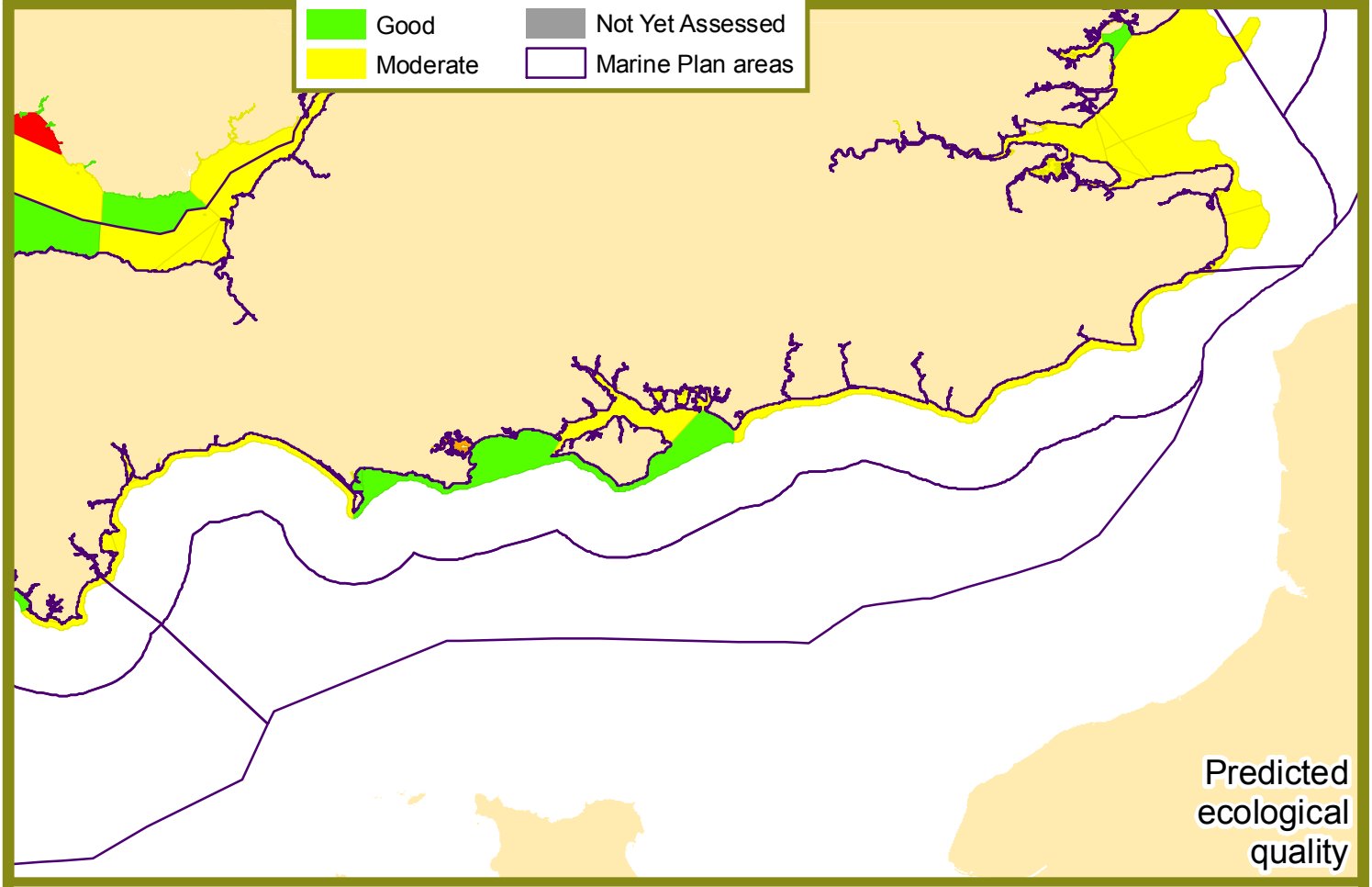
[56] MMO (2013). South Marine Plan Areas Futures Analysis. MMO Project No: 1039

Marine Management Organisation

Figure 3: Current and predicted ecological water quality

September 2013





Future trends

There are a number of key policy drivers for surface and waste water management and these are: Water Framework Directive (incorporating River Basin Management Plans), Shellfisheries Directive, Bathing Waters Directive and the Urban Waste Water and Treatment Directive. There are also a number of programmes and plans which either highlight areas for improvement i.e. by water companies or set out how the requirements of various directives should be met.

The MSFD recognises eutrophication as one of the major threats to the quality of estuarine and coastal waters. Inputs of nitrogen and phosphorous and from sewage effluents and industrial processes are the main causes of anthropogenic eutrophication and so the MSFD is a key policy driver to reduce eutrophication in UK seas and thus improve the overall quality of marine waters and health of the marine area in the future[57].

Potential key issues

- Population growth and associated infrastructure, will put more demand on the sewage network and water companies with regards the disposal of waste water. It may also contribute to urban creep which has the potential to alter the dynamics of a catchment.
- More frequent and intense storms, possibly as a result of climate change, could impact on the water quality due to the potential for storm overflows.

Interactions with other sectors

- Tourism, recreation, fisheries and shellfisheries all rely on, and are influenced by, a healthy marine environment, which includes good water quality. Without this, these activities and industries could be impacted economically and socially.
- The development of industry such as nuclear power or port expansion will impact on coastal waters during their construction, operation or decommissioning phases. While this is an often unavoidable by-product of industrial development, the cumulative impact on the water environment must be considered and monitored.
- Climate change could lead to increased flooding and coastal erosion, which in turn could lead to increased sediment loading in estuaries and coastal areas. This could impact upon port and shipping activity as further dredging of sediment may be required (which has an economical impact) to enable them to continue their activities

Issues for sustainability

- The location of outfalls and discharge points must be considered in relation to the impact on the natural environment. There are a significant number of environmental designations in the South marine plan areas which could be negatively impacted by discharges and outfalls. Furthermore, the physical appearance of outfalls should be considered in relation to the impact on seascape (although the latter would be considered at application level).

[57] Marine Strategy Framework Directive http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:32008L0056:EN:NOT

2.2.3 Underwater noise

Ambient and impulsive sound can be generated by marine activities including:

- offshore construction,
- sand and gravel extraction,
- drilling,
- ship movements,
- use of sonar, underwater explosions,
- seismic surveys,
- acoustic deterrent devices (ADDs).

The energy in these sounds generally exceeds the levels that occur naturally in the marine environment such as sounds created by rain, wind and waves[58].

Increased levels of underwater noise can affect many marine organisms in a number of ways. Ambient or continuous sound can disrupt their ability to navigate over long distances as well as affecting local orientation (which is required to avoid predators and hazards) and search for prey and mates. Impulse sounds cause effects such as avoidance of feeding or breeding grounds, temporary or permanent damage to hearing and, in extreme cases, death[59].

Marine mammals are the best known group considered to be at risk from increased underwater noise but many fish species and some invertebrates can potentially be affected[60,61].

Current situation

Implementation of the Marine Strategy Framework Directive (MSFD) Descriptor 11 is the main mechanism through which underwater noise is considered at a strategic level. The initial assessment to help define this descriptor, concludes that there is insufficient data to support a quantitative assessment of underwater noise in UK waters, due to lack of monitoring studies. To understand the effects of noise on both individuals and groups of different species as well as the risks, significance and appropriate mitigation of impacts, further investigation and research is required. It should be noted however that at this time there is no evidence to suggest that current levels of noise in UK waters is are having an impact on the population levels of cetaceans or other noise sensitive marine animals[62].

[58] OSPAR (2009), Assessment of the environmental impact of underwater noise, Available online: http://qsr2010.ospar.org/media/assessments/p00436_JAMP_Assessment_Noise.pdf#page=13

[59] HM Government (2012), Marine Strategy Part One: UK Initial Assessment and Good Environmental Status, Available online: www.gov.uk/government/uploads/system/uploads/attachment_data/file/69632/pb13860-marine-strategy-part1-20121220.pdf

[60] DECC (2009), UK Offshore Energy Strategic Environmental Assessment (OESEA): Environmental Report, Available online: www.offshore-sea.org.uk/consultations/Offshore_Energy_SEA/OES_A3d_Water.pdf

[61] DEFRA (2005), Charting Progress 2, Available online: http://chartingprogress.defra.gov.uk/clean-seas-noise

[62] HM Government (2012), Marine Strategy Part One: UK Initial Assessment and Good Environmental Status, Available online: www.gov.uk/government/uploads/system/uploads/attachment_data/file/69632/pb13860-marine-strategy-part1-20121220.pdf

The MSFD Descriptor 11 assessment also highlights that compliance with existing legislative requirements such as the Environmental Impact Assessment Directive, the Strategic Environmental Assessment Directive and the Habitats Directive is sufficient to ensure that the direct impacts of noise on the marine environment are appropriately managed.

Defra has also been working closely with Cefas, JNCC, DECC and the Crown Estate to look at the potential for cumulative impacts occurring from construction noise across the marine space. This work has indicated that current and projected levels of impulsive sounds are unlikely to result in significant cumulative impacts, which could result in significant behavioural effects of marine life.

In addition to this group there is a wider Underwater Sound Forum[63] which is made up of key stakeholders in the marine and maritime communities that have an interest in how noise is measured. Areas of work include:

- Production of guidelines for the measurement of ambient noise
- The characterisation of piling noise and guidelines for its measurement
- The characterisation of marine aggregate extraction noise and guidelines for its measurement
- Shipping Noise
- Work on Descriptor 11

Future trends

In response these findings the recommendation of Descriptor 11, a noise registry is to be created which will record, assess and manage the distribution and timing of anthropogenic sound sources over a certain frequency, in the marine environment. In addition to this, surveillance and monitoring of ambient noise levels will also be completed[64].

The development of offshore renewables and other marine construction in the near future will potentially cause impulse noise to be generated across the marine environment. The impact and severity of each activity will be considered in project specific applications such as EIA's. The Energy National Policy statement EN-3 gives guidance on how developers and decision makers should consider these impacts of underwater noise and appropriate mitigation measures that can be employed[65].

[63] MEDIN, Website (Accessed 25/07/2013), underwater sound forum, Available online: www.oceannet.org/underwater_sound_forum/

[64] HM Government, 2012, Marine Strategy Part One: UK Initial Assessment and Good Environmental Status, Available online: www.gov.uk/government/uploads/system/uploads/attachment_data/file/69632/pb13860-marine-strategy-part1-20121220.pdf

[65] https://whitehall-admin.production.alphagov.co.uk/government/uploads/system/uploads/attachment_data/file/37048/1940-nps-renewable-energy-en3.pdf[65] DECC (2011), National Policy Statement for Renewable Energy Infrastructure (EN-3), Available online: https://whitehall-admin.production.alphagov.co.uk/government/uploads/system/uploads/attachment_data/file/37048/1940-nps-renewable-energy-en3.pdf

The operation of offshore energy production installations, initially wind farms then tidal and wave systems in the South marine plan areas, is likely to raise local ambient and impulse noise levels both in the short and long term. The management of subsurface noise emitted from shipping is currently the subject of international debate within the International Maritime Organisation and further guidance is expected on this issue in the future[66].

Potential key issues

- Mainly renewables and other marine construction which have the potential to cause more overall noise at damaging frequencies and over a larger geographical area.
- Due to the impact of shipping noise on receptors not being fully understood, there is a potential for injury and other effects that may not be observed67. This may increase in the future as the amount of shipping traffic increases.
- Need for further evidence on impacts at all levels.

2.2.4 Marine ecology

The UK Government is committed to halting the loss of biodiversity and restoring it so far as is feasible. This means:

- A halting and, if possible, reversal of biodiversity loss with species and habitats operating as part of a healthy, functioning ecosystem; and
- The general acceptance of biodiversity's role in enhancing the quality of life, with its conservation becoming a natural consideration in all relevant public, private and non-governmental decisions and policies[68].

This is reflected in the Marine Strategy Framework Directive (MSFD)[69], NERC Act, National Ecosystem Assessment (NEA)[70], and through a wider commitment to the EU Biodiversity Strategy[71] which highlights the need to 'protect, value and appropriately restore, biodiversity for its intrinsic value and essential contribution to human wellbeing and economic prosperity. The Natural Environment White Paper[72] (NEWP) calls for key reforms for protecting and improving the natural environment including supporting Local Nature Partnerships, creating new Nature Improvement Areas, the need for ecologically coherent planning and piloting biodiversity offsets.

[66] DEFRA (2005), Charting Progress 2, Available online: http://chartingprogress.defra.gov.uk/clean-seas-noise

[67] HM Government, 2012, Marine Strategy Part One: UK Initial Assessment and Good Environmental Status, Available online: www.gov.uk/government/uploads/system/uploads/attachment_data/file/69632/pb13860-marine-strategy-part1-20121220.pdf

[68] HM Government (2011) Marine Policy Statement, paragraph 2.6.1.1.

[69] Directive 2008/56/EC. Accessible at: http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:32008L0056:EN:NOT

[70] UK National Ecosystem Assessment (2011). UNEP-WCMC, Cambridge

[71] http://ec.europa.eu/environment/nature/biodiversity/comm2006/2020.htm

[72] Defra (2011) The Natural Choice: securing the value of nature. Accessed at: www.official-documents.gov.uk/document/cm80/8082/8082.pdf

The MSFD initial assessment[73] of the state of the marine environment and the pressures and impacts it faces builds on the state of the marine environment assessment Charting Progress 2 (CP2) and associated feeder reports[74] published in July 2010[75]. Under the MSFD, a framework is being established within which EU Member States will take measures to achieve Good Environmental Status (GES) for the marine environment by 2020. The characteristics of GES[76] provide a description of what the marine environment will look like when GES is achieved, with targets and indicators developed for each descriptor to provide a framework assessing progress[77]. There are 11 Descriptors[78] for GES; Descriptor 1 (biodiversity), Descriptor 4 (food webs) and Descriptor 6 (sea-floor integrity) are particularly relevant to the health of the marine environment, protection of biodiversity, sustainability and productivity of marine ecosystems and the goods and services they provide.

Existing measures such as the Water Framework Directive, Habitats Directive, Wild Birds Directives, MPA network, and the Common Fisheries Policy are already contributing to improving the state of the marine environment. The Government will review before 2015 whether any additional measures might be required to achieve GES.

Local plans across the South Inshore plan area reflect national policy, calling for biodiversity to be safeguarded, with policies which protect, manage and enhance the environmental and ecological characteristics of the local area in both designated and non-designated sites. These include policies by Arun, Bournemouth, Eastbourne and the Isle of Wight to name a few. The importance of links between habitats is recognised to connect isolated sites and to facilitate species movement. Although the UK Biodiversity Action Plan (UK BAP) has been succeeded by the UK Post-2010 Biodiversity Framework[79], the list of priority habitats and species remains a useful reference for local authority decision-makers. Details of each habitat and species with current issues and threats can be accessed via the JNCC website[80].

A number of local development frameworks (LDFs) have highlighted the link between a healthy level of biodiversity and the additional benefits to the tourism and recreation sector, including Exeter, the New East Devon local action plan and

[73] HM Government, 2012, Marine Strategy Part One: UK Initial Assessment and Good Environmental Status

[74] Charting Progress 2 documentation including feeder reports can be found at: http://chartingprogress.defra.gov.uk/

[75] It should be noted that while CP2 is also used to inform this report, its assessments are based on regional sea units, which do not exactly align with English marine plan areas, the South marine plan areas correspond to the CP2 Eastern regional sea (Region 3) which extends slightly further east towards the Thames Estuary.

[76] MSFD, 2008/56/EC Article 3(5) – Good Environmental Status means the environmental status of marine waters where these provide ecologically diverse and dynamic oceans and seas which are clean, healthy and productive within their intrinsic conditions, and the use of the marine environment is at a level that is sustainable, thus safeguarding the potential for uses and activities by current and future generations. A fuller description is set out at MSFD, 2008/56/EC Article 3(5).

[77] HM Government, 2012, Marine Strategy Part One: UK Initial Assessment and Good Environmental Status

[78] MSFD 2008/56/EC Annex 1.

[79] http://jncc.defra.gov.uk/pdf/UK_Post2010_Bio-Fwork.pdf

[80] http://jncc.defra.gov.uk/page-5705

Eastbourne core strategy. Wealden LDF notes the additional benefit to healthy living as recreational opportunities are enhanced. Policies that relate specifically to the marine environment include the South Downs national park which supports the value of marine and coastal habitats and Worthing LDF which promotes new development on the seafront which will limit adverse effects on the marine environment.

There are a number of cross-channel initiatives relevant to the South marine plan areas, such as the PANACHE project (Protected Area Network Across the Channel Ecosystem), CAMIS (Channel Arc Manche Integrated Strategy), VALMER (Valuing Marine Ecosystem Services in the Western Channel Region)[81] and CHARM (Channel Integrated Approach for Marine Resource Management). These projects aim to develop common assessment and management methods across the MPA network, improve marine ecosystem service valuation to support management and planning, and seek to develop and implement integrated maritime policy, and sustainable management. In addition, there are a number of regional coastal partnerships such as the Solent Forum and Dorset C-Scope, established to deliver integrated coastal zone management.

The natural environment within the South marine plan areas encompasses marine and coastal biodiversity, water, air and geology. The quality of the marine natural environment has a direct effect on the way we benefit from it; as a source of food, energy and building materials, and as a place where we live, work and play. The natural features, species and habitats in the South marine plan areas are particularly diverse in nature, with some aspects being nationally and international important and rare.

The underlying geology ranges from massive sub-tidal sandbanks to areas of mixed sediment sand and rocky reef, ranging from hard granite to soft chalk and clays, the diversity of habitat helps drive the diversity of species. In addition to the Jurassic Coast World Heritage Site, it is home to significant stretches of global rare coastal chalk outcrops near Dover, Eastbourne, the Isle of Wight and Dorset.

The many estuaries, large and small, in the South Plan inshore area significantly increase the length of the coastline and the opportunities for land-sea interactions, as well as introducing their own unique features to the overall nature of the plan areas.

This section goes on to look at features within the overarching biodiversity that have special protection measures or are seen as a key indicator in ecosystem[82] health and climate change, such as plankton. Habitats, fish, cetaceans, seals and birds are all listed in Annex III of the MSFD[83] which sets out an indicative list of natural environment characteristics that can be used to assess GES.
The MPS requires that the marine plan authority should ensure that 'appropriate weight' is attached to, among other things, protected species, habitats and other species of "principal importance for the conservation of biodiversity", such as those

[81] VALMER is an 11 partner Interreg IV A Channel programme, to which the MMO provides funding.
[82] An ecosystem formed by the interactions between a community of living organisms in a particular area and its nonliving environment.
[83] EC Marine Strategy Framework Directive (MSFD) 2008/56/EC – p.36 ANNEX III table 1 Indicative lists of characteristics, pressures and impacts - Table 1 Characteristics

identified through the Convention on Biological Diversity and, OSPAR. While there is currently no map available in this document, we hope to provide one for the workshops relating to this report.

Microbes and plankton

Marine microbial and planktonic organisms play a key role in cycling nutrients that are essential for other marine organisms. As plankton is at the bottom of the food web it supports and therefore affects many other species, such as seabirds, and determines the carrying capacity (in this case the level of biomass and diversity) of ecosystems and the services they provide. Through its presence and absence plankton regulate larval fish development and survival, and thus the success or failure of recruitment[84] to the adult fish stocks[85].

Marine microbes play a key role in cycling nutrients that are essential for other marine organisms and the ecosystem services they provide[86]. However, there is still a lack of fundamental understanding of the complex roles they play. This means there is insufficient evidence to assign a current or future health status to microbes[87].

Current situation

Long-term observations indicate that plankton as a whole is healthy and subject to few direct anthropogenic pressures. Research has shown the major influence in the distribution of plankton to be climate. However, the consequences of the feedback relationships with the wider ecosystem, fisheries and climate change are not clear[88].

Future trends

Trends in increasing sea surface temperature, eutrophication, ocean acidification and pollution all affect the balance of biomass and diversity within natural community structures[89,90] for instance an increase in sea surface temperature could lead to more diversity in plankton, but less overall biomass. This in turn could lower the carrying capacity of ecosystems. Changes in plankton as a result of rising sea temperatures may impact on other species groups in the pelagic food web. Ocean acidification is expected to impact planktonic ecosystems and especially vulnerable calcareous organisms[91] in the future[92].

New targets for achieving GES in pelagic habitats all focus on plankton, recognising its key role in the marine ecosystem. The targets require that plankton distribution, structure, condition and abundance are not significantly adversely affected by anthropogenic drivers[93].

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[84] Recruitment occurs when juvenile organisms survive to be added to a population
[85] CP2 Chapter 3: Healthy and Biologically Diverse Seas p.34
[86] UK National Ecosystem Assessment, 2011, Chapter 12: Marine
[87] CP2 Chapter 3: Healthy and Biologically Diverse Seas p.33
[88] CP2 Chapter 3: Healthy and Biologically Diverse Seas p.34
[89] http://chartingprogress.defra.gov.uk/feeder/HBDSEG-FeederReport-sec3_2.pdf
[90] Edwards et al. 2012. Global Marine Ecological Status Report: results from the global CPR survey. Available at: www.sahfos.ac.uk/research/publications/ecological-status-report.aspx
[91] Organisms with exposed shells, skeletons or tubes structures formed of calcium (Ca) and carbonate (CO3) based deposits that dissolve in increasingly acidic conditions.
[92] http://chartingprogress.defra.gov.uk/base-food-web
[93] HM Government, 2012, Marine Strategy Part One: UK Initial Assessment and Good Environmental Status

Plankton and microbes are both affected by eutrophication (high water nutrient levels) that can artificially boost certain populations, this is less significant in offshore waters where there is greater mixing and dilution with oceanic waters, the many estuary and river systems in the South marine plan inshore area are more susceptible.

Eutrophication is expected to decline as nutrient inputs from the main sources (sewage treatment works and agriculture) fall due to the measures put in place under the EU Urban Waste Water treatment Directive and EU Nitrates Directives. However recovery from eutrophication in semi enclosed water bodies can take many years, due to the large reservoirs of nutrients in sediments[94].

Habitats

A habitat is the physical surroundings in which organisms live and interact, while a habitat with its associated biological organisms can be defined as a specific biotope.

The South marine plan areas have a particularly high biological diversity as a result of the variety of geophysical features present These included: reefs, mixed sediments, bays, estuaries and different rock types; a diverse array of tidal influence and ranges, with areas of particular complexity and strength around the Isle of Wight, Selsey Bill, Portland Bill and the Straits of Dover; and the boundary of the English Channel and North Sea water bodies which allows the migration of different organisms between these regional seas; all these features present wide range of habitats with associated biodiversity.

The South marine plan areas also is home to a variety of biogenic reef in the made up of a combination of living and dead worms and shells, which are important for stabilising marine sediments and providing habitat for other organisms.

A number of local authorities have used their local plans to protect a variety of habitats including Chichester Harbour AONB who are currently carrying out a program of monitoring on habitats and species in the area, Exeter who are promoting the creation of new habitat through their plans and Dorset AONB who are promoting the creation and management of new semi-natural habitat along their coastal strip.

Figure 4 shows the distribution of benthic (sea bed) habitats across the South marine plan areas at the European Nature Information System (EUNIS) level 3 which is a relatively coarse or broad scale degree of detail that matches the broad nature of the CP2 assessments. EUNIS is a hierarchical system where level 1 contains very broad descriptions of physical habitats moving to level 5, which describe detailed biotopes (physical habitat with associated biological community).

Current situation

Intertidal rock is an abundant and widespread habitat. It is generally in good condition, though under pressure from localised harvesting of edible shellfish, the occurrence of non-native species and climate change[95].

[94] HM Government, 2012, Marine Strategy Part One: UK Initial Assessment and Good Environmental Status

[95] http://chartingprogress.defra.gov.uk/assessment-summary-2

Intertidal sediments are similarly widespread, including sand and shingle beaches, mudflat and salt marsh. Mudflat and salt marsh are considered to be in poor condition and declining, due to historic and ongoing land claim, coastal defence (structures) and pollution. Salt marsh and intertidal sediment habitats adjacent to urban areas are very sensitive to coastal squeeze, where habitats have decreasing space between rigid coastal structures and rising sea level or coastal erosion.

Shallow and shelf sub-tidal sediments are under pressure in all areas and condition is generally on a level trend. Widespread fishing is the activity contributing the most pressure[96] on these habitats with pollution and non-native species also considered a concern.

Future trends

GES targets for reef and rock habitats require that habitat distribution, extent and condition (as well as condition of the benthic community) are either stable or increasing. A lack of evidence on sediment habitats means that current GES targets focus on trends with the intention of setting more specific, quantified targets in the future.

Habitat loss through sea level rise and coastal squeeze is an issue in places like Portsmouth, Langstone and Chichester Harbours[97, 98,99], it reduces the size of important breeding and feeding habitats and ecosystem services such as coastal defence and flood water storage. Mitigation though measures like managed realignment[100] is possible only where it is both technically feasible and where it is socially acceptable.

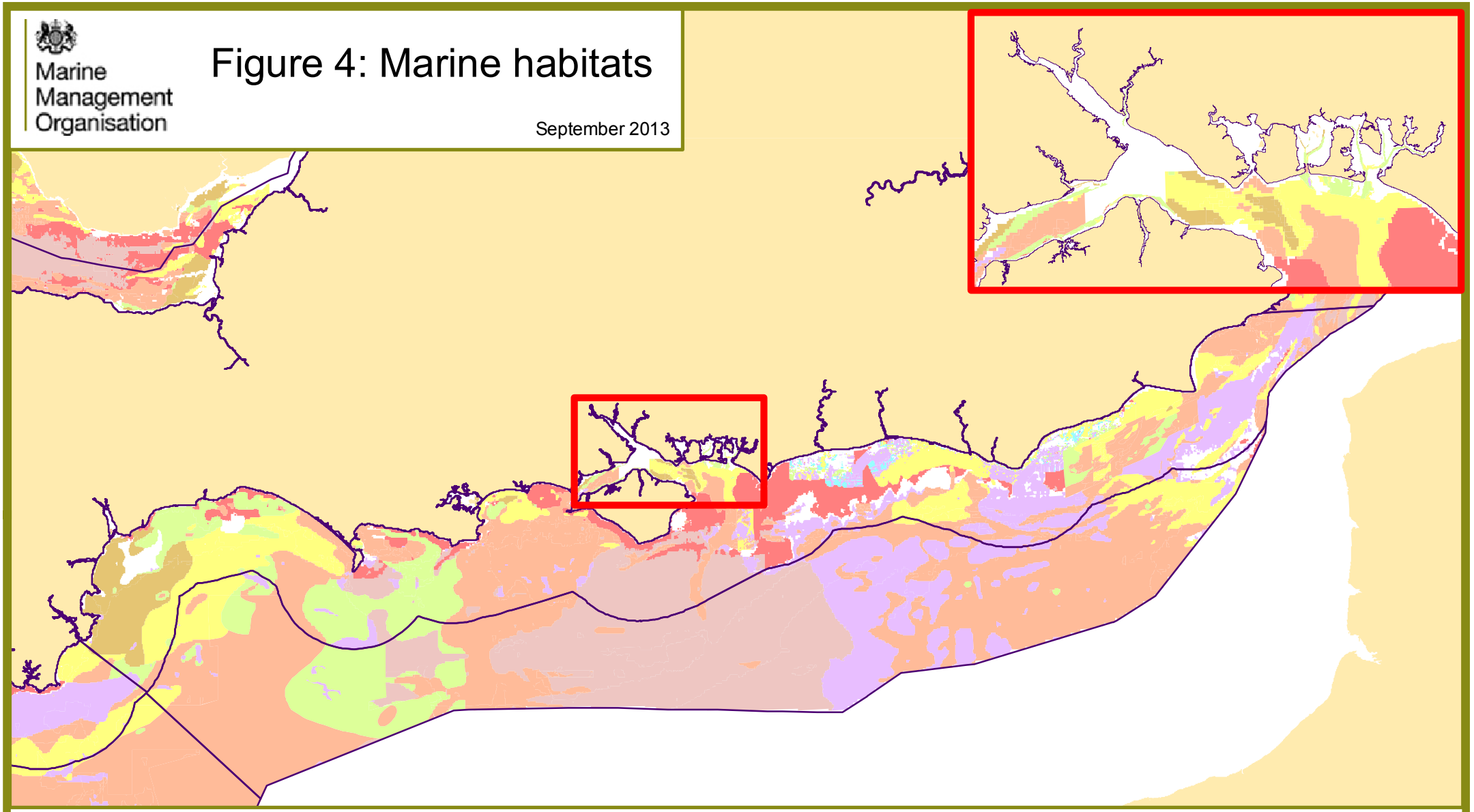
Additional future habitat loss and habitat change is closely linked to ongoing and future human activities.

[96] http://chartingprogress.defra.gov.uk/assessment-summary-2
[97] HBDSEG feeder report sec 3 habitats pp.166,167
[98] Urban Edge Environmental Consulting 2013, HRA for the Portsmouth Site Allocations Development Plan Document: Screening Statement. Available at: www.portsmouth.gov.uk/media/UE-0060_Portsmouth_CC_Site_Allocations_HRA_Screening_6_20130219.pdf
[99] Royal Haskoning (2006) Coastal squeeze, saltmarsh loss and Special Protection Areas. English Nature Research Reports, Number 710. Available at: http://publications.naturalengland.org.uk/publication/62014
[100] Managed realignment is the landward retreat of coastal defences and other hard structures to make space for coastal habitats, these habitats often provide an element of flood and erosion defence in their own right.

Marine Management Organisation

Figure 4: Marine habitats

September 2013



Marine plan areas

Combined survey/ modelled habitat map to EUNIS level 3

- A3.1: Atlantic and Mediterranean high energy infralittoral rock
- A4.1: Atlantic and Mediterranean high energy circalittoral rock
- A4.2: Atlantic and Mediterranean moderate energy circalittoral rock
- A4.3: Atlantic and Mediterranean low energy circalittoral rock
- A5.1: Sublittoral coarse sediment
- A5.2: Sublittoral sand
- A5.3: Sublittoral mud
- A5.4: Sublittoral mixed sediments
- A5.6: Sublittoral biogenic reefs
- A6.2: Deep-sea mixed substrata
- A6.5: Deep-sea mud
- Deep sea coarse sediment

Fish

The MSFD initial assessment discusses the current state of the 330 fish species thought to inhabit the shelf seas surrounding the British Isles. It includes an assessment of Coastal Waters (as defined by the Water Framework Directive), but does not include WFD Transitional Waters (e.g. estuaries, sea lochs and coastal lagoons). The assessment highlights that all parts of the marine fish community have been impacted by human activities, most notably through the direct extraction by commercial fishing. Additional pressures on fish include the removal of non-target fish (predators, prey or competitors) and the physical impacts of fishing gear on essential habitats.

Estuarine fish species are subject to pressure from inputs of pollutants and coastal developments, though a number of initiatives (including those associated with the Water Framework Directive) are helping to improve the physical and chemical quality of rivers and estuaries.

There has been a substantial increase in the number of fish stocks that are harvested sustainably over the period 2000-2011 but there is some way to go before the majority of commercial fish stocks are at safe levels. There are particular concerns over the populations of several fish species that remain severely depleted with respect to the population sizes that are known to have existed 50 or 100 years ago (such as sharks, rays, skates, European eel and salmon).

Current situation

The feeder report for Charting Progress 2[101] describes the South marine plan areas as relatively shallow, with some notable characteristics as follows:

- The deeper waters in the mid-Channel are dominated by thickback sole and red gurnard and the inshore waters are dominated by flatfish (plaice, dab, sole, and solenette) and other inshore species, including lesser weeverfish and common dragonet.
- Species of conservation interest that occur in the South marine plan areas include sea horses which are occasionally caught off Sussex and Dorset.
- Estuarine fish communities are generally considered to be of poor status in the South marine plan areas[102].
- Seabass have dominated catches since 1983 in the river catchments opening into the Solent (Test, Itchen, Hamble, Bealieu and Lymington).
- Salmon numbers have shown declines in many rivers since 1988, with CEFAS and the Environment Agency classifying populations in the Test, Itchen, Hampshire-Avon, Stour, Piddle and Axe as ‘failing’ statutory ‘conservation limits’. However, while uncertain, the populations are thought to be improving in the Frome, Exe, Teign and Dart and there has been evidence of recent increases in both the Test and the Itchen.

[101] Charting Progress 2 Feeder Report: Healthy and Biologically Diverse Seas, http://chartingprogress.defra.gov.uk/feeder/HBDSEG-feeder.pdf
[102] Charting Progress 2 Feeder Report: Healthy and Biologically Diverse Seas, http://chartingprogress.defra.gov.uk/feeder/HBDSEG-feeder.pdf

Future trends

Many species of fish in the South marine plan areas have been impacted by human activity, with the main pressure being extraction by commercial fishing activity[103]. Changes to fishing activity as a result of new management measures e.g. as a result of new marine protected areas or through policy changes including the reform of the Common Fisheries Policy, may see this pressure decrease. Other human pressures include loss of habitat from physical damage (e.g. from anchoring of large ships) and the introduction of hazardous substances[104]. Environmental improvements resulting from the achievement of GES under the MSFD may see an increase in the diversity, health and abundance of fish species through descriptors 1, 4 and 6.

Climate change is beginning to have a detectable impact on fish populations, with marked changes in distribution, timing of migration, reproduction, recruitment and growth rates all being documented. Charting Progress 2 indicated that the mix of species present in the South marine plan areas has changed over the last 50-100 years due to a changing climate, with warm water species such as red-mullet, seabass, anchovy and John Dory spreading rapidly and cold water species retreating northward[105].

The MMO recognises the current limitations in understanding the distribution of fish and has recently commissioned a research project to understand the location of essential fish habitat in the South marine plan areas. It is estimated that this project will be completed in September 2013.

Mammals

The principal marine mammals in English waters are seals and cetaceans (whales, dolphins and porpoises). The grey seal and the common (also called harbour) seal are the two species of seal resident in England. Though there are no major seal colonies in the South marine plan areas there are rare sightings of individual grey seals, and several small populations of harbour seals, that are permanent to the area, these are likely to have originally come from the larger populations on the East coast[106,107].

Thirteen species of cetacean have been recorded on the south coast, seven of these are found year round, with harbour porpoise and bottlenose dolphin being the principal species.

Current situation

Cetaceans found in the South marine plan areas are part of much larger and more widespread international biological populations, which are highly mobile, including some which migrate long distances, and may be present in the South marine plan areas for only part of the time. In addition, there is a variable amount of replicable

[103] HM Government, 2012, Marine Strategy Part One: UK Initial Assessment and Good Environmental Status
[104] HM Government, 2012, Marine Strategy Part One: UK Initial Assessment and Good Environmental Status
[105] HM Government, 2012, Marine Strategy Part One: UK Initial Assessment and Good Environmental Status
[106] http://seawatchfoundation.org.uk/wp-content/uploads/2012/07/SouthwestEngland_small.pdf
[107] www.marine-conservation.org.uk/ukseals.html

survey data so an assessment of their populations does not easily relate to individual marine plan areas. There are some resident or seasonal cetacean pods and individuals; these tend to be located at the western edge of the South marine plan areas.

Charting Progress 2 concluded that the status of harbour porpoise and common bottlenose dolphin species in UK waters was favourable, taking into account the 2007 UK Favourable Conservation Status (FCS) assessments under the EU Habitats Directive. However cetacean status is considered poor in the South marine plan areas, largely as a result of historical bycatch of harbour porpoise in fixed net fisheries, although there is some recent evidence of improvement. The cumulative effects of pressures are of concern and may affect the long-term viability of some species[108].

The harbour seal population in the Solent area establish around 1994 is thought to be made up of 20-25 individuals; the population size appears to be stable or possibly slightly increasing. One or two grey seals may also now be semi-resident in the area[109].

Future trends

It is difficult to predict future trends for seals and cetaceans due to uncertainties in the relationship and influence of pressures on population dynamics, which in themselves are poorly understood[110]. Cetaceans and seals may be displaced by noise associated with offshore wind development and may be impacted indirectly through changes in prey distribution and increased susceptibility to disease and contaminants as a result of warming waters associated with climate change[111].

Targets for achieving GES for marine mammals are all based on existing commitments under the Habitats Directive and relate to distribution, abundance, productivity and impacts of key pressures. Separate targets have been developed for seals and cetaceans due to their differing life histories[112].

[108] HM Government, 2012, Marine Strategy Part One: UK Initial Assessment and Good Environmental Status

[109] Chesworth, J. C., Leggett, V. L. and Rowsell, E. S. (2010). Solent Seal Tagging Project Summary Report. Wildlife Trusts' South East Marine Programme, Hampshire and Isle of Wight Wildlife Trust, Hampshire.

[110] Pinn, E. (2010). Charting Progress 2 Healthy and Biological Diverse Seas Feeder report: Section 3.7: Cetaceans. Published by Department for Environment Food and Rural Affairs on behalf of UKMMAS. p550-591. In: UKMMAS (2010) Charting Progress 2 Healthy and Biological Diverse Seas Feeder Report (Eds. Frost, M & Hawkridge, J).

[111] HM Government, 2012, Marine Strategy Part One: UK Initial Assessment and Good Environmental Status

[112] HM Government, 2012, Marine Strategy Part One: UK Initial Assessment and Good Environmental Status

Birds

Large numbers of sea and water birds are present in the South marine plan areas all year round, with others being seasonal visitors for breeding or over-wintering, such as the Mediterranean gull and Brent goose. Most sea birds spend the majority of their lives at sea, but some stay in inshore waters (e.g. terns, gulls, great cormorant and European shag) and others venture much further offshore and beyond the shelf-break, even during the breeding season. Water birds occur in large aggregations where food is abundant (such as in and around estuaries), with most internationally important aggregations occurring during spring and autumn migrations or during winter.

The South marine plan areas contain important areas for sea and water birds, including areas from Dungeness to Pett Level, Pagham Harbour, Chichester, Langstone and Portsmouth Harbours, the Solent, Southampton Water, Chesil Beach, the Fleet, and Lyme Bay[113]. Langstone Harbour for instance features the UK's largest Mediterranean gull breeding colony, Lyme Bay is seasonally important for the critically endangered Balearic shearwaters[114] and the Dungeness to Pett Levels area include saltmarsh, sand-flats and mud-flats that provide valuable feeding areas for wintering water birds.

Chichester draft local plans contain policy on the importance of protecting bird populations in Chichester and Langstone Harbours. Havant LDF highlights the need to protect the populations of Brent Geese through conservation of their habitat.

Current situation

Pressures such as climate change leading to increasing storm surge during the nesting season (for shoreline nesting species such as the terns), fishing activity (on prey species) and predation (for example foxes), have caused substantial declines in bird numbers in both offshore feeding sea bird species, such as black-legged kittiwakes, and inshore feeding species, such as the herring gull. Species with strong migration and territorial habits are less able to adapt to loss of intertidal feeding habitats and disturbance pressures by shifting to new areas[115].

Future trends

The future status of sea birds and water birds is difficult to predict given the wide range of pressures on them and our lack of knowledge on how they interact. The implementation of MSFD alongside the Birds Directive and subsequent management measures, will aim to help ensure GES targets for birds include ensuring species distribution, population size, condition and productivity are not impacted by human activity. It may also help to increase the resilience of sea bird populations to the

[113] Mitchell, P.I., Austin, G., and Parsons, M. (2010). Charting Progress 2 Healthy and Biological Diverse Seas Feeder report: Section 3.8: Marine birds. Published by Defra on behalf of UKMMAS. Pp.630-633. In: UKMMAS (2010) Charting Progress 2 Healthy and Biological Diverse Seas Feeder report (Eds. Frost,M & Hawkridge, J).

[114] Hallam, D. (2013). Wildlife and Countryside Link SPAR bilateral [meeting] (Personal communication, 18 July 2013).

[115] Hallam, D. (2013). Bob Chapman (Hampshire & Isle of Wight Wildlife Trust), Langstone Harbour site visit [meeting] (Personal communication, 10 July 2013).

effects of climate change[116]. However, despite the introduction of any new management measures, declines in sea bird numbers are anticipated to continue in the short-term as sea birds do not breed until three to nine years old[117].

Although overall abundance for sea and water birds is likely to increase, specific species are likely to experience significant declines. The CP2 feeder report showed the trends for 22 of the species that contributed to the status analysis of the South marine plan areas were relatively stable or increasing with an overall net increase in bird numbers. However of the species that are in decline, four have been in long-term decline having began at least by the early 1990s. A further seven have been in decline since the late 1990s. Six of these 11 declining species trends stand at their lowest levels since the 1975/76 baseline.

[116] HM Government, 2012, Marine Strategy Part One: UK Initial Assessment and Good Environmental Status

[117] RSPB (2013). Marine strategy framework directive consultation (MSFD) – RSPB response.

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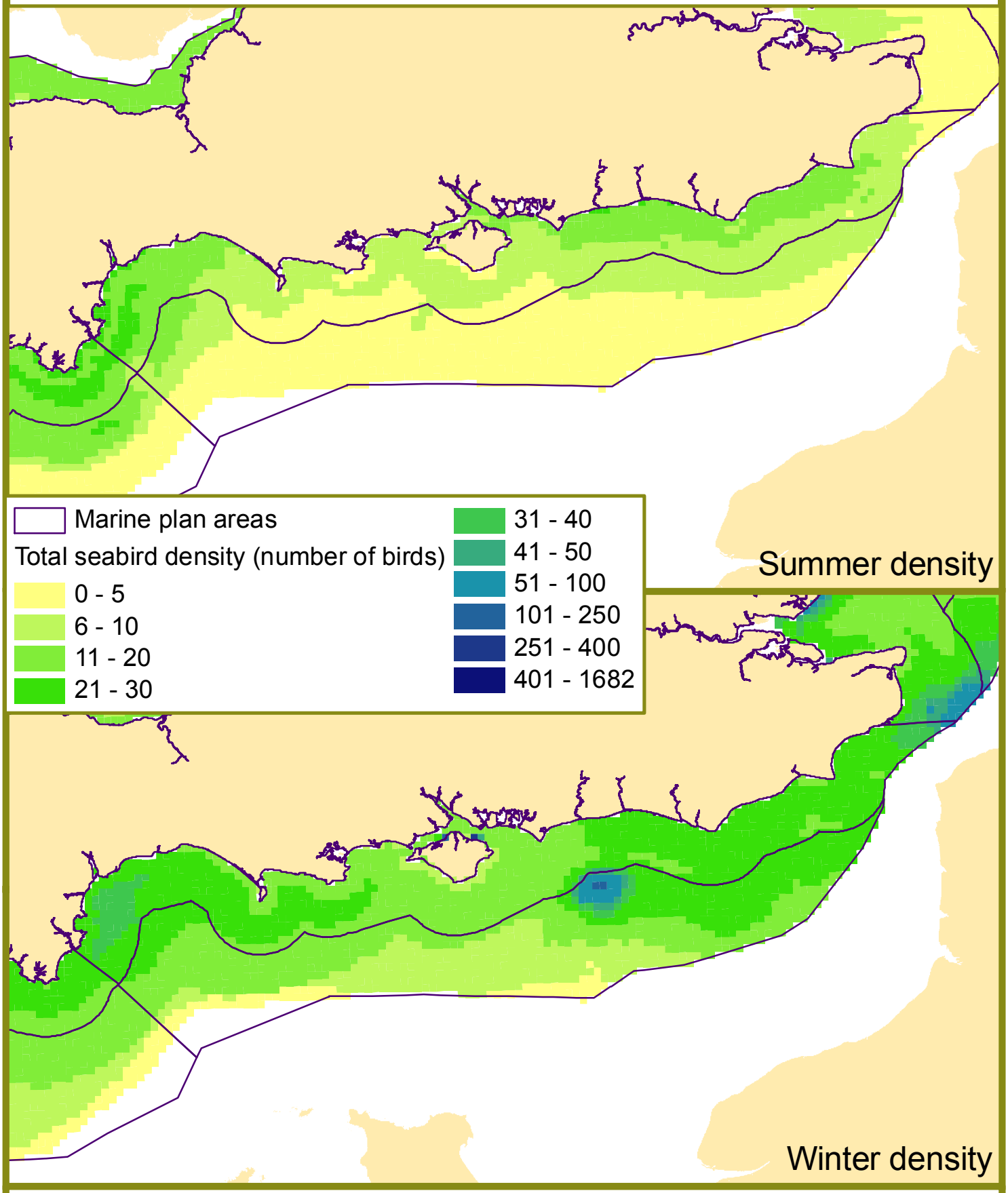
Figure 5: Seabird density (both summer and winter)

September 2013



Protection of habitats and species

As part of an ecosystem-based approach to nature conservation the UK administrations are committed to having a well-managed network of MPAs by 2016; under international agreements including the Convention on Biological Diversity[118] and the OSPAR Convention[119]. A MPA network is a key measure towards achieving GES as required by the MSFD[120]. The sites in the network will work together to provide more benefits than an individual conservation area could on its own. All those areas established under international, European and national legislation with a marine component will contribute to this network and include:

- Special Areas of Conservation (SAC) designated under the Habitats Directive[121]
- Special Protection Areas (SPA) classified under the Birds Directive[122]
- Sites of Special Scientific Interest (SSSI) with marine components designated under the Wildlife and Countryside Act 1981(as amended)
- Marine Conservation Zones (MCZ) designated under MCAA 2009
- Ramsar sites (wetlands of international importance) designated under the Ramsar Convention[123] on Wetlands, 1971.

The MPS requires that appropriate weight is attached to designated sites and protected species and also to habitats and species of principal importance for the conservation of biodiversity[124] beyond the boundaries of MPAs. Marine planning has a role in delivering the requirements of the MPS and in supporting the coherence of the MPA network in general. Details of features of conservation importance and existing designations can be found on the MMO planning portal[125].

Current situation

Figure 6 shows the distribution of MPAs across the South Inshore and Offshore marine plan areas. table 3 which provides further details for each type of designation, the number of sites and area covered.

[118] www.cbd.int/
[119] www.ospar.org/content/content.asp?menu=00340108070000_000000_000000
[120] Article 13(4) http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2008:164:0019:0040:EN:PDF
[121] http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:31992L0043:EN:HTML
[122] http://ec.europa.eu/environment/nature/legislation/birdsdirective/index_en.htm
[123] www.ramsar.org/cda/en/ramsar-home/main/ramsar/1_4000_0__
[124] HM Government, 2011, Marine Policy Statement, paragraph 2.6.1.5.
[125] http://planningportal.marinemanagement.org.uk/

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Figure 6: Marine protected areas

July 2013

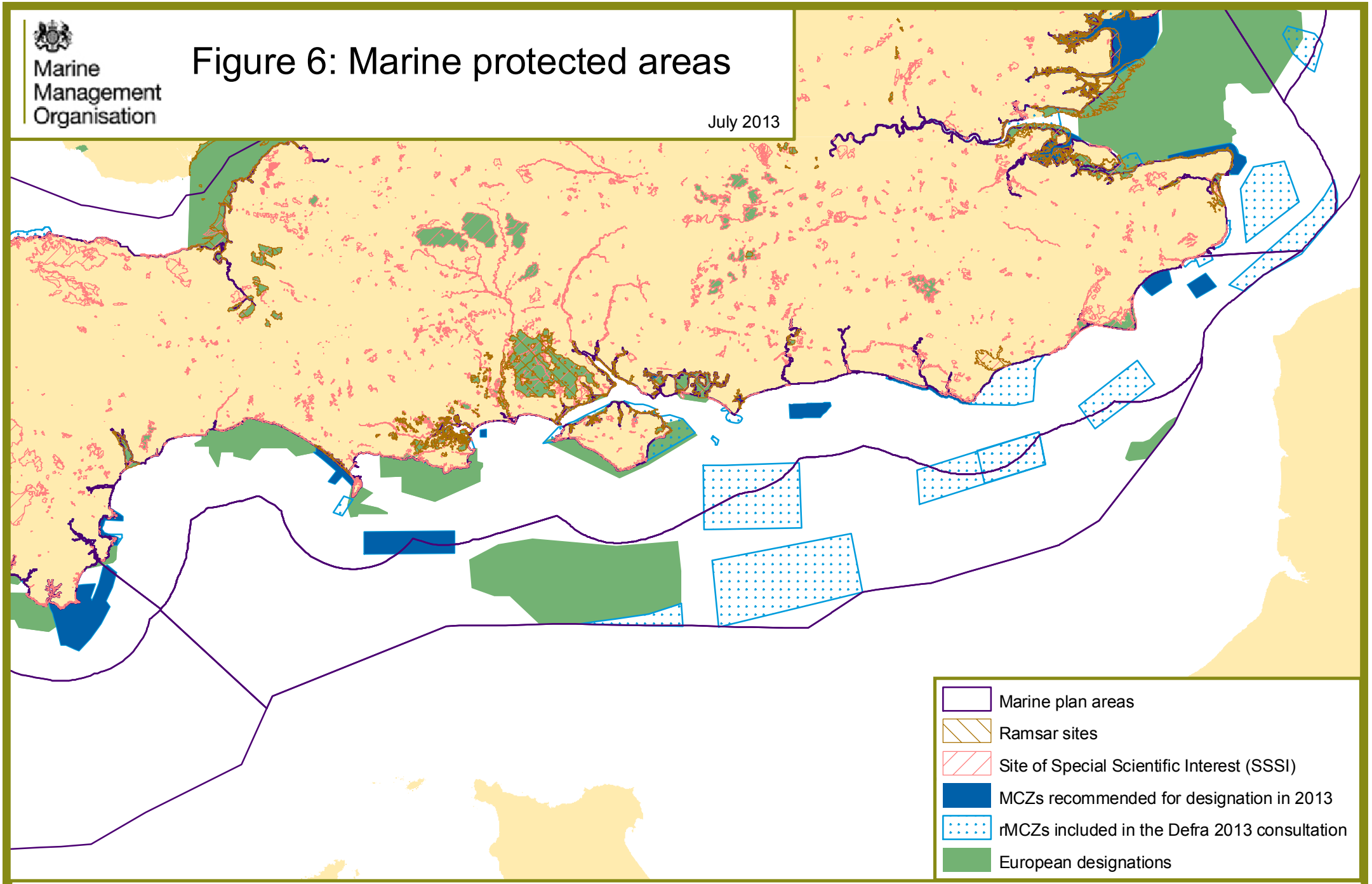

Table 3. Number, area coverage, and distribution of all designated sites in the South Inshore and Offshore marine plan areas (as at May 2013).

	South Inshore	South Offshore
Number of SPA sites	11	0
Area covered by SPA km²	142	0
% of marine plan area covered by SPA	1	0
Number of SAC sites	38	2
Area covered by SAC km²	967	1442
% of marine plan area covered by SAC	9	13
Number of Ramsar sites	10	0
Area covered by Ramsar sites	139	0
% of marine plan area covered by Ramsar sites	1	0
Number of SSSI sites	267	0
Area covered by SSSI km²	168	0
% of marine plan area covered by SSSI	2	0
Number of tranche 1 MCZs	12	1
Area covered by tranche 1 MCZs	362	51
% of marine plan area covered by tranche 1 MCZs	3	<1

Note: The table provides a count for each marine plan area which a designated site overlaps, and therefore if a site overlaps with more than one marine plan area it will be counted within each. The SAC data includes candidate SACs (cSACs) and Sites of Community Importance (SCIs). The SPA data includes SPAs with boundaries that overlap the English marine plan areas and are designated for either a marine or terrestrial species.

There are currently 11 SPAs with marine components, covering 1% of the South Inshore marine plan area. These contribute 2% to the total English SPA coverage. These sites are designated to protect sea birds, waders and waterfowl and cover areas important for migration, breeding and aggregation. The SPAs in the South marine plan areas are largely coincident with Ramsar sites. There are no SPAs in the South Offshore marine plan area.

There are 38 SACs in the South Inshore plan area and two in the South Offshore plan area covering 9% and 13% of the plan areas respectively. Despite the relatively high frequency of SACs compared to other plan areas, the sites tend to be small, and therefore contribute only 9% to the total English SAC coverage. The sites cover a range of habitats including biogenic and stony reefs, coastal lagoons, coastal sand dunes, shingle, sea cliffs and sea caves, tidal rivers and estuaries, mudflats, seagrass and salt marsh.

The Solent Maritime SAC contains large aggregations of Atlantic salt meadow and represents the only example of a site at which the smooth cord-grass, *Spartina*

alterniflora, is found in the UK, and one of only two UK sites at which significant expanses of the small cord-grass *Spartina maritime*, are found[126].

There are 267 coastal SSSIs in the South Inshore plan area, designated under the Wildlife and Countryside Act 1981 (as amended), covering around 1% of the plan area. These are cited for their biological and geological interest features. The sites contain intertidal habitats and always have a terrestrial component as they do not extend below the low water mark.

As an illustration of the conservation importance of parts of the South marine plan areas, note that almost the entire coast of the Isle of Wight is subject to conservation designations of one type or another.

Future trends

Work is underway by the SNCBs to identify further fully marine SPAs in order to provide additional protection in line with the legislation. The areas of search (AoS) for new sites are available on the JNCC website[127] as a series of maps, which show locations in the South Inshore marine plan area are being considered for the protection of Balearic shearwater.

There are four marine habitats and four marine species present in UK waters away from the coast for which the European Commission has stated that additional SACs must be designated. These are submerged sandbanks, submerged or partially submerged sea caves, reefs, submarine structures made by leaking gases, grey and harbour seals, bottlenose dolphin and harbour porpoise. The SNCBs are currently working to identify additional sites. Although the South marine plan areas have potential Annex 1 habitat present, there are currently no AoS[128] undergoing investigation and survey within the plan areas.

The MCAA created a new type of MPA called a Marine Conservation Zone (MCZ) to protect nationally important marine wildlife, habitats, geology and geomorphology. MCZ sites will be selected to protect not just the rare and threatened, but the representative range of marine wildlife.

The South Inshore plan area has 12 recommended MCZs included in the first tranche for designation; this number is second only to the South West Inshore plan area which has 24 recommended sites. The South Offshore plan area has only one recommended MCZ in the first tranche. The recommended sites partially overlap existing Natura designations, affording protection to habitats and species which are currently not protected under European legislation. MCZs will have variable levels of protection depending on their features of interest. This will ensure that a network of sites can be achieved in a way that minimises adverse impacts on sea users and maximises benefits for nature conservation.

Since the consultation period finished, the government is now considering which MCZs to designate in 2013. Defra is expected to announce future tranches of MCZ

[126] James et al, 2010. The South Coast Regional Environmental Characterisation. British Geological Survey Open Report OR/09/51.
[127] http://jncc.defra.gov.uk/pdf/SPA_AOS_Maps%2020100304.pdf
[128] http://jncc.defra.gov.uk/page-4543

designations in the autumn of 2013 in conjunction with decisions on other environmental priorities within the limits of available resources[129]. Two sites in the South marine plan areas included in the regional MCZ project recommendations will not be considered further as socio-economic costs were considered to outweigh the conservation benefit[130].

The conservation benefits achieved by designation depend on the features present, conservation objectives and effective management. Any restrictions on activities will be determined by their potential impact on protected features and the management measures in place to achieve the conservation objectives. Protection of areas outside of sites is also provided by existing measures such as strategic environmental assessments and environmental impact assessments which require applicants to consider features outside of designated sites. The MMO has developed a strategic approach to MPA management, and have developed a table[131] providing information about designated sites, including some of the SNCB advice about the impact of human activities upon site features[132]. The management measures for a number of proposed sites are still to be defined, with potential implications for activities.

In March 2012, the government published a review of the implementation of the Habitats Directive and Wild Birds Directive[133], with particular reference to the burdens placed on business through the regulatory process. Defra identified four key areas where change will improve the implementation of the Directives. These are:

i. Facilitating nationally significant infrastructure projects
ii. Improving implementation processes and streamlining guidance
iii. Improving the quality, quantity and sharing of data
iv. Improving the customer experience

A number of measures were identified to implement the changes required, to demonstrate how economic and environmental objectives are both compatible and central to long-term sustainable development.

In addition, in August 2012, Defra announced a revised approach to managing fishing activity in European Marine Sites (EMSs). The revised approach applies to all EMSs and potential SPAs and possible SACs in England and will promote sustainable fisheries while conserving the marine environment and resources, securing a sustainable future for both. It aims to ensure that, in order to comply with Article 6 of the Habitats Directive, management measures are identified for high risk

[129] Defra, 2013, Marine Conservation Zones: Consultation on proposals for designation in 2013. Summary of responses. www.gov.uk/government/uploads/system/uploads/attachment_data/file/212695/mcz-consult-sum-resp-20130716.pdf
[130] www.gov.uk/government/uploads/system/uploads/attachment_data/file/82730/mcz-condoc-121213.pdf
[131] www.marinemanagement.org.uk/protecting/conservation/documents/mpas_risk.pdf
[132] Note: this table includes only the advice in relation to activities for which the MMO has management responsibility.
[133] Defra 2012 Report of the Habitats and Wild Birds Directives Implementation Review. Available at: www.gov.uk/government/uploads/system/uploads/attachment_data/file/69513/pb13724-habitats-review-report.pdf

features by December 2013, and any additional fishery management measures for the conservation of the abovementioned sites are in place by 2016.

Potential key issues

This section summarises some of the potential key issues in relation to marine ecology in the South marine plan areas.

Climate change may have implications for the protection of habitats and species. The temperature conditions within an MPA may become unsuitable for a particular species with time[134]. Management practices within these areas will need to be closely monitored to ensure that if habitats or species become stressed due to climate change, they can still withstand the human pressures put upon them. This is particularly relevant to mobile species. For example, if an area is created to protect a certain fish spawning ground and the fish move out of that area due to rising temperatures, the protected area boundaries may have to be flexible to ensure that the fish are still protected. Where licence conditions are in place to protect a mobile species, they may need reviewing if the species moves as a result of climate change[135].

Within the South marine plan areas local and regional interests highlighted that sea-level rise as a result of climate change, potential impacts of extreme weather events and 'coastal squeeze' associated with urban, industrial and sea defence development are all significant threats to the long-term maintenance of habitat diversity and structural integrity. The incremental loss of fringing habitats and transitional communities is a threat, particularly for those sensitive habitats that are not formally protected such as some areas of sea grass and habitat complexes like the Dart Estuary[136, 137, 138].

The South marine plan areas are very busy, with co-location of activities being the norm. The perception of many stakeholders is that if management measures result in displacement of an activity, there is little opportunity to relocate[139]. An example is the statutory closure of Lyme Bay SAC to mobile gears, which has caused conflict between mobile and static sectors of the fishing industry. Work is underway to establish a community managed SAC, with a voluntary code of conduct introduced for users[140]. The further development of the network of Marine Protected Areas, changes to management measures in current designated areas and implementation of the Marine Strategy Framework Directive could all increase the potential for conflict with industry.b

[134] Jones, M.C., et al., 2013, Predicting the impact of climate change on threatened species in UK waters Plos One 8,1:1-13.
[135] Townhill, B.L., et al, 2013, Marine Management Organisation Climate Change Adaptation Reporting - Feeder Report A report to the MMO.
[136] Hallam, D. (2013). Natural England SPAR bilateral [meeting] (Personal communication, 11 July 2013).
[137] Hallam, D. (2013). Natural England SPAR bilateral [meeting] (Personal communication, 11 July 2013).
[138] Hallam, D. (2013). Wildlife and Countryside Link SPAR bilateral [meeting] (Personal communication, 18 July 2013).
[139] Redhead, J. (2013). Natural England SPAR bilateral [meeting] (Personal communication).
[140] www.lymebayreserve.co.uk/

Interactions with other sectors

The UK National Ecosystem Assessment (UKNEA) took place between 2009 and 2011, providing an analysis of the contribution of the natural environment to society and economic prosperity. As such it helps to provide context for the current state of and future trends within the natural marine environment. The UKNEA[141] found that the diversity of marine organisms and habitats provide a range of ecosystem services and benefits, which are strongly interlinked. These benefits are of significant value to the UK society, and include:

- food (fish, shellfish);
- reduction of climate stress (carbon and other biogas regulation);
- genetic resources (for aquaculture);
- blue biotechnology (e.g. biocatalysts, natural medicines);
- fertiliser (seaweed);
- coastal protection;
- waste detoxification and removal and disease and pest control;
- tourism, leisure and recreation opportunities;
- a focus for engagement with the natural environment;
- physical and mental health benefits; and
- cultural heritage and learning experiences.

Although the goods and services provided by the natural marine environment are typically experienced by those that live by or visit the coast, many, like renewable energy and food, both directly and indirectly benefit much of the UK's society[142].

The benefits brought by ecosystem services are poorly quantified; therefore it is difficult to fully understand the impacts of human activities. As discussed in the above sections, changes in sea temperature are already affecting species populations and habitat distribution, which in turn drives alterations to community structure and function. Climate change could also affect human health through the increase of optimum conditions for marine pathogens; however it may bring benefits to cultural ecosystem services through warmer summers.

Human activities which have a physical impact on seafloor integrity damage regulating and supporting services. While impacts are quite localised, trawling activity has the most widespread impact, with food provision also being affected by overexploitation[143].

Increasing activity in other marine sectors is putting additional pressure on the marine environment and the services it provides. Interactions with renewables, shipping and fisheries activities can cause displacement from feeding grounds and the most efficient flight paths, increasing the energy requirements for birds. There is also a collision risk depending on the design and location of large-scale

[141] UK National Ecosystem Assessment Technical Report, Chapter 12
[142] UK National Ecosystem Assessment Technical Report, Chapter 12
[143] UK National Ecosystem Assessment Technical Report, Chapter 12

infrastructure and the possibility diving birds may become entangled in fishing nets[144,145].

Healthy bird and mammal populations bring value for tourism and recreation through wildlife watching and employment at reserves. Poole Harbour SPA is a good example of this, where the shallow waters and intertidal habitats are home to significant numbers of wintering, migrating and breeding birds and also attract a range of recreational users from birdwatchers to those undertaking watersports, walking and cycling. Poole Harbour is one of six case study sites for the VALMER project, where the monetary and non-monetary benefits derived from recreation are being investigated.

However, interactions with coastal tourism and recreation can cause disturbance to birds and other organisms. This may restrict or alter their natural behaviours particularly foraging and eating. In more localised areas there are also issues of collision with recreational users.

Issues for sustainability

There are potential cumulative effects with all the interactions highlighted, the most significant is likely to be the high frequency and duration disturbance pressures caused by small-scale tourism and recreation activities. These may include coastal walking, canoeing, boating, dog walking, kite surfing and general coastal access[146147,148,149].

Cetaceans are vulnerable to collision, pollution and underwater noise, particularly from construction of renewable energy infrastructure, ports and sonar. There are however difficulties in making direct links between individual pressures and their impact. There are potential issues of cumulative effects of multiple noise sources as marine construction and vessel movements increase.

Unregulated and unsustainable seaweed gathering, hand gathering of shellfish and bait digging is also a cumulative effect issue leading to physical damage, unsustainable reduction in biomass and disturbance issues[150].

[144] Hallam, D. (2013). Natural England SPAR bilateral [meeting] (Personal communication, 11 July 2013).
[145] Hallam, D. (2013). Wildlife and Countryside Link SPAR bilateral [meeting] (Personal communication, 18 July 2013).
[146] Hallam, D. (2013). Natural England SPAR bilateral [meeting] (Personal communication, 11 July 2013).
[147] Hallam, D. (2013). Natural England SPAR bilateral [meeting] (Personal communication, 11 July 2013).
[148] Hallam, D. (2013). Wildlife and Countryside Link SPAR bilateral [meeting] (Personal communication, 18 July 2013).
[149] Hallam, D. (2013). Wildlife and Countryside Link SPAR bilateral [meeting] (Personal communication, 18 July 2013).
[150] Hallam, D. (2013). Natural England SPAR bilateral [meeting] (Personal communication, 11 July 2013).

2.3 Historic environment

The historic environment includes aspects resulting from the interaction between people and places through time, including all surviving physical remains of past human activity, whether visible, buried or submerged. Those elements of the historic environment – buildings, monuments, sites or landscapes – that have been positively identified as holding a degree of significance meriting consideration are called 'heritage assets[151].

Current situation

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 for the benefit of this and future generations. In the English marine area, designated heritage assets may include: [152].

- scheduled monuments designated under the Ancient Monuments and Archaeological Areas Act 1979
- protected wreck sites designated under the Protection of Wrecks Act 1973
- sites designated under the Protection of Military Remains Act 1986

Many heritage assets with archaeological interest in these areas are not currently designated as scheduled monuments or protected wreck sites but are arguably of great if not equal significance. The absence of designation for such assets does not necessarily indicate lower significance. Sites of historic interest are distributed throughout the marine environment and around the coast and hinterland. Equal value can be attributed to these features in every marine plan area and no one area ranks as more significant than another[153].

English Heritage published the National Heritage Protection Plan[154] in May 2011. This sets out the priorities which English Heritage will dedicate resources to in the years 2011 to 2015 for all aspects of national heritage, spanning both the pre-historic and historic periods.

In October 2011 English Heritage produced the guidance 'The Setting of Heritage Assets'[155]. This guidance sets out advice on managing change within the settings of heritage assets including archaeological remains and historic buildings, sites, areas, and landscapes. It provides detailed advice intended to assist implementation of 'Planning for the Historic Environment' and its supporting Historic Environment Planning Practice Guide [156], together with the historic environment provisions of the NPS for nationally significant infrastructure projects.

[151] HM Government (2011) MPS para 2.6.6.1. Available online at: www.defra.gov.uk/publications/files/pb3654-marine-policy-statement-110316.pdf
[152] HM Government (2011) MPS para 2.6.6.4. Available online at: www.defra.gov.uk/publications/files/pb3654-marine-policy-statement-110316.pdf
[153] MMO (2013). Strategic Scoping Report for marine planning in England, p60
[154] English Heritage (2011). National Heritage Protection Plan. Available online at: www.english-heritage.org.uk/professional/protection/national-heritage-protection-plan/all-about-NHPP/
[155] English Heritage (2011). The Setting of Heritage assets. Available online at: www.english-heritage.org.uk/publications/setting-heritage-assets/
[156] English Heritage (2012). Historic Environment Planning Practice Guide. Available online at: www.english-heritage.org.uk/publications/pps-practice-guide/pps5practiceguide.pdf

The South marine plan areas contain a unique and diverse historic environment both along the coastline and beneath our seas. This environment has been impacted extensively by past human activities ranging from early human occupation stretching back some 80,000 years to more modern military, commercial and cargo wreck sites of the twentieth century. Strong historic associations to iconic landscapes such as the white cliffs of Dover form part of our national identity when leaving and returning to England by sea. To the west of the plan areas the Jurassic Coast covers 95 miles of coastline from East Devon to Dorset, with rocks recording 185 million years of the Earth's history. Table 4 below details a local perspective of historic features within the South inshore and offshore marine plan areas.

Table 4: taken from South Seascape Assessment Key Characteristics [157]

Area	Key Characteristics
Lyme Bay	• Designated as part of the Dorset and East Devon World Heritage Site ('Jurassic Coast'). • Nationally important Berry Head Fort and Hardy's Head Battery occupying a prominent position above Tor Bay as part of a strong assemblage of defensive structures along the wider coastline. • Defensive coast with strong associations with the Napoleonic and Second World Wars, including D-Day landing practices. German bombers and submarine casualties litter the seabed. • Strong historic associations with international trade and smuggling linked to the wider English Channel and the MCA's historic ports – including the ship building port of Lyme Regis. Favourable climatic conditions enabling people to thrive in this part of the world for thousands of years. Evidence of Palaeolithic man found in the 'Brixham Bone Caverns' dating back 31,000 years.
Portland Bill to Christchurch	• Wreck site of HMS Golden Sunset which foundered off The Shambles in 1918 • Long history of maritime trade associated with the historic port of Poole and Christchurch Harbour (the latter linking to the Avon and Stour rivers); their strategic location exploited by the Romans and earlier settlers. • Protected Wreck Sites – Cargo Vessels, the Studland Bay and the Swash Channel • Christchurch Priory, with origins from the 11th century, forming a prominent navigational feature in views from across Christchurch Bay.
The Solent and Isle of Wight	• Large number of historic shipwrecks, particularly off the Needles and the eastern entrance of the Solent, including Henry VIII's flagship the *Mary Rose*. • Long history of maritime trade, seafaring and defence, with relics including Henry VIII's Hurst Castle and the 19th century Palmerston Forts guarding the eastern entry to the Solent. The Royal Naval Dockyard is based at Portsmouth.

[157] MMO (2013), Seascape Assessment for the South Marine Plan Areas (to be published)

Area	Key Characteristics
	• Evidence for human occupation stretching back some 80,000 years, before the island was created. Bronze Age round barrows on the chalk ridge are visible from the coast and surrounding seas.
Selsey Bill to Beachy Head	• Historic features illustrate the strategic defensive role of this coastline. The last in the series of Martello Towers is located at Seaford and forts survive at Newhaven, Littlehampton and Shoreham. • A large number of wreck sites indicate the history of trade, transport and military activity in the area and are popular diving sites. The protected wreck 'The Black Cat Wreck' at Brighton Marina is thought to be one of the oldest shipwrecks known in England. • Offshore at Beachy Head many boats and sea going vessels have fallen foul of the difficult water conditions. Wrecks include the Polynesia, a German sailing ship that ran aground in 1890 which is sometimes visible at low tide at Cuckmere Haven.
Beachy Head to Dungeness	• Historic coastal landscape displayed in the prehistoric petrified forest at the beaches of Pett Level and Bulverhythe. Land was dry during the Neolithic period, before the end of the last glaciation. • Protected wreck sites illustrating the historic use of the seas for global trade and war from the 16th centuries, including two visible on the beaches of Bulverhythe and Pett Level at very low tide.
Dungeness to Dover	• Nationally important 19th century Martello Towers linked to Napoleonic history, spread along the length of the coast from Dymchurch to Folkestone, also acting as navigation marks when viewed from the sea. • Large number of wreck sites recorded around Dover and Folkestone including submarines, cargo vessels and steamships. • The Dover Strait as a whole has played a key role in the defence of Britain and formed the location for successive invasions and defence – the cliffs being the first defence for invasion by Julius Caesar in 55 BC. • Particular references to World War II, including the Battle of Britain memorial and the fortifications and wartime tunnels at Dover Castle and Western Heights. • The protected wreck of the Langdon Bay (English Heritage), located on the edge of Dover Harbour, thought to be the remains of a Bronze Age vessel carrying a scrap metal cargo from France to Britain, indicating cross-channel trade in the Middle Bronze Age. • Skyline dominated by Dover Castle – long forming an important land and navigation mark the site of a Roman lighthouse, and symbolic of the defence of the British Isles. • Iconic seascape – with the white cliffs of Dover forming part of our national identity – a visual reference for leaving and returning to England by sea.
South offshore	• Contains a large part of the English Channel Outburst Flood Feature providing evidence of the flood which created the channel

Area	Key Characteristics
marine plan area	separating England from mainland Europe. • Remains of B17 Flying Fortress aircraft and German submarines from World War I around the Dover Strait. • The Channel's turbulent past reflected in the wrecks of cargo and military vessels including the First and Second World Wars. Concentrations of ship wrecks of international origin litter the seabed. • Direct legacy of the wider Channel in the defence of Britain and the location for successive invasions - Romans, Norman Conquest, Napoleonic and the two World Wars.

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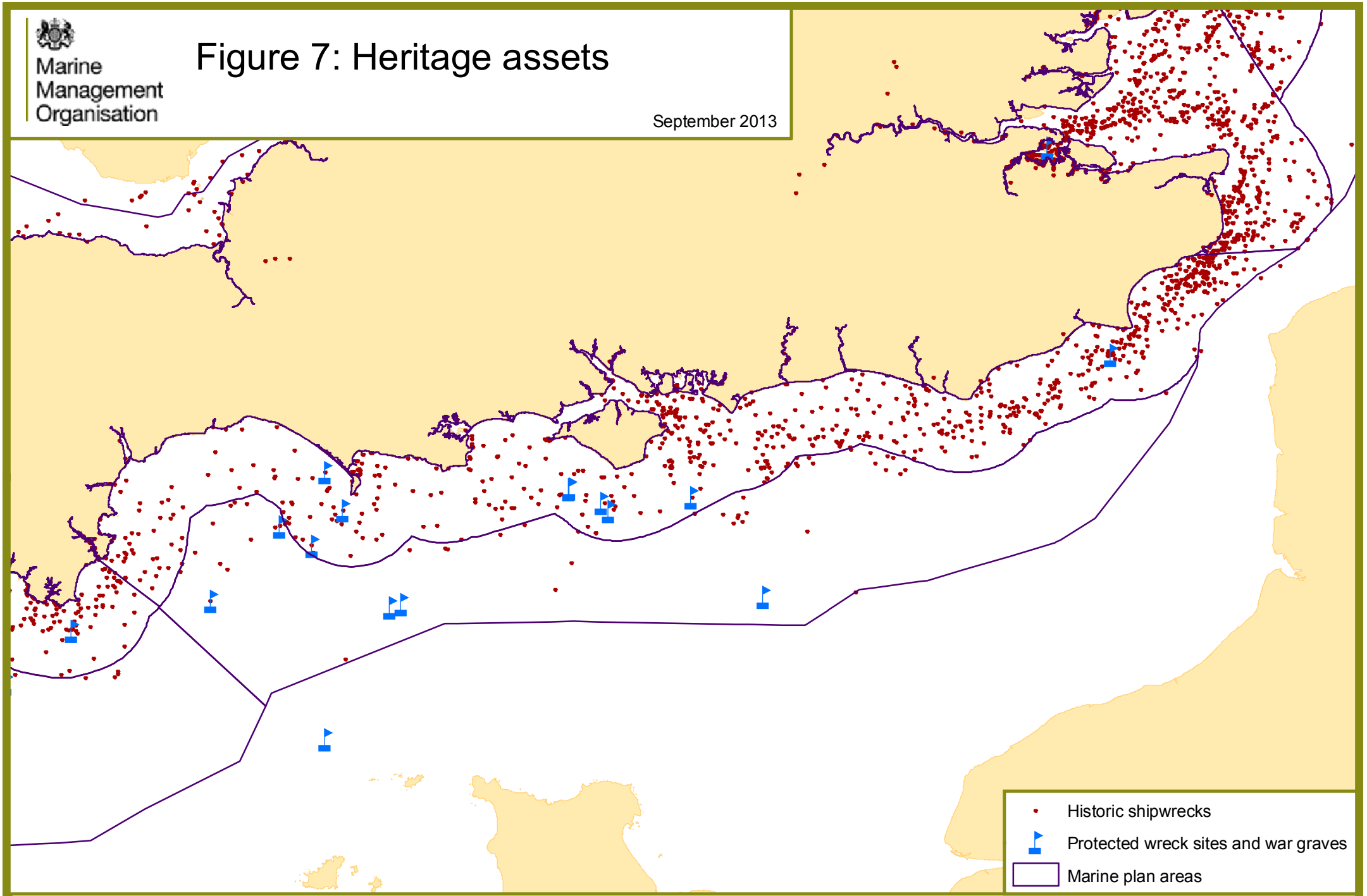
Figure 7: Heritage assets

September 2013



Potential Key issues

- effects of new infrastructure development or activities on existing heritage assets or historic environment
- effects of increased footfall on coastal historic environment and heritage assets
- effects of coastal erosion and damage caused by the sea to heritage assets

Interactions with other sectors

- effects of renewable energy development and cable landfalls may have on the historic environment
- tourism – visitor attractions

2.3.1 Seascape

The Marine Policy Statement (MPS) describes seascape (for the purposes of planning) as meaning landscapes with views of the coast or seas, and coasts and the adjacent marine environment with cultural, historical and archaeological links with each other.

Current Situation

Following the publication of "An Approach to Seascape Characterisation"[158] produced by Natural England and the first strategic scale character assessment for the East Inshore and East Offshore marine plan areas[159], the MMO has recently undertaken work to produce a seascape assessment for the South Inshore and South Offshore marine plan areas which will be published in autumn 2013[160].

The study comprises a strategic scale character assessment, using Natural England's 'approach' and a visual resource study which is the first of its type designed specifically for the marine planning process. Once an approach to visual resource is finalised it can be used alongside Natural England's "An Approach to Seascape Characterisation" in the development of subsequent studies undertaken by the MMO for other marine plan areas.

English Heritage's programme of Historic Seascape Characterisation (HSC) nears completion of national coverage of England's coast (inshore and offshore regions) with full national coverage expected by January 2014. HSC also extends to coastal land, presenting its maritime perspective, overlapping and complementing the 'terrestrial perspective' provided by English Heritage's 'Historic Landscape Characterisation' (HLC) programme[161].

[158] Natural England (2011). An Approach to Seascape Characterisation. Available online at: http://publications.naturalengland.org.uk/publication/2729852

[159] Natural England (2011). Seascape Characterisation around the English Coast (Marine Plan Areas 3 and 4 and Part of Area 6 Pilot Study). Available online at: http://publications.naturalengland.org.uk/publication/2736726

[160] MMO (2013). Seascape Assessment for the South Marine Plan Areas (Marine Plan Areas 6 and 7).

[161] More information available at: www.english-heritage.org.uk/professional/research/landscapes-and-areas/characterisation/historic-seascape-character/

Natural England is currently working to produce a suite of refreshed National Character Area (NCA) profiles[162]. These NCAs divide the English mainland into 159 distinct character areas. Each is defined by a unique combination of landscape, biodiversity, geodiversity and cultural and economic activity. The MMO is working closely with Natural England to align coastal NCAs with the South seascape assessment and subsequent studies around the English coast.

The majority of local authorities have made specific reference to protecting or maintaining both the views and character of particular coastal locations and stretches of river within their jurisdiction. This can also be said for the AONB management plan which linkages between plans should be taken in consideration with one another.

Work to undertake more local scale seascape studies are being carried out by some local authorities. Once complete these studies will help to underpin the seascape assessment being undertaken across the South marine plan areas.

Character of the South marine plan areas

The South Inshore and Offshore marine plan areas contain rich and diverse coastline and marine environment. The coast includes a range of communities, both urban and rural, which vary in wealth and current opportunities for employment. The South marine plan areas benefit from unique coastlines including iconic landscapes such as the white cliffs of Dover, grey cliffs of Portland stone and the fossil rich cliffs of the Dorset and East Devon World Heritage Site (Jurassic Coast). Other prominent landmarks such as The Needles (Isle of Wight), and lighthouses at Anvil Point and Portland Bill have been used for generations acting as navigational marks for commercial and recreational shipping.

A number of traditional fishing activities take place in the South inshore marine plan area including commercial fishing for species such as mackerel, herring, bass and lobsters and crabs. Marine mammals such as basking sharks and dolphins may also be present. Coastal tourism and recreation is also a feature of the inshore areas including recreational fishing and water sports. The Solent's sheltered waters also attract some of the largest numbers of marine recreational users in north eastern Europe, supported by a large number of yacht clubs and marinas and world-class sailing events.

The South offshore marine plan area is dominated by commercial shipping activity and is one of the busiest shipping channels in the world. It supplies goods though the English Channel to wider Europe and across the Atlantic. The offshore area also contains a large part of the English Channel Outburst Flood Feature which provides evidence of the flood which created the channel separating England from mainland Europe.

The South marine plan areas are strongly associated with the defence of Britain including its role in the Anglo-Dutch Wars and both World Wars. Wrecks are littered across the seabed providing evidence of the Channel's turbulent past as well as its

[162] Natural England. National Character Areas. Available online at: www.naturalengland.org.uk/publications/nca/default.aspx

long and continuing role as an international trade route. Today the coastal area and marine environment has strong military defence infrastructure including naval ports and training and exercise areas on land and at sea.

More information can be found in the recent Seascape Assessment for the South Marine Plan Areas[163].

[163] MMO (2013), Seascape Assessment for the South Marine Plan Areas (to be published)

Figure 8: Draft marine character areas

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Note: these areas are under consultation untill 15th September. Descriptions of character types can be found here: http://www.marinemanagement.org.uk/marineplanning/areas/documents/south-seascape-characteristics.pdf

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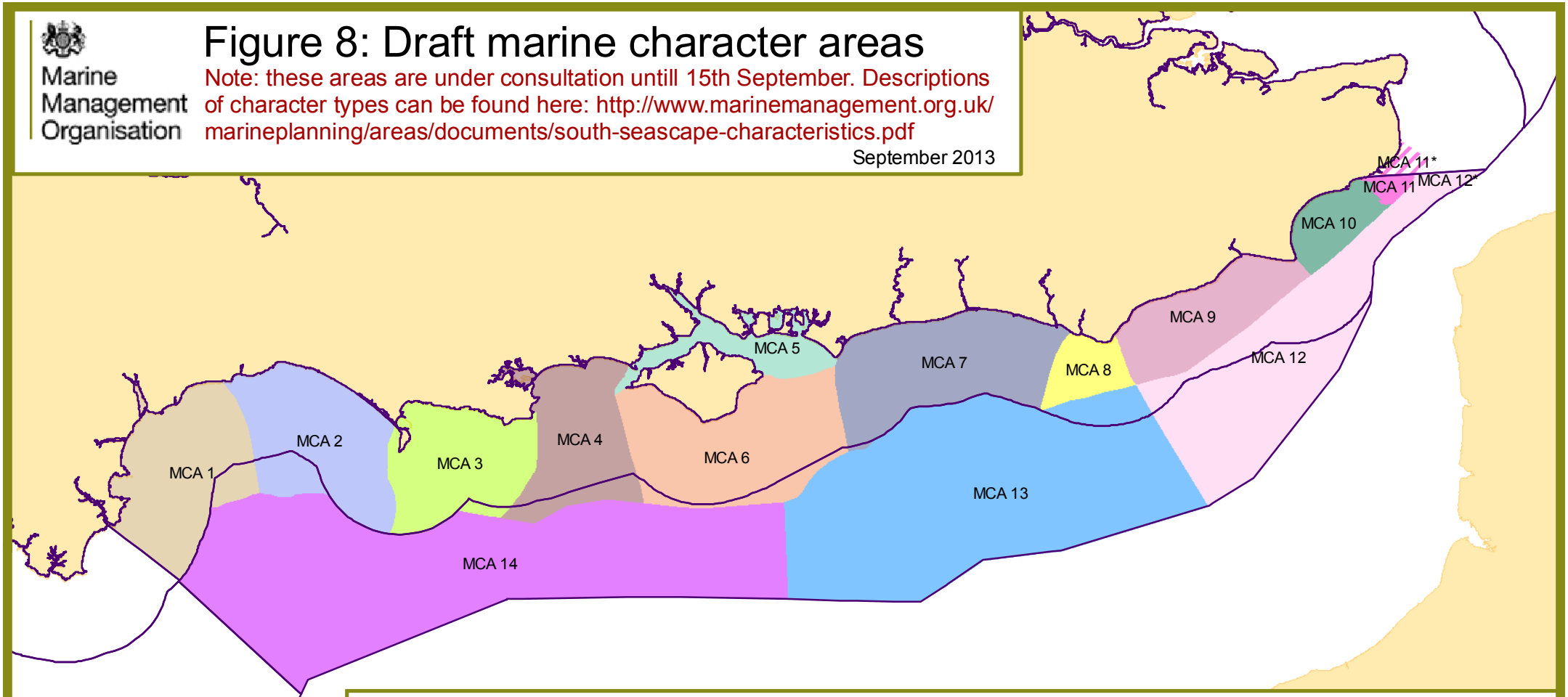

Marine plan areas

Marine character areas

- MCA 1 : Lyme Bay (West)
- MCA 2 : Lyme Bay (East)
- MCA 3 :Portland, Weymouth Bay and Lulworth Banks
- MCA 4 :Poole and Christchurch Bays
- MCA 5 :The Solent
- MCA 6 :South Wight
- MCA 7 :Selsey Bill to Seaford Head
- MCA 8 :South Downs Maritime
- MCA 9 :Eastbourne, Pevensey & Rye Bays
- MCA 10 :Dungeness, Hythe and East Wear Bays
- MCA 11 :Dover Strait Inshore Waters
- MCA 11* :Dover Strait Inshore Waters (*outside study area)
- MCA 12 :English Channel/Dover Strait
- MCA 12* :English Channel (East) / Dover Strait (*outside study area)
- MCA 13 :English Channel (Central)
- MCA 14 :English Channel (West) & the Wight-Barfleur Reef

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Figure 9: Draft visual resource mapping

Note: these areas are under consultation untill 15th September and may be subject to change.

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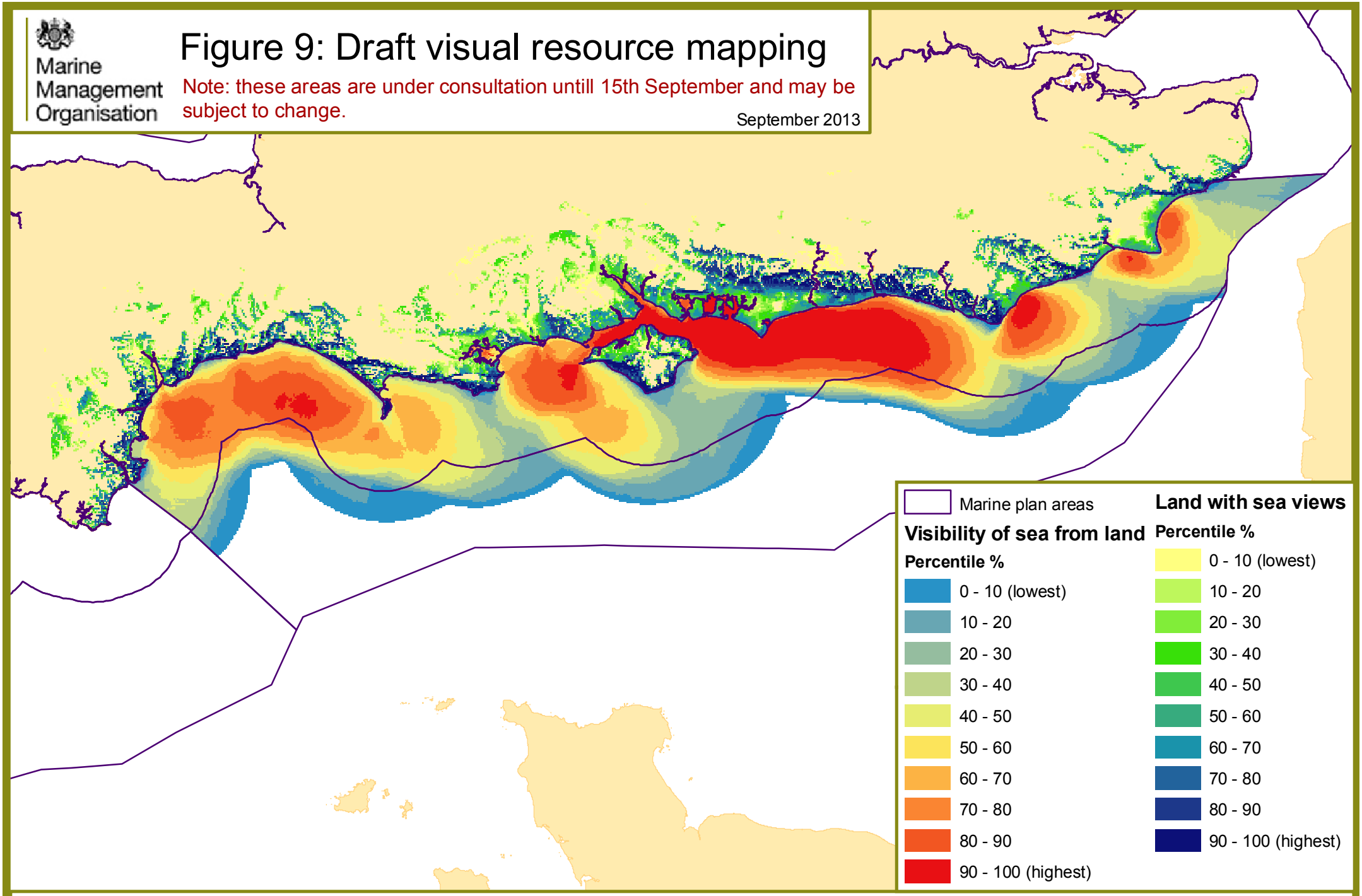


Potential key issues

- Navitus Bay and Rampion wind farm developments and cable landfall areas
- Increased tourism and recreation and the development of facilities to support it, may change character in the area. In turn, as tourism and recreation are partly dependent on seascape as a resource, changes to character (either by tourism and recreation or other marine activities) may have an adverse effect on tourism and recreation.

Interactions with other sectors

- The development of Historic Seascape Characterisation (HSC) alongside the seascape assessment process.
- Tourism and recreation hotspots have may have an effect in relation to the visual mapping work
- Pressures regarding offshore wind development
- Effects that cable landfalls may have on AONBs, National Parks, Heritage Coasts and World Heritage sites.

2.4 Defence and national security

The Ministry of Defence (MOD) has the primary role of providing military defence and security to the people of the UK and overseas territories. Within UK waters in peacetime military activities comprise basing, practice and training activities, routine patrolling, transporting equipment and personnel in and out of the country, search and rescue (SAR) operations (in conjunction with HM Coastguard) and communications including using radar[164].

Current situation

Basing

The South marine plan area includes one of the UK's main naval bases; Her Majesty's Naval Base (HMNB) Portsmouth. HMNB Portsmouth is home to almost two-thirds of the Royal Navy's surface ships, including Type 45 destroyers, Type 23 frigates, mine countermeasures and fishery protection squadrons. HMNB Portsmouth is planned to be the home to the new Queen Elizabeth class aircraft carriers from 2017. The base is a major employer with 16,000 people employed at peak times. For every 100 FTE jobs the predicted downstream spending at the naval base stimulates another 66 jobs elsewhere in the Solent Local Enterprise Partnership (LEP) area. Overall the base generates output of £1.68bn, and for every £1m generated another £750,000 of spending is stimulated in other sectors of the LEP economy[165].

HMNB Devonport is situated just outside the South marine plan areas in the South West Inshore marine plan area. HMNB Devonport is the largest naval base in western Europe and the home to Britain's amphibious ships, half her frigates and submarine fleet. Flag Officer Sea Training (FOST) the training hub of the front-line

[164] MMO (2013). Strategic Scoping Report for marine planning in England, p64
[165] University of Portsmouth (2012) Socio-Economic Impact Assessment of Portsmouth Naval Base. Prepared for The Partnership for Urban South Hampshire and Solent Local Enterprise Partnership.

Fleet of the Royal Navy is also based at Devonport. The fleet is also active in the South marine plan areas.

There is considerable interaction between the two naval bases not only in direct operations and training but also in the areas of personnel, engineering and supplies. Consideration of the interactions between South and South West marine plan areas should be undertaken as part of the marine planning process.

Training

The Royal Navy has a reputation for being a world leader in operational sea training. This seagoing training delivers operational training across all disciplines for the Royal Navy and other Navies. The Navy's training prepares all types of aircraft, surface warships, submarines and auxiliaries for all operations that are likely to be faced.

Sea training is carried out within defined military practice and exercise (PEXA) training areas. The South marine plan areas contain a number of PEXAs, the majority of which cover the area south and west of the Isle of Wight round to Start Point. PEXAs within the area are used predominantly for naval training, involving shipping and aircraft engaged in firing activities. Areas of concentrated aerial activity are primarily located over Portland and Weymouth[166]. The direct access to supporting assets, services and a highly flexible infrastructure contributes to the benefits PEXA's bring to the South marine plan areas.
The majority of these training and exercising sites are covered by MOD byelaws. Access is prohibited when such activities are taking place, typically for several weeks per year. Large submarine exercise areas are also located within the South marine plan areas, although large scale submarine activities in the South marine plan area are rare. Byelawed areas can be examined in more detail on the MOD website[167].

Operating

Defence activities include a wide range of operations in the South marine plan area; utilising both defined areas of defence interest e.g. PEXA as well as operating within the wider marine environment.

Further to the main naval base at Portsmouth and its associated activities, defence activities operate from Portsmouth, Southampton and Weymouth with submarine berthing; Lydd and Portland Bill with range and test and evaluation establishments and Poole and Lympstone with the Royal Marines.

Enduring Royal Navy operations in the area include protecting the coastline and coastal waters, including fisheries protection, to search and rescue(SAR) operations. The MOD's SAR helicopters will be withdrawn in a phased programme during the period 2015 to 2016 and replaced by a new UK wide contracted SAR helicopter service under the DfT.

[166] MMO (2013). Economic Baseline Assessment of the South coast, p30/31
[167] HM Government (2012). MOD Byelaws. Available at: www.gov.uk/ministry-of-defence-byelaws

Five ports within the South marine plan areas have licences to handle explosive material. These ports are Portland, Poole, Marchwood, Portsmouth and Folkestone[168].

Sea mounting

The main defence sea mounting centre (SMC) is Marchwood Military Port located on the western side of Southampton water.

The SMC is operated by 17 Port and Maritime Regiment Royal Logistics Corps whose role is primarily to load and discharge service or civilian shipping in support of military administration, exercises and operations worldwide. The SMC also provides a training base for army port and maritime personnel. The port is also utilised by the Royal Fleet Auxiliary.

Should the Armed Forces be required to mount a significant deployment then they will use much of the military infrastructure along the south coast. This activity is likely to focus on Marchwood Military Port and Portsmouth Naval Base but may include other ports. Decision makers should be aware of such occasional activities that may occur away from the more often used defence establishments and ensure they are not constrained.

Existing policy

The following relevant goals/objectives and policies drawn from the MPS are highlighted by way of context although it should be noted that identifying objectives and deriving planning policies are later steps in the planning process.

- Marine activities should not prejudice the interest of defence and national security and the MOD should be consulted accordingly. The participation of the MOD in the development of marine plans and their contribution to overall safety, security and resilience will ensure the effective use of marine resources while identifying mitigation measures, where possible, for incompatible activity or usage[169].
- Marine plan authorities and decision makers should take full account of the individual and cumulative effects of marine infrastructure on both marine and land based MOD interests. Marine plan authorities, decision makers and developers should consult the MOD in circumstances where defence interests may be compromised[170].

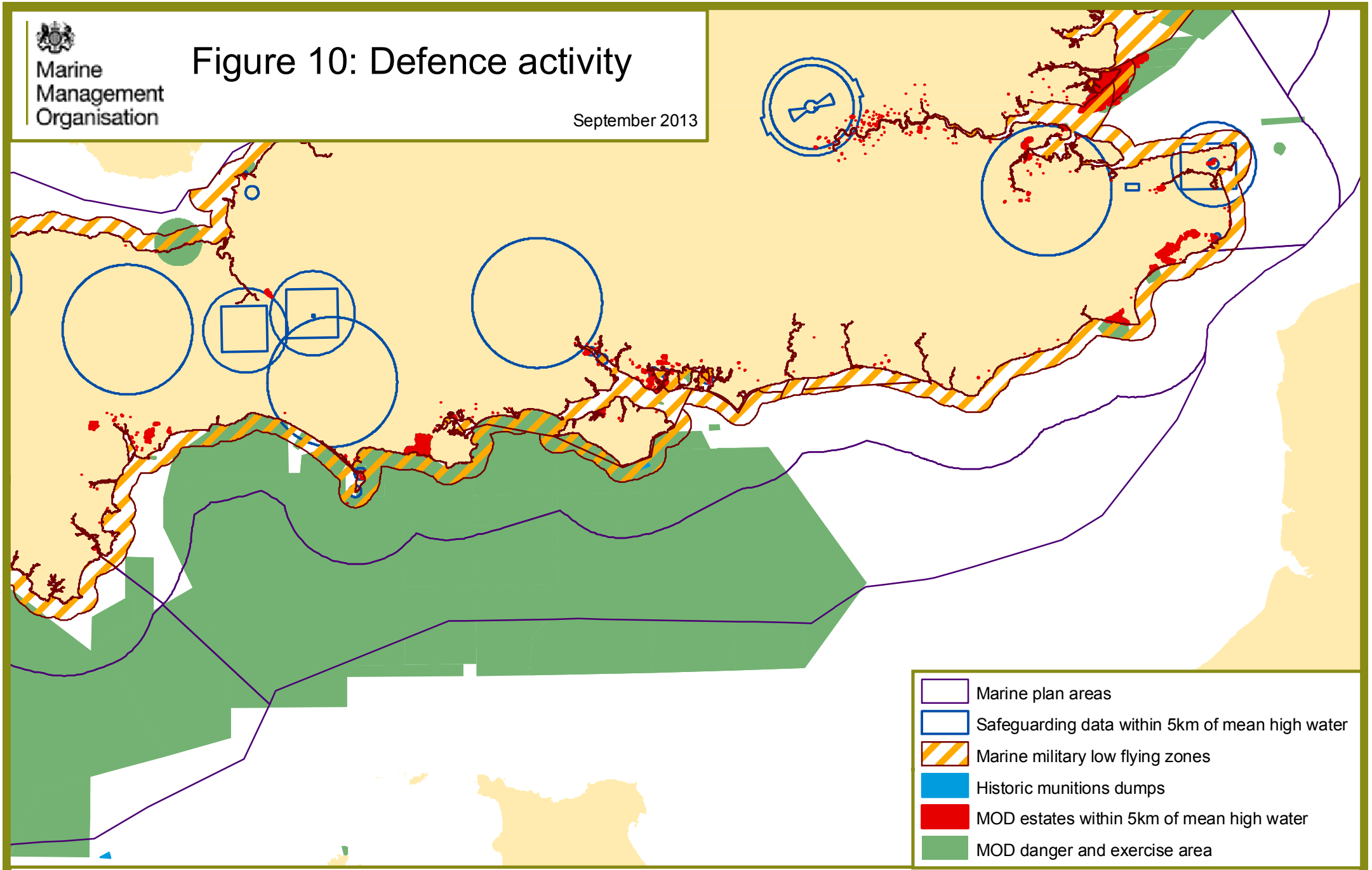
Defence activity is prevalent in the South marine plan areas although this is not recognised widely across local plan policies. More detail regarding defence activity can be found in the descriptive text within such plans and further consideration of this can be made when developing South Marine plan policies.

[168] MMO (2013). Economic Baseline Assessment of the South coast, p30/31
[169] HM Government (2011) MPS para 3.2.2 www.defra.gov.uk/publications/files/pb3654-marine-policy-statement-110316.pdf
[170] HM Government (2011) MPS para 3.2.9 www.defra.gov.uk/publications/files/pb3654-marine-policy-statement-110316.pdf

Marine Management Organisation

Figure 10: Defence activity

September 2013



Future trends

Any future changes in the nature and level of this marine activity are likely to be driven by strategic decisions at national level taken by the MOD. The marine planning process itself is unlikely to have great influence over the prevalence or location of defence-related activities[171].

The MOD's SAR helicopters will be withdrawn in a phased programme during the period 2015 to 2016 and replaced by a new UK-wide SAR helicopter contracted service under the DfT.

A Cabinet Office led, cross-government agreement has seen the formation of a National Maritime Information Centre (NMIC). The NMIC has been set up to bring together representatives of the MMO, Department for Transport, MOD, Home Office, Foreign Commonwealth Office and Department of Energy and Climate Change into one location to ensure the full range of maritime security challenges can be tackled in partnership across government. The Royal Navy's command and control infrastructure and maritime surveillance capability is of upmost importance for the NMIC[172].

Potential key issues

- It is important for decision makers to take account of appropriate locations for new developments alongside other uses of marine space
- Marine activities should not prejudice the interest of defence and national security and the MOD should be consulted accordingly[173].
- Marine plan authorities, decision makers and developers should consult the MOD in circumstances where defence interests may be compromised

Interactions with other sectors

- Potential exists for wind turbines to cause radar interference when turbine heights exceed certain levels, but how this will affect future deployment of offshore wind farms remains to be seen. Recent developments in radar technology may eliminate the need for MOD to object to wind farm projects on this basis.[174]
- Disturbance/ adverse effects on habitat and wildlife in PEXA areas, no impact is expected upon these areas.

Issues for sustainability

- Historic munition dumps – within the plan area there are a number of historic munition dumps. The location of these are publicly available, although information on the intensity of use and type and quantity of munitions disposed of is limited.

[171] MMO (2013). MMO (2013). Economic Baseline Assessment of the South coast, p30/31
[172] HM Government (2011). National Maritime Information Centre. Available online at: www.nautinstlondon.co.uk/nautinstlondon/wp-content/uploads/2012/12/NMIC-information-booklet.pdf
[173] HM Government (2011) MPS para 3.2.2 www.defra.gov.uk/publications/files/pb3654-marine-policy-statement-110316.pdf
[174] Ministry of Defence (2012) MOD paves way for new wind-farm-friendly radars, 12 January 2012, www.gov.uk/government/news/mod-paves-way-for-new-wind-farm-friendly-radars

2.5 Energy production and infrastructure development

2.5.1 Oil and Gas

Current Situation

Oil (petroleum) and gas (natural gas) extracted in the UK largely takes place in the offshore marine area from oil and gas wells. The oil is pumped initially to an oil rig and transported onshore via pipelines. Oil and gas provides the UK with a significant proportion of its primary energy demand, contributing 73% in 2011[175].

Within the South marine plan areas there is currently no active oil and gas extraction activity offshore. However within close proximity to the marine area there are land based oil extraction located in Wareham, Kimmeridge and Wytch Farm. Wytch Farm, recently taken over by Perenco from British Petroleum (BP), is the largest onshore field in Western Europe with the production of over 500 million tonnes (Mt) of crude oil per annum. A small part of Wytch farm extends into the offshore area in Poole Bay, Dorset, although drilling operations are entirely land-based. [176] Wytch Farm currently has the world's longest well trajectory of 10.1km under Poole Bay (Dorset Coast Forum, no date).

Existing policy

The key government drivers for the oil and gas industry are the push for the UK to have a competitive and secure energy market and to move towards a low carbon economy. Legislation and policy includes:

- Climate Change Act (2008)
- Energy Act (2011)
- Petroleum Act (1998)
- UK Marine Policy Statement (2011)
- Climate Change Committee advice (2011)
- Carbon Budgets[177]
- Energy White Paper (2003) - Our energy future - creating a low carbon economy

As reserves throughout the UK are mature, the UK is becoming increasingly dependent on imported energy, which is anticipated to supply about half of the UK's total annual gas demand by 2020.

Value of the activity

As there are currently no offshore based oil and gas extraction sites within the South marine plan areas no economic assessment has been completed. However associated secondary support activities exist, such the ESSO (Exxon Mobil) refinery at Fawley, near Southampton, which is the largest in the UK. Situated on Southampton water it has a mile-long marine terminal that handles around 2,000

[175] www.oilandgasuk.co.uk/cmsfiles/modules/publications/pdfs/EC030.pdf
[176] MMO,2013. Economic Baseline Assessment of the South Coast
[177] www.gov.uk/government/policies/reducing-the-uk-s-greenhouse-gas-emissions-by-80-by-2050

ship movements and 22 Mt of crude oil per annum.[178] Fawley Oil Refinery plays a key community role for the area providing 2,300 onsite jobs.[179] In addition there are three onshore based oil and gas extraction sites located at Wareham, Kimmeridge and Wytch Farm. Wytch Farm is the largest of the three sites and is regarded as the largest onshore oilfield in Western Europe, producing approximately 500 million tonnes of crude oil annually.[180] A small part of Wytch farm extends into the offshore area in Poole Bay, Dorset, although drilling operations are entirely land-based. The site currently employs 100 staff and 250 contractors.[181] Wytch Farm has an estimated GVA of £266 million.[182]

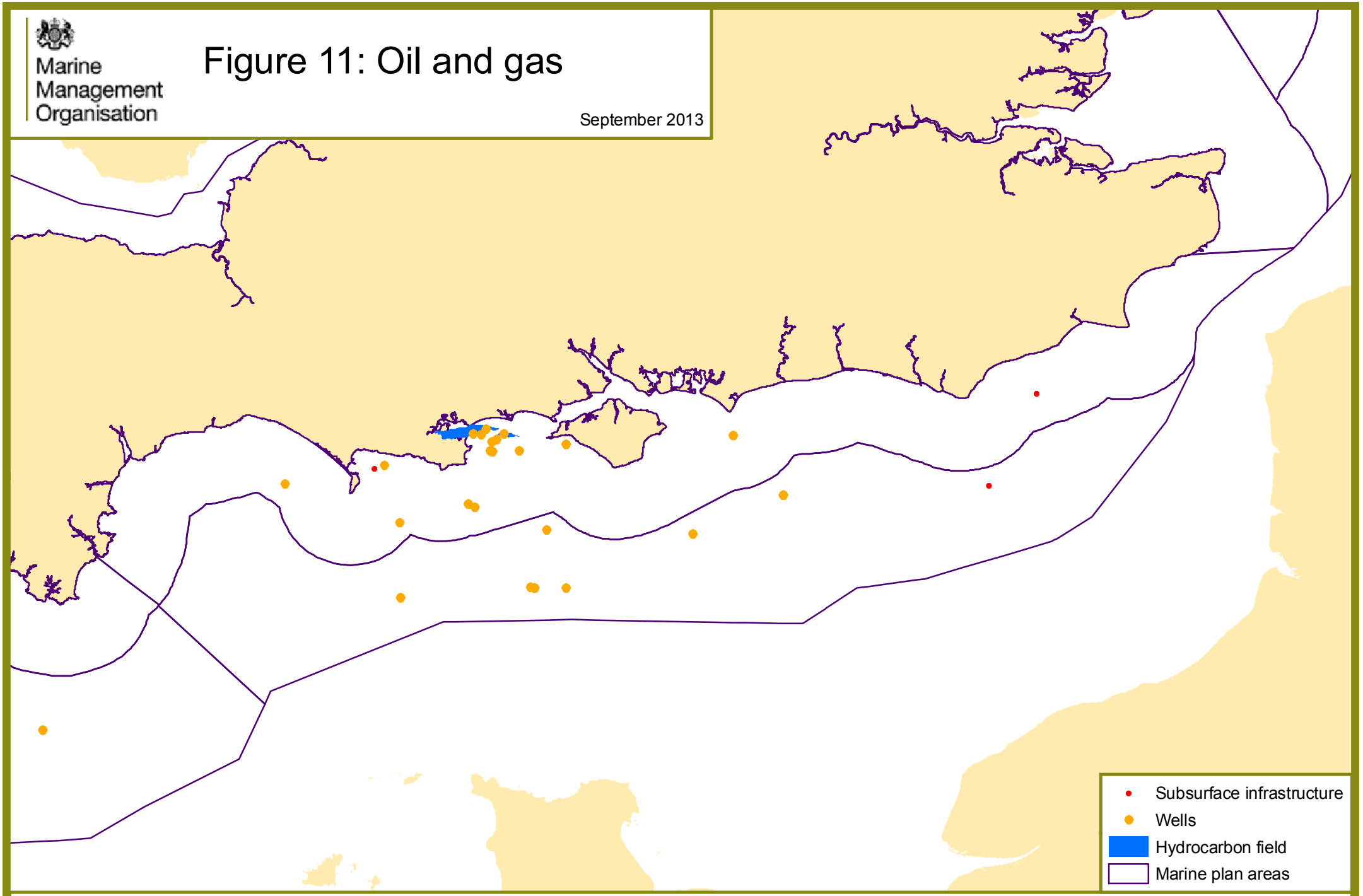
The majority of oil and gas-related activity is located within the centre of the South marine plan areas. It is concentrated in the areas from Bridport in the west to Selsey Bill in the east, particularly in the vicinity of the Isle of Wight and Poole, with the exception of one subsurface installation pipe offshore from Eastbourne that is now classed as 'debris', although still with an 'active' status. See Figure 11 showing activity areas:

[178] http://www.exxonmobil.com/UK-English/about_what_refining_fawley.aspx
[179] http://www.exxonmobil.co.uk/UK-English/files/Fawley_2011.pdf
[180] www.gov.uk/oil-and-gas-uk-field-data
[181] www.perenco-uk.com/about-us/wytch-farm.html
[182] www.gov.uk/oil-and-gas-uk-field-data

Marine Management Organisation

Figure 11: Oil and gas

September 2013



Future trends

There is unlikely to be any significant production activity in the South marine plan areas in the short-term as there is currently no offshore extraction taking place.[183] The 26th oil and gas licensing round (2010) saw NP Solent (a subsidiary of Northern Petroleum Plc), NWE Mirrabooka (Northwestern Energy) and Infrastrata gain licences to commence drilling activities in nine different blocks off the coast of the Isle of Wight and in the Wessex Basin. The aforementioned companies are yet to begin exploratory activities, although Infrastrata has announced plans to drill its first exploration well in 2013.[184]

It is therefore forecasted that any drilling activity leading to production is unlikely to commence within the next six years. Depending on the findings of the initial exploration work, it is possible that offshore development for production could occur within the next 20 years.[185] A small proportion of the oil and gas production licences awarded in the licensing round may develop into extraction sites. Therefore it is not guaranteed that the licences identified above will develop into production sites.

Historic trends

Oil refining has taken place at Fawley since 1921 and the oil terminal at Hamble has been operational, at a small scale, since 1924. Both pre-date the discovery of oil in the area, though Hamble is now responsible for the export of oil produced at Wytch Farm.

In 1965 BP drilled the first offshore UK well in the south coast region in Lulworth Banks, although this was exploratory and was never developed. Production has grown incrementally since then and after the extent of the offshore oilfields at Wytch Farm was confirmed in 1988, BP commenced Extended Reach Drilling (ERD) techniques in the region in 1993.

Potential key issues

- There are currently no issues for the oil and gas sector within the South marine plan areas, but should large oil or gas deposits be found these would be expected to be extracted, in line with current government policy.

2.5.2 Offshore Wind

Offshore wind energy production is set to play a crucial role in achieving renewable energy production and carbon dioxide emission reduction targets by 2020 and beyond. There are a large number of wind farms in the planning phase and gaining consents as well as a growing number that are operational around English waters. Offshore wind technology is the most established renewable energy technology in English waters with 3.8GW of capacity in operation or under construction and a further 32GW in the development pipeline[186]. This represents the largest deployment of offshore wind farms in the world.

[183] MMO, 2013. South Marine Plan Futures Analysis
[184] www.infrastrata.co.uk/index.php?option=com_content&task=view&id=270&Itemid=105
[185] MMO, 2013. South Marine Plan Futures Analysis
[186] Figures from UK Wind Energy Database (accessed 15/04/2013), Available online: www.renewableuk.com/en/renewable-energy/wind-energy/uk-wind-energy-database/index.cfm and The Crown Estate website(accessed 15/04/2013), available online:

Current situation

There are currently no wind farms in construction or operation in the South marine plan areas but The Crown Estate's leasing programme has identified two Round 3 zones[187] from which developers can bring projects forward. These are Navitus Bay (off Dorset and Hampshire coast) and Rampion (off the coast of Brighton).

Rampion[188]

- The project is being developed by E.ON
- The application is for an installed capacity of 700MW with a range of options from 100, 7MW turbines to a maximum of 175 turbines of at least 3MW generating capacity each
- The wind farm is sited 13km to 23km of the Sussex coast
- The export cable is proposed be buried for 26.4km to a national grid substation 2km south-west of Bolney
- The project will create an estimated 65-85 permanent jobs
- Newhaven port has been identified as the base for operations and maintenance if the application is granted
- The proposal has been submitted to the Planning Inspectorates National Infrastructure Division in March 2013 with a decision on consent for the project expected in summer 2014[189].

Navitus Bay[190]

- The project is a joint venture between Eneco Wind UK Ltd and EDF Energy
- The developers are aiming for an installed capacity of 1100MW from a range of options from 136, 8MW turbines to 218, 5MW turbines
- The proposed wind farm is 13.9km offshore at its closest point to land (the Needles)
- The developer estimates that up to 1,000 jobs will be created during the construction phase of the project with 100 permanent jobs created for the operational life of the wind farm
- The export cable is proposed to land at Taddiford Gap, between Barton-on-Sea and Milford-on-Sea and run 35km underground to a substation close to West Moors and Three Legged Cross
- The project application is expected to be submitted to the Planning Inspectorates National Infrastructure Division in quarter 1 of 2014[191]

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www.thecrownestate.co.uk/energy-infrastructure/offshore-wind-energy/our-portfolio/

[187] The Crown Estate website (accessed 05/09/2013), Our portfolio: Round 3 windfarms, available online: www.thecrownestate.co.uk/energy-infrastructure/offshore-wind-energy/our-portfolio/round-3-wind-farms/

[188] E.ON UK (2013), Rampion Exhibition Boards: Welcome to the Rampion Offshore Wind Farm project update. Accessed August 2013, www.eon-uk.com/downloads/1304_Rampion_Exhibition_Boards_(Final)_pdf.pdf

[189] National Infrastructure Planning website (accessed 05/09/2013), Rampion Offshore Wind Farm, available online: http://infrastructure.planningportal.gov.uk/projects/south-east/rampion-offshore-wind-farm/

[190] Navitus Bay, Website (Accessed 11/07/2013), Available online: http://navitusbay.production.lablateral.com/project.aspx

[191] National Infrastructure Planning, Website (Accessed 12/07/2013), Available online: http://infrastructure.planningportal.gov.uk/projects/south-east/navitus-bay-wind-park-formerly-isle-of-wight/

Current policy

Climate change act[192]

- The Climate Change Act 2008 and subsequent order revising the 2020 carbon budget[193] has committed the UK Government to reduction of greenhouse gas emissions by 80% on 1990 levels by 2050, with an interim target of 34% by 2020.

Renewable Energy Directive[194]

In terms of renewable energy, the UK has a legally binding target to generate 15% of its energy from renewable sources by 2020, stemming from the EU Renewable Energy Directive

- .

Renewable Energy Roadmap[195]

- This document forms a 'delivery roadmap' to achieve the Renewable Energy Directive's targets to 2020.
- Analysis conducted as part of this report estimated the potential for growth in offshore wind generation to 2020 a central range estimate of up to 18 GW.

Electricity Market Reform[196]

- The Electricity Market Reform aims to replace the current renewable obligation scheme in order to deliver the Government's three energy policy objectives – to ensure energy security, to keep energy bills affordable, and to de-carbonise energy generation.
- The main mechanism for achieving these targets are Contracts for Difference (CfD), which will provide long-term support for all forms of low-carbon generation by removing these sources of generation from wholesale electricity prices providing a long-term and stable income for renewable energy generators.

National Policy Statements

- The Department of Energy and Climate Change (DECC) has produced a number of national policy documents for energy infrastructure which set out national policy as to how applications should be considered. The documents relevant to offshore wind are the overarching document (EN-1) and the renewable energy document (EN-3).

[192] HM Government (2008), Climate Change Act, Available online: www.legislation.gov.uk/ukpga/2008/27/contents

[193] HM Government (2009), S.I. 2009/1258 art. 2 (2), Available online: www.legislation.gov.uk/uksi/2009/1258/contents/made

[194] European Commission (2009), DIRECTIVE 2009/28/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL: on the promotion of the use of energy from renewable sources and amending and subsequently repealing Directives 2001/77/EC and 2003/30/EC, Available online: http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=Oj:L:2009:140:0016:0062:en:PDF

[195] Department of Energy and Climate Change (2012), UK Renewable Energy Roadmap Update 2012, Available online: www.gov.uk/government/uploads/system/uploads/attachment_data/file/80246/11-02-13_UK_Renewable_Energy_Roadmap_Update_FINAL_DRAFT.pdf

[196] HM Government website (Accessed 12/07/2013), Electricity Market Reform: Delivering UK Investment, Available online: www.gov.uk/government/publications/electricity-market-reform-delivering-uk-investment

Sub-national policy

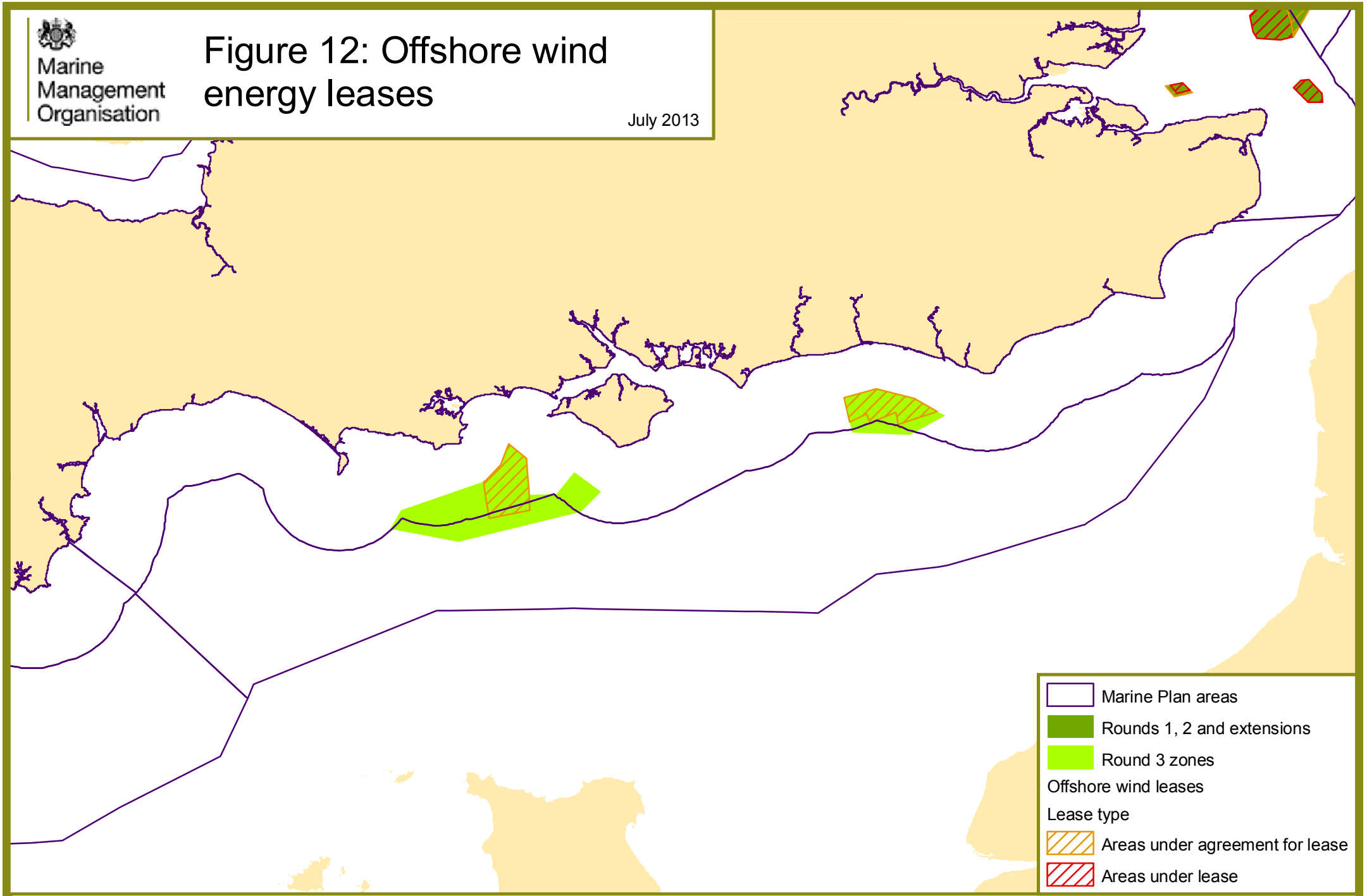
Numerous sub-national policy documents offer differing levels of support for renewable energy:

- Lewes District Support has a policy to support the delivery of onshore infrastructure and support services for the Rampion offshore wind farm at Newhaven port.
- New Forest District Core Strategy provides a level of support by retaining suitable sites to accommodate marine industries and site with direct access to the coast for marine related businesses.
- The Eastleigh Borough Local Plan states it will permit development of zero or low carbon energy generation infrastructure.
- A number of sub-national plans present a general support for renewable energy as long as social, economic and environmental considerations are taken into account. These include Test Borough Local Plan, Purbeck's Local Plan, Arun Draft Local Plan, Dorset Area of Outstanding Natural Beauty (AONB) and the East Devon AONB delivery plans.
- Visual resource and wider environmental considerations alongside the development of renewable energy have been highlighted in policies in plans from Chichester Harbour AONB, Purbeck's Local Plan, Isle of Wight AONB and West Dorset District.

Marine Management Organisation

Figure 12: Offshore wind energy leases

July 2013



Future trends

The development of the two Round 3 zones in the South marine plan areas if consented, have potential to impact upon the area and other activities throughout their construction and operation. Most of these impacts will be assessed as part of project level assessments however some of the indirect or more strategic impacts may be managed through the South marine plans and application of their specific policies in decision making.

Rampion aim to begin construction by 2015 and complete the project in 2018/19[197]. It is estimated that the total capital value of the project, including offshore and onshore elements, would be in the order of £2 billion. However, it is challenging to pinpoint how much may be secured in the region or locally.[198]

Navitus Bay is planning to start construction in 2017 with the project fully operational in 2020. No assessment of supply chain has been completed at this point but precedents set by other wind farms indicate a significant number of local jobs in the supply chain may occur as a result of the wind farms construction.

Potential key issues

- Gaining investment in projects and the potential effects of CfD and uncertainty on how this will affect the development pipeline[199].
- Consenting risk being highlighted as a big issue for developers due to the front loading of work in the consenting process.
- The potential cumulative effects of construction in the South marina plan area with navigation, visual impact, birds and marine noise are of particular concern at the strategic level (Note that these are assessed and mitigated in project level environmental impact assessments (EIA) and subsequent environmental statements).

Interactions with other sectors

- Navigation – Wind farms present an obstacle to both recreational and commercial shipping with vessels being diverted around the development
- Visual resource – needs careful management to avoid sensitive receptors
- Fishing – Displacement of certain types of fishing activity from both within the wind farms and cable corridors

[197] E.ON UK (2013), Rampion Exhibition Boards: Welcome to the Rampion Offshore Wind Farm project update. Accessed August 2013, www.eon-uk.com/downloads/1304_Rampion_Exhibition_Boards_(Final)_pdf(1).pdf

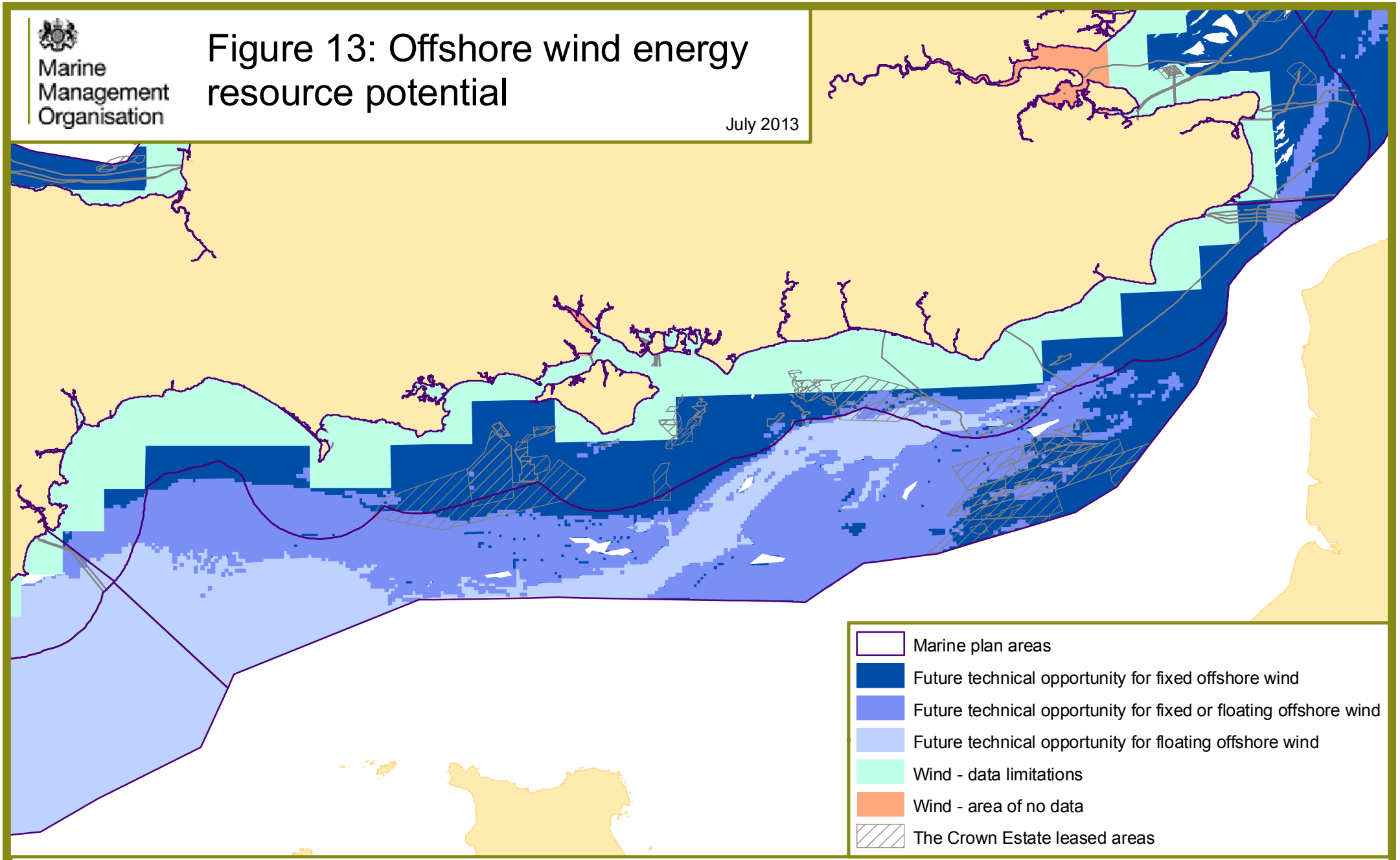
[198] As footnote 194.

[199] Marine Management Organisation (2013), MMO Project No 1039: South marine plan areas futures analysis, Available online: www.marinemanagement.org.uk/evidence/documents/1039.pdf

Marine Management Organisation

Figure 13: Offshore wind energy resource potential

July 2013



Note: The areas of future technical opportunity do not include the presence of hard constraints posed by existing uses of the marine estate or other factors including natural & cultural resources, marine users, economics & market appetite and policy drivers required for the opportunity to be supported. Cables and pipelines outside of the Territorial Waters Limit (other than export cables) are not shown as they are not subject to The Crown Estate's permission

2.5.3 Tidal stream devices

Significant development of wave and tidal energy devices has occurred in recent times with a number of devices being deployed at test sites around the UK. It is estimated that the wave and tidal industry could be worth up to £6.1 billion and could provide up to 20,000 jobs by 2035[200].

Resource mapping completed by The Crown Estate[201] shows that harvestable wave energy is not feasible using current technology in the South marine plan areas. Harvestable tidal stream resources exist in the South marine plan areas focused around the Isle of Wight and Portland Bill.

Current situation

Perpetuus Tidal Energy Centre (also known as the Solent Ocean Energy Centre)[202]

- The site is currently being developed by the Isle of Wight Council.
- The centre aims to develop a managed test and demonstration facility for tidal energy developers. This site is targeting deployment of full scale single units and small arrays, from prototype to pre-commercial stages of development.
- The site was awarded an agreement for lease from The Crown Estate in November 2012 and is situated to the south of the Isle of Wight.
- The developers have already commissioned a scoping report with a full EIA process expected to be completed by 2014.
- If consented, construction is planned to commence in 2015 over a period of approximately 12 months.
- Activities at the site will include the installation, testing and decommissioning of tidal devices, as well as operation and assessment of maintenance methods and operational issues.
- The devices will be grid connected with individual test devices connecting into an offshore hub for export of electricity ashore.

The Crown Estate's wave and tidal leasing program[203]

- The Crown Estate performed an industry engagement exercise with wave and tidal stakeholders to establish how best to encourage and accelerate wave and tidal stream technology development.
- The outcome of this exercise was to lease more demonstration zones with the option of third party management of zones – specifically not the technology

[200] Renewable UK (2013), Wave and Tidal Energy in the UK: Conquering Challenges, Generating Growth, Available online: www.renewableuk.com/en/publications/index.cfm/wave-and-tidal-energy-in-the-uk-2013
[201] The Crown Estate (2012), UK Wave and Tidal Key Resource Areas Project, Available online: www.thecrownestate.co.uk/media/355255/uk-wave-and-tidal-key-resource-areas-project.pdf
[202] MMO, Website (Accessed 09/07/2013), Marine Case Management System - Public Register, Available online: https://marinelicensing.marinemanagement.org.uk/mmo/fox/live/MMO_PUBLIC_REGISTER/
[203][203] The Crown Estate, Website (Accessed 10/07/2013), Wave and Tidal- Further Leasing , Available online: www.thecrownestate.co.uk/energy-infrastructure/wave-and-tidal/working-with-us/further-leasing/

owner. This is a similar arrangement to that of FabTest in the South West Inshore plan area.

- The Crown Estate intend to award seabed rights as early as March 2014.

Current policy

Climate change act[204]

- The Climate Change Act 2008 and subsequent order revising the 2020 carbon budget[205] has committed the UK Government to reduction of greenhouse gas emissions by 80% on 1990 levels by 2050, with an interim target of 34% by 2020.
- Tidal energy is unlikely to contribute significantly to the 2020 targets however supporting development of testing facilities will be essential to ensure this technology can contribute to longer term targets.

Renewable Energy Directive[206]

- In terms of renewable energy, the UK has a legally binding target to generate 15% of its energy from renewable sources by 2020, stemming from the EU Renewable Energy Directive.

Renewable Energy Roadmap (Update 2012)[207]

- The document forms a 'delivery roadmap' to achieve the Renewable Energy Directive's targets to 2020 and discusses the potential for wave and tidal energy to do this.
- The document states that in order to capitalise on current progress in the development of tidal devices, the industry needs to progress to deploying commercial scale arrays. Sites such as Perpetuus Energy Centre will enable appropriate facilities to test devices at array scales and will aid the continued development of devices up to commercial scale.

Sub-national policy

- Numerous sub-national policy documents offer differing levels of support for renewable energy:
  - New Forest District Core Strategy provides a level of support by retaining suitable employments sites with direct access to the coast for marine-related businesses.
  - The Eastleigh Borough Local Plan states development of zero or low carbon energy generation infrastructure will be permitted potentially allowing cable landing locations for offshore tidal developments.

[204] HM Government (2008), Climate Change Act, Available online: www.legislation.gov.uk/ukpga/2008/27/contents

[205] HM Government (2009), S.I. 2009/1258 art. 2 (2), Available online: www.legislation.gov.uk/uksi/2009/1258/contents/made

[206] European Commission (2009), Directive 2009/28/of the European Parliament and of the Council: on the promotion of the use of energy from renewable sources and amending and subsequently repealing Directives 2001/77/EC and 2003/30/EC, Available online: http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=Oj:L:2009:140:0016:0062:en:PDF

[207][207] Department of Energy and Climate Change (2012), UK Renewable Energy Roadmap Update 2012, Available online: www.gov.uk/government/uploads/system/uploads/attachment_data/file/80246/11-02-13_UK_Renewable_Energy_Roadmap_Update_FINAL_DRAFT.pdf

- A number of sub-national plans present a general support for renewable energy as long as social, economic and environmental considerations are taken into account. These include Test Borough Local Plan, Purbeck's Local Plan, Arun Draft Local Plan, Dorset AONB and the East Devon AONB delivery plans.
- The need to balance visual resource and wider environmental considerations alongside the development of renewable energy has been highlighted in policies in plans from Chichester Harbour AONB, Purbeck's Local Plan, Isle of Wight AONB and West Dorset District Council.

- Adjacent to the South marine plan areas is the RegenSW Marine Energy Park. This is initiative aims to allow collaboration between local and national government, local enterprise partnerships, technology developers, academia and industry. This may benefit the development of a tidal energy industry in the South marine plan areas in the long run as companies and researchers locate to the area and sites are developed.

Future trends

The Crown Estate's wave and tidal demonstration leasing round and key resource areas study indicates that there is significant potential for developing tidal stream devices around the Isle of Wight and off Portland Bill. It is unclear when commercial arrays and larger scale tidal developments might be brought forward.

Potential key issues

- The tidal industry needs to start developing commercial scale arrays to ensure the progress made in this sector continues. Space should be left to ensure this activity can happen in the most cost effective areas to ensure the continued development of the industry.
- Demonstration and test sites offer a valuable stepping stone to achieving this goal where devices can be tested in a live environment. The Crown Estate is in the process of leasing more of these sites in the South marine plan area and development within them should be encouraged.
- Tidal resource is relatively limited and needs protection from other marine construction and activities to ensure the potential resource is not protected as far as feasibly possible.
- Installation of tidal arrays and devices could potentially displace:
- fishing activity
- recreation boating
- shipping activity
- Offshore wind and tidal stream devices have the potential to conflict in the South marine plan areas due to Navitus Bay wind farm site being situated in an area of potential tidal stream resource that could theoretically be developed in the future. Potential for co-location of wind and tidal devices could be considered.

Issues for sustainability

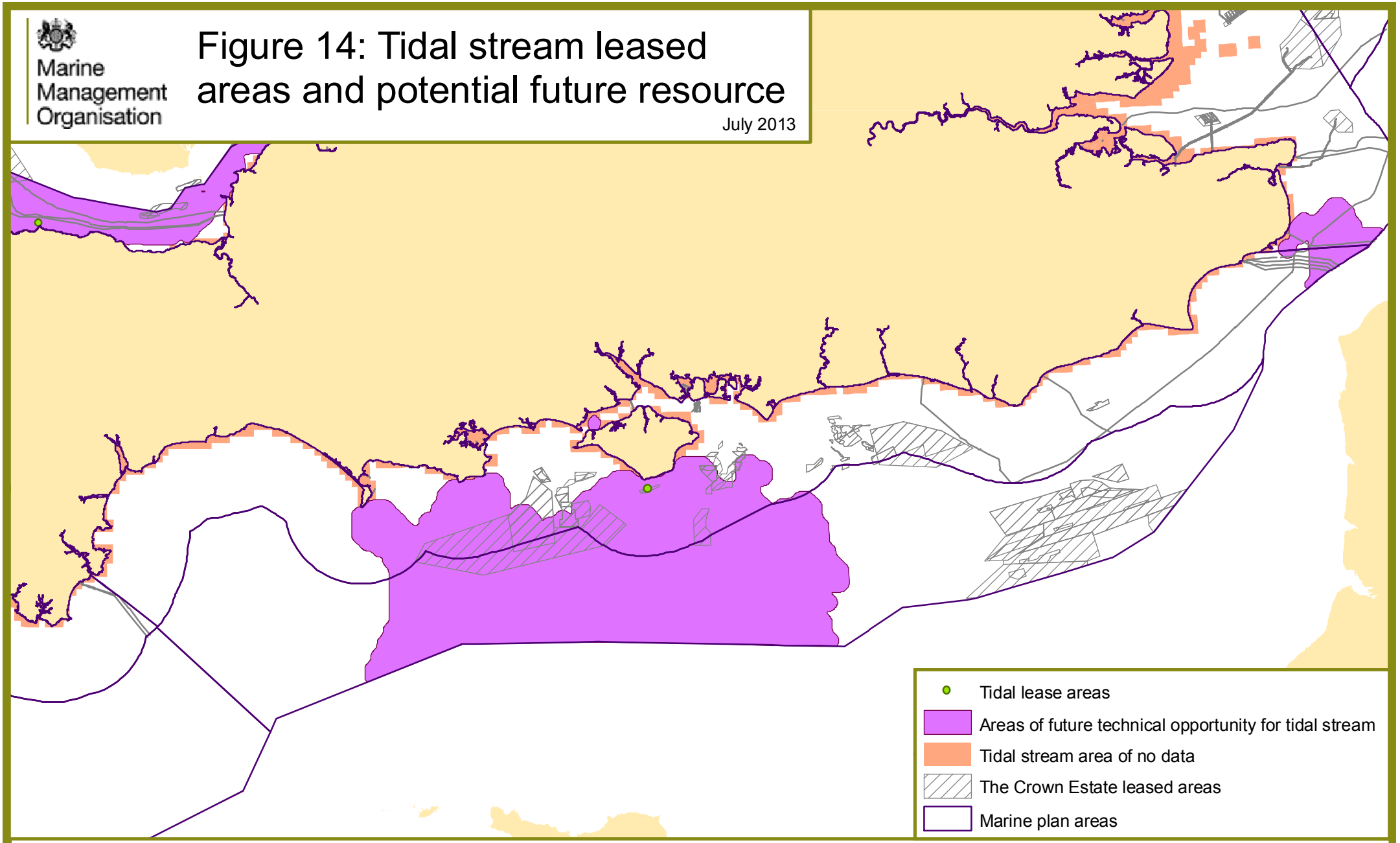
The development of a supply chain and tidal stream devices in the South marine plan areas offers a large potential for economic growth in coastal communities along the south coast.

The cumulative effects of construction in the South marine plan area with wake effects and associated disruption of coastal processes, effects on birds (especially diving birds), collision risk, scour and marine noise from pilling activities are a potential concern.

Marine Management Organisation

Figure 14: Tidal stream leased areas and potential future resource

July 2013



Note: The areas of future technical opportunity do not include the presence of hard constraints posed by existing uses of the marine estate or other factors including natural & cultural resources, marine users, economics & market appetite and policy drivers required for the opportunity to be supported. Cables and pipelines outside of the Territorial Waters Limit (other than export cables) are not shown as they are not subject to The Crown Estate's permission

2.5.4 Carbon capture and storage

Carbon capture and storage (CCS) is a developing technology that could contribute to the reduction of carbon dioxide (CO_2) being released into the atmosphere, such as when fossil fuels are burned within large-scale power stations. The CO_2 would be separated at its source and transported by associated infrastructure and pipelines, injected and stored in applicable geological formations. In the case of the offshore area, saline aquifers and depleted oil and gas fields would be used.

Current situation

There are currently no large-scale commercial CCS projects proposed or in development within the South marine plan areas. In 2008, the Portland Gas Storage Project (PGSP) was granted planning permission for a 1,000 million cubic metre gas storage facility and associated infrastructure where CO_2 would be stored in saline aquifers beneath Portland. In 2012 PGSP applied to the Department of Energy and Climate Change (DECC) for funding as part of the CCS commercialisation programme[208] where £1 billion of funding has been made available for the developments of CCS technologies. The PGSP project was unsuccessful in its application for funding.

Infrastrata, the developer behind PGSP, has stated that due to the current poor market conditions and the lack of investment in the project, the development is unlikely to proceed in the short term[209]. This does identify that the South marine plan areas have potential for CO_2 storage and is additionally highlighted with the identification of saline aquifers located off St. Alban's Head in Dorset which have the potential to store over 500 million tonnes of CO_2[210]. To illustrate the size of this resource, in 2011 the UK produced net CO_2 emissions of approximately 458.6 million tonnes (Mt).

Current policy

For the CCS sector the principal drivers come through the implementation of the following international, European and UK legislation and policies:

- Kyoto Protocol
- Energy Act 2008
- Climate Change Act 2008
- Carbon Storage Directive (Directive 2009/31/EC)
- UK Marine Policy Statement
- CCS Roadmap (2012)
- Energy White Paper (2003) – Our energy future – creating a low carbon economy
- Carbon Plan (2011)
- UK CCS Roadmap (2012)

[208] www.gov.uk/uk-carbon-capture-and-storage-government-funding-and-support
[209] www.infrastrata.co.uk/index.php?option=com_content&task=view&id=261&Itemid=137
[210] www.gov.uk/government/uploads/system/uploads/attachment_data/file/48317/4899-the-ccs-roadmap.pdf

Value of the activity

CCS has the potential to play a role in the move to a low-carbon economy, alongside renewables and nuclear power. CCS technologies could help the development of the power and industrial sectors, maintaining associated jobs and contributions to the local community. CCS is predicted to create 100,000 jobs across the UK by 2030, contributing £6.5 billion to the UK's economy[211].

The lack of any current CCS projects in the South marine plan areas means that it is not currently possible to quantify the economic impacts associated with CCS. This does not mean that there is no economic activity in the South marine plan area, just that research and exploration activity cannot be quantified[212].

As CCS is an emerging industry not just within the UK but globally, current and future trends are difficult to forecast. CCS, and its commercial viability, has yet to be established and the technology remains as yet untested. Despite suffering setbacks, the industry in terms of financing, it remains the target to have one operational CCS facility in the UK by 2020.

The UK's CCS Roadmap[213] currently predicts that for the UK there will be groups of power and industrial plants, supported and linked by associated infrastructure where CO_2 is stored at sites offshore. Within the South marine plan areas there are no such viable sites at this time. The ExxonMobil oil refinery at Fawley is currently the only large-scale emitter of CO_2 within the plan area. While the roadmap suggests that the CCS process at this site would be economically viable, with a 'source to sink' cost of under £10 a tonne, the storage of CO_2 in saline aquifers is currently less well understood than for oil and gas fields.

The current uncertainty over CO_2 storage within saline aquifers, and the considerable initial investment from industry to link the Fawley refinery site with the saline aquifers situated off St Alban's Head and/or Portland, suggest that it is unlikely that there will be CCS technologies operating within the South marine plan areas within the next 20 years[214],

Potential key issues

- With stricter emerging targets on CO_2 emissions, investment from the government as well as recommendations from the CCS Cost Reduction Taskforce[215], CCS research and development are important to drive down costs and may mean that could become CCS economically competitive and viable within the plan areas over the next 20 years.

[211] MMO, 2013. South Marine Plan Futures Analysis.
[212] MMO, 2013. Economic Baseline Assessment of the South Coast.
[213] www.gov.uk/government/uploads/system/uploads/attachment_data/file/48317/4899-the-ccs-roadmap.pdf
[214] MMO, 2013.South Marine Plan Futures Analysis.
[215] www.gov.uk/government/policy-advisory-groups/ccs-cost-reduction-task-force

2.5.5 Nuclear

Nuclear energy has been produced in England since the 1950s and delivered from 6 stations around its coastline. These sites run off two different types of reactors. Sizewell B is the only site in England which generates electricity from a pressurised water reactor (PWR), while Dungeness B, Hartlepool, Hinkley Point B, Heysham 1 and Heysham 2 all use advanced gas cooled (AGC) reactors.

It is estimated the around 16 percent of electricity produced in the UK is delivered through nuclear energy. A predictable base load of electricity has been generated by each nuclear site over the years[216].

Current situation

Six nuclear sites are currently generating electricity around the English coastline. Table 5[217] displays information regarding their outputs and lifetime expectancies.

Table 5 Nuclear capacity

AGC – British Energy	Capacity (MW)	Number of operating reactors	Published lifetime
Dungeness B	1, 110	2	1985-2018
Hartlepool	1, 190	2	1989-2019
Heysham 1	1, 160	2	1989-2019
Heysham 2	1, 250	2	1989-2023
Hinkley Point B	1, 220	2	1976-2023
PWR – British Energy	**Capacity (MW)**	**Number of operating reactors**	**Published lifetime**
Sizewell B	1, 188	1	1995-2035

More specifically in the South marine plan areas the only site which remains to generate electricity is Dungeness B. This site is owned by EDF Energy and located on Romney Marsh, Kent, with the two AGC reactors providing a combined capacity of 1, 110 MW[218]. The site has the capability to generate enough electricity to supply over 1.5 million homes. Through its location on Romney Marsh a constant supply of cooling water can also be sourced from seawater in the area[219].

The nuclear sector continues to make a major contribution to both the national and local economy, something which will continue as decommissioning projects begin to

[216] The East Inshore and East Offshore Marine Plan Areas Evidence and Issues Report, Chapter 4, 4.3.4 Nuclear Power www.marinemanagement.org.uk/marineplanning/areas/documents/east_evidence_issues_chapter4.pdf

[217] Department of Energy and Climate Change, Maintaining UK Energy Security, Table of past and present UK nuclear reactors www.gov.uk/government/publications/table-of-past-and-present-uk-nuclear-reactors

[218] Department of Energy and Climate Change, Maintaining UK Energy Security, Table of past and present UK nuclear reactors www.gov.uk/government/publications/table-of-past-and-present-uk-nuclear-reactors

[219] Draft South Marine Plan Futures Analysis 2013 para 8.2.1

take place. Dungeness B supported 554 jobs in 2012 and contributed £29 million to the local economy[220].

In order to ensure a balance is maintained in protecting the marine environment and achieving sustainable socio-economic benefits, milestones and outputs have been designed in order to make sure the following policies and targets are met.

- The UK must meet a legally binding EU target for 15% of energy consumption to come from renewable sources by 2020[221].
- The UK Government is committed to reaching its legally-binding target of an 80% reduction in greenhouse gas emissions by 2050, compared to 1990 levels[222].
- The government aims to have 16 GW of new nuclear capacity on line by 2030[223].

Current policy

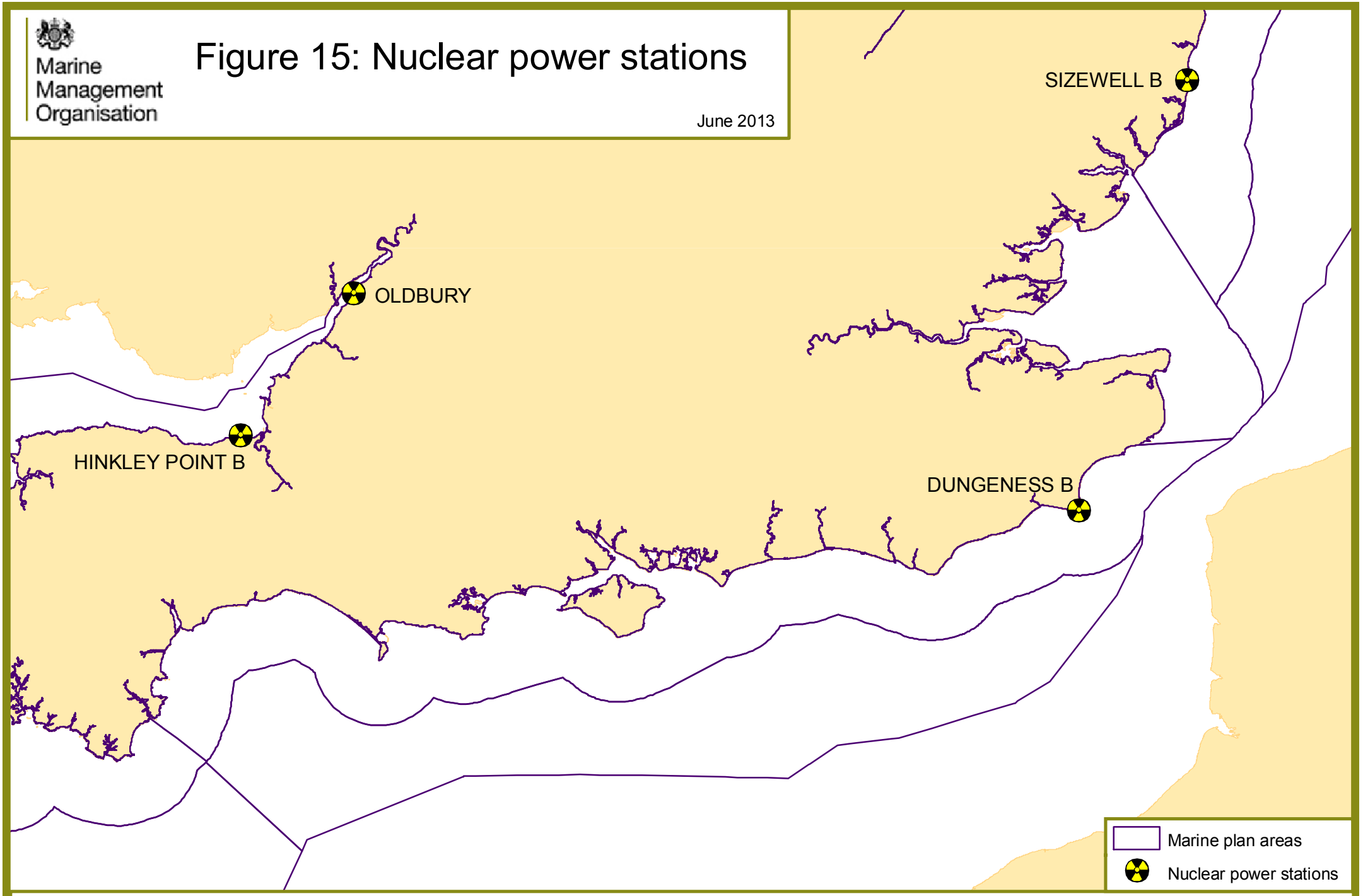
While no reference has been made regarding nuclear activity in sub national policy, Kent County Council has produced a local waste plan that confirms there are no implications that relate to nuclear waste. Any waste generated from Dungeness B is transported to Sellafield and Drigg for disposal. Incinerators are also on site to reduce the volume of low level contaminated solid waste[224].

[220] Draft South Marine Plan Futures Analysis 2013 para 8.2.2
[221] The Marine Policy Statement (2011), Energy production and infrastructure development, p 3.3.2 www.gov.uk/government/uploads/system/uploads/attachment_data/file/69322/pb3654-marine-policy-statement-110316.pdf
[222] The Marine Policy Statement (2011), Energy production and infrastructure development, p 3.3.2 www.gov.uk/government/uploads/system/uploads/attachment_data/file/69322/pb3654-marine-policy-statement-110316.pdf
[223] World Nuclear Association Website Update, Nuclear Power in the United Kingdom www.world-nuclear.org/info/Country-Profiles/Countries-T-Z/United-Kingdom/
[224] Kent Waste Local Plan – March 1998 p98 https://shareweb.kent.gov.uk/Documents/environment-and-planning/planning-and-land-use/waste-local-plan/waste-local-plan.pdf

Marine Management Organisation

Figure 15: Nuclear power stations

June 2013



Future trends

Decommissioning projects are set to take place over the next 10 years in readiness for a new round of nuclear reactors to be built. Dungeness B is currently set to start its decommissioning process in 2018. This will be subject to a review closer to the time and current timings may change. While no new sites for development have been identified in the South marine plan areas any new proposals that come forward during the lifetime of the marine plans must still be in accordance with the National Policy Statement (NPS) for Nuclear Power Generation (EN-6). Within the South marine plan area no new proposed sites have been identified for future nuclear developments.

In 2006 decommissioning began at the Dungeness A site, this is expected to run until 2033 where the final stages of the care and maintenance preparations will then complete. During this time economic benefit will reduce, with a major impact on the amount of employment available. It is estimated that around 260 jobs will lost between 2017 and 2019 from 310 during 2011/2012 down to 50 in 2018/2019[225]. However, there could be some socio-economic benefits for the area once the site is fully decommissioned. Opportunities for employment roles and potential skills development could look to boost income opportunities, such as redevelopment of the site which could lead to further income generation.

Where any decommissioning or future developments take place this should be carried out in line with EN-6. The NPS clearly outlines policies which have been designed to minimise adverse effects on marine ecology.

Potential key issues

Impacts on the coastline must be taken into account when any nuclear infrastructure development takes place. For Dungeness B this will relate to the current operations and also the decommissioning of the site, as opposed to further developments within the South marine plan area. Assessments on the seabed and any effects to the marine environment or existing coastal practices would be taken into account through the required environmental assessments.

Interactions with other sectors

Within the South marine plan area there has been limited interaction with other sectors. Where normal operating conditions occur at Dungeness B there has been little impact on other marine activities.

During decommission if dredging and disposal forms any part of nuclear activity advice must be sought form the MMO[226] before such activity takes place. Throughout this process the appropriate mitigation measures[227] [228] would have also

[225] Romney Marsh Economic Impact Assessment and Socio-Economic Action Plan – Oct 2011 www.sitestakeholdergroups.org.uk/dungeness/upload/Romney-Marsh-Economic-Impact-Assessment-and-Socio-Economic-Action-Plan-October-2011.pdf

[226] Overarching National Policy Statement for Energy (EN-1), Coastal Change, p 5.5.8 www.gov.uk/government/uploads/system/uploads/attachment_data/file/47854/1938-overarching-nps-for-energy-en1.pdf

[227] Overarching National Policy Statement for Energy (EN-1), Coastal Change, p 5.5.17 www.gov.uk/government/uploads/system/uploads/attachment_data/file/47854/1938-overarching-nps-for-energy-en1.pdf

identified and the relevant bodies notified. Impacts to any protected areas around the coast would also be assessed as part of this process.

Issues for sustainability

The NPS EN-6 highlights a number of impacts from nuclear power including:

- flood risk
- water quality and resources, including temperature changes to water and radionuclide emissions
- coastal change and impacts upon this, including water temperature changes
- biodiversity and geological conservation
- landscape and visual impacts
- socio-economic
- human health and well being.

2.6 Ports

Ports carry out a wide variety of activities including cargo handling, waterborne freight transport and shipbuilding and repair. These operations are supported by secondary activities including storage and warehousing, civil engineering works rail and road freight transport[229].

Current situation

The South marine plan areas host a number of English Channel ports serving freight, passenger and fishing industries as well as leisure interests, with 47 ports and harbours, the majority being smaller ports, catering primarily for fishing and leisure markets[230]. Around 500 commercial vessels per day use the Dover Strait Traffic Separation Scheme (TSS)[231]. This traffic has a significant bearing upon the business of these ports.

Ports include Southampton, which is the fourth largest port in the UK in terms of freight tonnage and leading passenger port. Other notable commercial ports include Teignmouth, Portland, Weymouth, Poole, Portsmouth, Shoreham, Newhaven and Folkestone. Smaller ports include Dartmouth, Exmouth, Lyme Regis, Christchurch, Lymington, Hamble, Eastbourne and Chichester[232]. The ports in the South marine plan areas received around 9.4% of shipping traffic in the UK, based on port ship arrivals in 2011[233] [234].

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[228] Overarching National Policy Statement for Energy (EN-1), Coastal Change, p 5.5.17 www.gov.uk/government/uploads/system/uploads/attachment_data/file/47854/1938-overarching-nps-for-energy-en1.pdf

[229] UKMMAS (2010) Charting Progress 2 Feeder Report: Productive Seas. Report to Defra, http://chartingprogress.defra.gov.uk/

[230] ABPmer (2013) South Marine Plan Futures Analysis. A report produced for the Marine Management Organisation by ABP Marine Environmental Research Ltd. MMO Project No: 1026-10.

[231] BMT Isis (2009), Reducing Risk in the English Channel/La Manche Traffic Separation Schemes, Report for Maritime and& Coastguard Agency, May 2009

[232] ABPmer (2013) South Marine Plan Futures Analysis. A report produced for the Marine Management Organisation by ABP Marine Environmental Research Ltd. MMO Project No: 1026-10.

[233] Department for Transport (2012) UK Ports, ship arrivals by type and deadweight: 2011, 10 November 2012. Accessed April 2013, www.gov.uk/government/statistical-data-sets/port01-uk-ports-and-traffic

A significant proportion of all non-EU seaborne trade passes through the Port of Southampton, more than any other port in the UK. The port accommodates a range of trades of national importance in the container, cruising, oil and petrochemicals, and motor vehicles sectors[235]. Within harbours and estuaries, the overall frequency of shipping movements (for all commercial vessels including ferries) can be very high. There were more than 64,000 shipping movements within Southampton Water during 2012[236] and more than 5,000 commercial vessel movements within Poole Harbour[237].

The Port of Dover in the South East marine plan area has not been considered as part of this report. A significant amount of marine traffic from Dover immediately next to the eastern boundary of the South marine plan area and transits the South marine plan areas.

Current policy

The National Policy Statement (NPS) for Ports[238] sets out the need for new port infrastructure, defining the approach that should be taken to proposals including the main issues which will need to be addressed. The NPS illustrates the need to cater for forecast long-term growth in volumes of sea trade.

Ports provide infrastructure for multiple activities and manage quayside space they provide. Ports are supported in sub-national plans by different authorities, this is summarised in the table below (note that this table is not exhaustive and is presented for illustrative purposes only). Beyond commercial operations, ports and harbours often provide recreation-related infrastructure including marinas. Sub-national considerations related to tourism and recreation activities are covered elsewhere in the relevant section of this report.

[234] This excludes the ferry traffic to and from the Isle of Wight.
[235] As footnote 231.
[236] ABP, 2013, personal communication.
[237] Poole Harbour Commissions (PHC), 2012. Poole Harbour Commissioners Draft Master Plan – Version 2. Poole: Poole Harbour Commissioners. 76 pages.
[238] Department for Transport, 2012. National Policy Statement for Ports

Table 6 Local planning policy in the South and references to port activity

	Draft Adur Local Plan (2012) – Shoreham	Arun District Council Draft Local Plan – Littlehampton and Pagham harbours	Brighton and Hove City Council Draft LDF – Shoreham Harbour	Dorset AONB Coast 2009-14 -	Teignbridge Local Plan 2013-2033	Chichester Harbour AONB Management Plan 2014-19	Gosport Borough Local Plan 2011-2029	Isle of Wight Island Plan – East Cowes and Medina Valley	Southampton LDF	Poole Core Strategy	Weymouth and Portland Local Plan	Havant LDF	Portsmouth Plan	Rother District Plan – Port of Rye
Regeneration and diversification beyond port or harbour use	Y		Y											
Supporting improvement of port operations or infrastructure	Y		Y					Y	Y				Y	
Safeguarding measures to manage impacts upon ports or harbours		Y			Y	Y	Y		Y	Y	Y	Y	Y	Y
Support port or harbour master plan	Y		Y											
Encourage sustainable transport			Y	Y					Y		Y			Y
Maintaining the character of a port or harbour space						Y								
Commitment to port or harbour focussed plan or strategy development	Y		Y					Y			Y			

Port and harbour master plans set out the way ports intend to develop over a given time period. These are not statutory, but are important tools supporting an understanding of their aspirations and how they can be supported where appropriate. Shoreham Port Master Plan has been flagged as a material consideration in Brighton and Hove City Council LDF[239] [240]. A summary of policy priorities for the port and harbour master plans available for ports in the South marine plan area is provided in the 'futures' section.

Value of the activity

Direct employment in the ports sector is estimated to be around 17,286 full time equivalents (FTEs). This figure is based on the direct employment in ports throughout the UK[241], and apportioned to the marine plan areas based on two apportion factors. For more detail on methodologies, please see the reports referenced [242] [243] [244] [245].

An estimated 24,601 jobs that are indirectly related to the industry, based on UK indirect employment in the sector[246], and 153 businesses in the plan area involved with ports, based on UK information from the Annual Business Survey[247]. The total GVA of the sector is currently estimated to be £1,165 million[248].

Activities taking place at the Port of Southampton have a significant impact on employment in the local area. Around 8,300 direct jobs are dependent on the wider port area, indirect employment supported by the port's activities accounting for some 9,370 jobs in the Solent region[249]. Taking into account jobs directly and indirectly supported by the oil terminals and defence installations, the port directly supports around 14,640 in the wider Solent region[250]. The port's role as a major employment generator becomes more important when considering the local levels of unemployment, low economic activity rates, and relatively high levels of deprivation[251]. These estimates of employment associated with the Port of

[239] Brighton and Hove City Council's LDF draft (Core Strategy February 3013 - draft)
[240] Draft Adur Local Plan 2012
[241] Oxford Economics (2013) The Economic Impact of the UK Maritime Services Sector: Ports, A report for Maritime UK (including regional breakdown), February 2013, www.britishports.org.uk/sites/default/files/ports_2012_final_report.pdf
[242] As footnote 238.
[243] Department for Transport (2011) Sea Passenger Statistics 2011. Available from: www.gov.uk/government/publications/sea-passenger-statistics-2011
[244] Oxford Economics (2013) The Economic Impact of the UK Maritime Services Sector: Ports, A report for Maritime UK (including regional breakdown), February 2013, www.britishports.org.uk/sites/default/files/ports_2012_final_report.pdf
[245] Department for Transport (2011) UK Port Freight Statistics 2011 Final Figures. Available from: www.gov.uk/government/publications/port-freight-statistics-2011-final-figures
[246] Oxford Economics (2013) The Economic Impact of the UK Maritime Services Sector: Ports, A report for Maritime UK (including regional breakdown), February 2013, www.britishports.org.uk/sites/default/files/ports_2012_final_report.pdf
[247] ONS (2012), UK Business: Activity, Size and Location – 2012, www.ons.gov.uk/ons/publications/re-reference-tables.html?edition=tcm%3A77-254601
[248] Inflated to 2013/14 values
[249] Atkins (2011) Economic Impact of the Port of Southampton, Final Report to Marine South East, August 2011. Accessed April 2013, www.marinesoutheast.co.uk/docs/research/
[250] As footnote 246.
[251] As footnote 246.

Southampton exclude employment attributed to cruise operations, generating around 1,200 jobs in the local area[252].

Businesses directly linked to the operation of the Port of Southampton generate a turnover of £772 million a year (excluding oil activities)[253], port businesses spending approximately 50% of their expenditure in the Solent, 20% in the rest of the South east and 20% in the rest of the UK, the remainder associated with international suppliers. The port's supply chain is a significant driver for local and regional economies, with 70% of the port's supply chain expenditure retained in the Solent region. Taking into account indirect turnover, the port generates some £1.27 billion of GDP a year at the Solent level, compared to £1.81 billion at the national level[254],

The Port of Portsmouth directly employs of 805 FTE jobs and injects £38.7 million into the greater Portsmouth area. Indirectly, these figures rise to 1,595 FTE jobs supported by port activity and a total estimated £71.3 million output throughout the greater Portsmouth area economy[255].

Port activity is inextricably linked to shipping and both must be adaptable so as to respond to changes in local, regional and global trade patterns. Dredging and disposal are both important activities to enable vessels to access ports and harbours.

Future trends

Drawing upon port master plans, the following offers an overview of objectives that, alongside responding to market demand, will direct and manage activity at ports in the South marine plan areas. The table below summarises the common aspirations of the port master plans in the South marine plan areas. It should be noted this table is not exhaustive and is for illustrative purposes only.

While existing plans provide an overview of likely activity to come, likely growth patterns can also be gleaned from annual business plans such as that available for Langstone Harbour.[256] This sets out that the importation of sea dredged aggregates provides around 30% of income (2008/09 figures), noting that Langstone Harbour has very limited wharfage and infrastructure with limited opportunity for expansion. The UK Government believes that there is a compelling need for substantial additional port capacity over the next 20 to 30 years, to be met by a combination of development already consented and those for which planning applications have yet to be received[257].

[252] Based on information provided by stakeholders at a MMO workshop held in London, 25th March 2013

[253] Atkins (2011) Economic Impact of the Port of Southampton, Final Report to Marine South East, August 2011. Accessed April 2013, www.marinesoutheast.co.uk/docs/research/

[254] As footnote 280.

[255] PIP, 2011. Portsmouth International Port Master Plan. www.portsmouth-port.co.uk/about_us/port_master_plan. Accessed on 14 February 2013.

[256] Langstone Harbour Board (LHB), 2012. Langstone Harbour Business Plan. www.langstoneharbour.org.uk/images/upload/files/about-theboard_acts_pdf_784.pdf. Accessed on 14 February 2013.

[257] DfT (2012) National Policy Statement for Ports, January 2012, http://assets.dft.gov.uk/publications/national-policy-statement-for-ports/national-policy-statement-ports.pdf www.gov.uk/government/publications/national-policy-statement-for-ports

It is likely that the largest absolute increases in trade volume are likely to occur through the Port of Southampton. Analysis to 2030 suggests increases of total tonnage from 38.83 million tonnes in 2005 to approximately 62.66 million tonnes by 2030[258]. Significant port expansion would be required to realise these trade volumes. The Port of Southampton Master Plan (2009-2030) identifies plans for future development at Dibden Bay.

Table 7 Summary of the port master plans' aspirations in the South marine plan areas

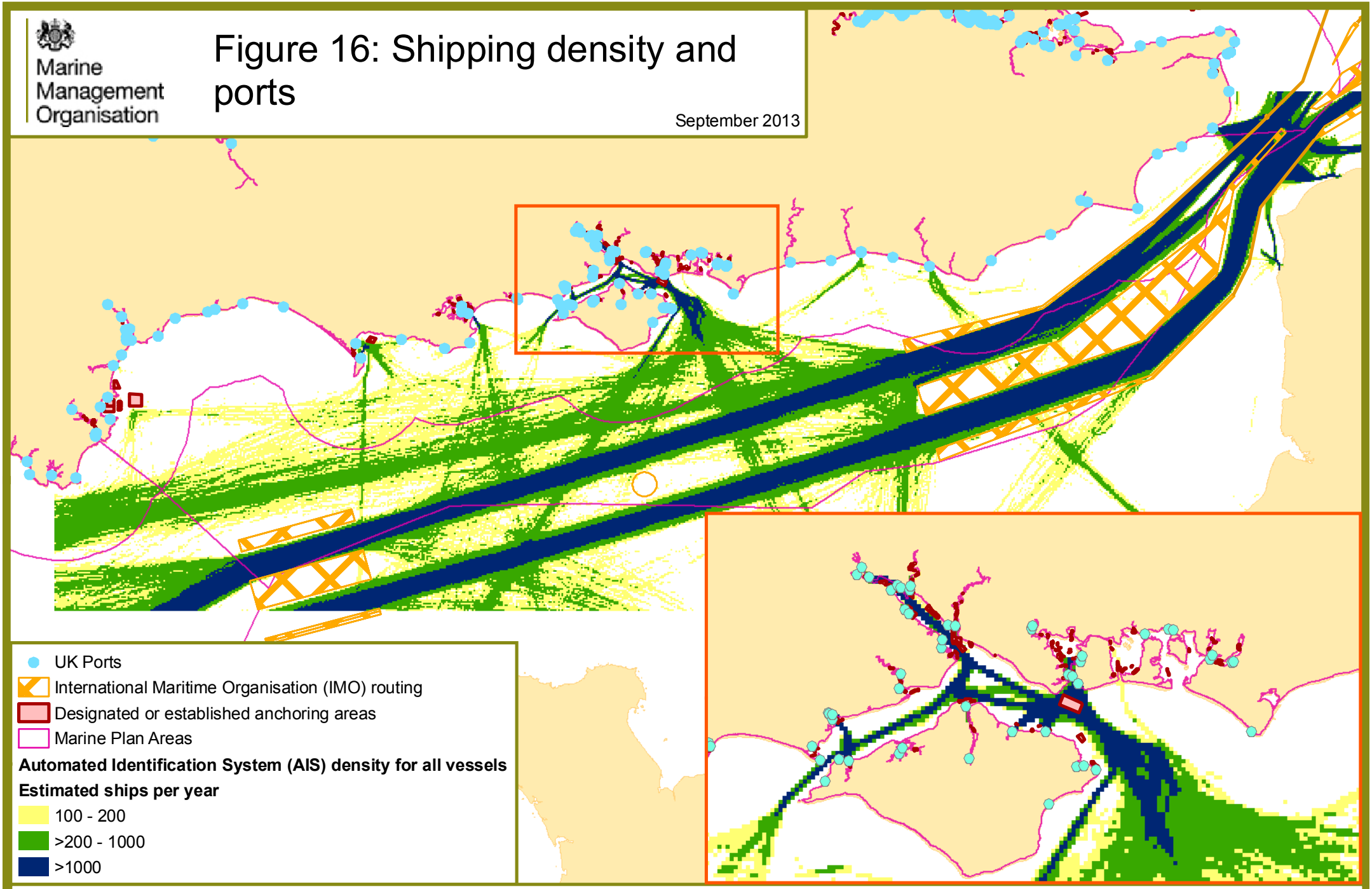
	Port of Southampton Master Plan 2009-[illegible]	Newhaven Port Master Plan 2012	Poole Harbour Commissioners Master Plan 2012	Portsmouth International Port Planning to 2026	Shoreham Port Master Plan 2010	Port of Dover Master Plan
Intensification of land use for key trade activity	Y					
Accommodate growth in deep sea vessel activity	Y					
Accommodate growth in container activity	Y		Y		Y	
Accommodate growth in Ro-Ro activity	Y	Y	Y	Y	Y	Y
Accommodate growth in cruise activity	Y		Y	Y	Y	
Accommodate growth in dry bulks and/or general cargo	Y		Y		Y	Y
Accommodate low carbon technology facilities	Y	Y	Y			
Accommodate fishing and/or leisure use		Y				
Provision of additional infrastructure or access	Y	Y	Y	Y	Y	Y
Working with others on connectivity	Y	Y		Y		Y
Working sustainably and with sensitivity towards the environment	Y	Y	Y			
Providing space for the public and/or the environment		Y			Y	
Redevelopment of existing port areas for other uses					Y	

[258] ABP, 2009. Port of Southampton Master Plan 2009-2030.

Marine Management Organisation

Figure 16: Shipping density and ports

September 2013



Within the South marine plan areas, there are two proposed Round 3 offshore wind farm developments, Navitus Bay and Rampion. Neither wind farm has received development consent from government. The earliest date for construction is 2014 (for Rampion) and 2017 (for Navitus Bay). For more information regarding these developments please see the offshore wind section of this report.

Should the development be granted approval, E.ON has selected Newhaven Port as their operations and maintenance base for the Rampion wind farm. E.ON would invest in the modernisation and redevelopment of Newhaven Port[259]. Navitus Bay has yet to identify the most suitable port for their base with Poole, Portland, and Yarmouth currently being considered[260].

As a consequence of the trend towards larger vessels, access to ports dependent on suitable tidal conditions is likely to become increasingly constrained. Increases in the numbers of deep-draughted, wider vessels, has already affected navigation within tidally-constricted ports. This will remain a key driver for the need for commercial ports to deepen and/or widen navigation channels[261].

Commercial ports compete with one another and future port developments outside the South marine plan areas have the potential to draw trade away from this region, to other UK or European ports. It is possible that more non-European cargo may be first landed in the Port of Rotterdam before being transported to the UK via short-sea trade routes from the Netherlands.

Historic trends

Ports generally employ fewer people today than they did 30 years ago. The industry continues to make a significant contribution to the UK economy[262]. Ports in the plan area handled 46 to 53 million tonnes of cargo a year over the last decade, although data indicates that the ports are currently at the lower end of this range, handling 46.5 million tonnes in 2011, showing on overall a declining trend since 2007[263].

Ferry passenger numbers have reduced in recent years. International sea passenger movements in the major passenger ports (Newhaven, Portsmouth, Southampton, Poole and Weymouth) have declined around 48% from 4.4 million in 2002 to 2.3 million in 2012[264]. Newhaven experienced the smallest decline in during this period

[259] E.ON, 2012. http://pressreleases.eon-uk.com/blogs/eonukpressreleases/archive/2012/10/02/1865.aspx
[260] Navitus Bay, 2013. www.navitusbaywindpark.co.uk/news/navitus-bay-wind-park-commits-local-port-and-jobs, accessed on 17 August 2013.
[261] UKMMAS, 2010. Charting Progress 2: An assessment of the state of UK seas. Prepared by the UK Marine Monitoring and Assessment Strategy (UKMMAS) community July 2010.
[262] Marine Management Organisation, 2011. Maximising the socio-economic benefits of marine planning for English coastal communities. Final Report. July 2011.
[263] Department for Transport (2012) UK Ports, ship arrivals by type and deadweight: 2011, 10 November 2012. Accessed April 2013, www.gov.uk/government/statistical-data-sets/port01-uk-ports-and-traffic
[264] Department for Transport (2012) Sea Passengers Statistics: SPAS01 - UK International Sea Passengers. Accessed May 2013, www.gov.uk/government/statistical-data-sets/spas01-uk-international-sea-passengers

(29%), followed by Portsmouth (45%)[265]. This decline should be treated with caution, as the ability of passengers to travel with vehicles should be considered, as well as the possibility that the reduction in numbers may not indicate a continuing trend with the possibility of a stable level of passenger traffic having been reached[266].

Traffic volume handled by UK ports has remained relatively constant over the past decade. Although the number of vessels visiting Southampton in particular has decreased in recent years, reflecting a change in the shipping line alliances (consortia) with the number of containers handled per vessel per port call increasing, demonstrating the achievement of economics of scale[267]. In the last decade south coast ferry ports saw major reductions in ferry passenger numbers. In 2011, Poole handled approximately 253,000 passengers, compared to 586,000 in 2001[268]. In contrast, there has been a sharp increase in the number of cruise ships visiting ports over the same period. Southampton is the busiest cruise port in the UK, with four passenger cruise terminals in operation and a fifth due to open in 2013. In 2012, over 1.2 million cruise passengers used the port, up from 702,000 in 2007[269] [270] [271].

The majority of port trade is driven by trade with other EU member states. Connected with this is the fact that ro-ro business in the UK represents 14% of the market whereas containers connected with international traffic, represent 10%, and quite a high proportion of this will be related to feeder traffic from within the EU. Ports common along the coast of the South marine plan areas[272] are much concerned with regional and local markets, focussed on Europe.

The UK ports are mainly owned and managed by the private sector and of marine plans have the potential to be assist the industry in the absence of other large scale spatial plans.[273]

The majority of port activity is driven by trade with other EU member states. This is reflected in the high proportion of ro – ro traffic in the UK, amounting to 14% of all traffic. Containers, largely generated by international traffic but nevertheless with a high proportion of feeder traffic from the Continent, represent 10 % of the total UK market.[274]

There is a wide variety of trade through ports around the UK. Some ports will be involved in national markets but there is a significant majority of ports which are very

[265] Poole Harbour Commissions (2012) Poole Harbour Commissioners Draft Master Plan - Version 2. Accessed April 2013, www.phc.co.uk/downloads/DraftMasterPlan-Version2Web.pdf
[266] Based on personal communication with the UK Chamber of Shipping, April 2013
[267] Personal communication with ABP, 12th April 2013.
[268] DfT, 2012a. UK Port Statistics 2011. Department for Transport. www.gov.uk/government/organisations/department-for-transport/series/ports-statistics. Accessed on 14 February 2013.
[269] ABP (2009) Port of Southampton Master Plan 2009 - 2030. Accessed April 2013, www.southamptonvts.co.uk/admin/content/files/PDF_Downloads/Master%20Plan/SMP.pdf
[270] ABP (2012) Port of Southampton Vessel Traffic Services. Accessed April 2013, www.southamptonvts.co.uk/
[271] Personal communication with ABP, 12th April 2013.
[272] Personal communication with BPA 9th July 2013
[273] Personal communication with BPA 9th July 2013
[274] Personal communication with BPA, 9th July 2013

much concerned with regional and local markets, focussed on Europe, and these ports are common along the coast of the South plan areas.[275]

In contrast to ports in many other countries, the UK port industry is mainly owned and managed by the private sector and while there are a number of plans and strategies in place at a local level the development of marine plans has the potential to be helpful to the industry in the absence of other large scale spatial plans.

Potential key issues

A number of port infrastructure development projects have been identified, including Southampton, Portland, Poole, Portsmouth and Newhaven. It is likely that the largest absolute increases in trade volume will occur through the Port of Southampton. The historic and future success of the port is due to the deep-water access, sheltered nature of the approach channels, and their proximity to the near continent and international shipping lanes[276]. Analysis to 2030 suggests an increase in total tonnage from 39 million tonnes in 2005 to approximately 63 million tonnes in 2030. Further significant port expansion plans for future development are identified in the Port of Southampton Master Plan[277].

Interactions with other sectors

The construction of additional port facilities may be required on the Dibden reclaim between 2021 and 2027[278]. Dibden Bay is recognised as the only place for significant expansion of the Port of Southampton. Port of Southampton is seeking to safeguard the site in the New Forest District Local Plan and the Hampshire Minerals and Waste Plan. It is likely that ABP will commence a master planning exercise of the proposed development within the next 6 years or so[279]. Master planning will no doubt include consideration of the prevailing designations at or adjacent to the Dibden Bay site as any impact upon these will need to be carefully managed.

Traditional activities associated with ports in the South marine plan areas include commercial shipping (management of related goods), provision for recreation and landing of aggregates. Increasingly, facilitating the installation and maintenance of offshore renewable energy will become a part of the port activities.

Issues for sustainability

Continued operation of ports depends upon the ability to respond to the needs of markets and, an ability to accommodate trends in international cargo movement, such as the need for deeper or new channels for vessels with deeper draughts. Many ports and harbours are located in designated areas in estuaries where there is a drive to maintain, and where possible improve, conditions for biodiversity. There may be an ongoing balance to be struck between maintaining the flexibility that enables thriving ports and the long term management of natural resources. Ports

[275] Personal communication with BPA, 9th July 2013
[276] Personal communication with ABP, 12th April 2013.
[277] ABP (2009) Port of Southampton Master Plan 2009 - 2030. Accessed April 2013, www.southamptonvts.co.uk/admin/content/files/PDF_Downloads/Master%20Plan/SMP.pdf
[278] Marine Management Organisation (2013) South Marine Plan Futures Analysis. A Report produced for the Marine Management Organisation by ABP Marine Environmental Research. MMO Project No: 1026-10
[279] Personal communication with ABP, 12th April 2013.

play an active role in the management of resources in adjacent estuaries with relevant conservation interests involved with major port developments from an early stage, helping to overcome issues before they arise.

2.7 Shipping

Key activities in shipping are sea and coastal freight and passenger transport, and cargo handling. Ancillary activities supporting the sector include dredging for access, disposal of dredged materials, building and repairing of ships, pilotage, berthing, storage and warehousing.[280]

The shipping sector is directly linked to the ports sector, within the marine plan areas exists one of the busiest shipping arteries in the world,[281] the English Channel linking the North Sea to the Atlantic, and home to a number of significant ports, like Southampton.

A significant amount of traffic is engaged in transporting goods and people across the Channel, between ferry ports including Weymouth, Poole and Portsmouth. A large proportion of the shipping in the Channel follows well defined routes, but vessels engaged in other activities, such as fishing or recreation, tend to navigate more freely within the area[282] [283].

Ships transiting through the South marine plan areas minimise the risk of collision by following Traffic Separation Schemes (TSS). Opposing traffic is divided into 'lanes' starting in the west with the Casquets TSS and continuing through the Dover Strait TSS with around 500 commercial vessels per day transiting[284]. A significant amount of traffic destined for major commercial ports in the Thames, Felixstowe and Rotterdam in the Netherlands passes through the IMO shipping lanes in the plan areas.

National priorities are the need for ships to be able to navigate in UK waters, and particularly in the approaches to UK ports, without hazard or excessive deviation.

Current situation

Around 54% of commercial vessels navigating within the marine plan areas call at UK ports or associated anchorages, or are UK to UK port vessels. Many of these transits are accounted for by passenger ferry services to French and Channel Island

[280] UKMMAS (2010) Charting Progress 2 Feeder Report: Productive Seas. Report to Defra. Available from: http://chartingprogress.defra.gov.uk/
[281] ABPmer (2013) South Marine Plan Futures Analysis. A report produced for the Marine Management Organisation by ABP Marine Environmental Research Ltd. MMO Project No: 1026-10.
[282] James, J W C, Pearce, B, Coggan, R A, Arnott, S H L, Clark, R, Plim, J F, Pinnion, J, Barrio Frójan, C, Gardiner, J P, Morando, A, Baggaley, P A, Scott, G, Bigourdan, N., (2010) The South Coast Regional Environmental Characterisation. British Geological Survey Open Report OR/09/51. 249 pp.
[283] ABPmer (2013) South Marine Plan Futures Analysis. A report produced for the Marine Management Organisation by ABP Marine Environmental Research Ltd. MMO Project No: 1026-10.
[284] BMT Isis (2009), Reducing Risk in the English Channel/La Manche Traffic Separation Schemes, Report for Maritime & Coastguard Agency, May 2009

ports, in addition to dredgers and aggregate vessels travelling to and from ports and aggregate grounds, or maintenance dredge craft working between ports and disposal sites[285]. Approximately 45% of all vessel traffic within the marine plan areas is associated with transitory traffic which does not call at a UK port. Much of this traffic is to or from major north European ports within the North Sea such as Rotterdam, Antwerp, Hamburg, Amsterdam and Bremen.

Deep draught (that is greater than about 16 metres) vessels (mainly tankers) transiting through the English Channel do not call at UK ports but are instead transit to or from the ports of Rotterdam and Hamburg. Large container vessels do call at ports within the South marine plan areas, the principal port being Southampton and to a lesser extent, Portsmouth. Locations of deep water anchorages can also be clearly identified, such as those located off to the east of the Isle of Wight, within Weymouth Bay and Tor Bay.

Passenger vessel routes are most closely associated with regular crossings from Poole, Portsmouth and Newhaven to continental European channel ports, with further routes including from Portsmouth to Bilbao. The majority of commercial high speed craft transits are also associated with the cross channel ferry routes from Weymouth, Poole and Portsmouth.

Shipping is regulated by global agreements through a specialised UN agency with responsibility for vessel safety and the prevention of pollution from ships, the remit of the International Maritime Organization (IMO). The IMO's primary purpose is to develop and maintain a comprehensive international regulatory framework for shipping with a remit including safety and environmental concerns, maritime security; and the efficiency of shipping. IMO conventions are wide ranging with concerns including:

- Safety of Life at Sea
- Prevention of Pollution from Ships
- Regulations for Preventing Collisions at Sea
- Facilitation of International Maritime Traffic
- Management of Ships' Ballast Water and Sediments[286]

As part of an integrated approach to transport planning, Europe and the UK both wish to see growth in shipping and have put in place measures to stimulate this growth, particularly in short sea and coastal shipping[287].

While shipping is regulated through international measures overseen by the IMO, various authorities such as in Dorset[288] are seeking to encourage domestic waterborne transport for a number of reasons. Shipping is a relatively low carbon transport mode so its use for UK to UK port transport can be a way to encourage carbon reduction. Looking across transport modes, waterborne transport in the

[285] ABPmer (2013) South Marine Plan Futures Analysis. A report produced for the Marine Management Organisation by ABP Marine Environmental Research Ltd. MMO Project No: 1026-10
[286] International Maritime Organization, www.imo.org/About/Conventions/ListOfConventions/Pages/Default.aspx, Accessed July 2013
[287] European Commission (2011) Roadmap to a Single European Transport Area
[288] Dorset AONB Coast 2009-14

context of local transport planning can play a part in releasing capacity in other modes. In the South marine plan areas, short sea (UK port to nearby European port) and coastal (UK port to UK port) shipping represents an important characteristic with very frequent journeys across the Solent between the Isle of Wight and mainland ports as well as between South coast ports and Europe. In numerous plans along the south coast including Torbay's Local Transport Plan[289], the maintenance and improvement of infrastructure supporting these routes is supported (further details in section 2.6).

Several specific measures are being put in place by authorities bounding the South marine plan areas seeking to enable the maintenance, development, diversification and growth of ports and harbours. It is expected that port developments will allow for larger vessels to be accommodated more frequently at the larger ports, while diversification of harbourside activities and facilities including those related to renewable energy will be reflected in an increase in the diversity of types of vessel operation.

The total GVA of the shipping sector is estimated to be £831 million in 2013/14.[290] This figure is derived from the UK GVA of the sector[291], and apportioned to the marine plan areas using two factors. The first based on the percentage of UK shipping revenue from carrying passengers (27%)[292] and passenger movements in the marine plan areas as a percentage of the UK total (28.5%)[293]. The second based on the percentage of UK shipping revenue from freight (73%, includes freight transported by passenger vessels)[294] and the number of vessels arriving in the marine plan areas as a percentage of the UK total (9.4%)[295].

Total employment in the shipping sector is estimated at 21,460 direct FTEs and 11,700 indirect FTEs. These figures are based on the UK totals apportioned to the marine plan areas considering the percentage of shipping GVA in the area compared to the UK total (15%)[296]. However, the number of businesses operating within the shipping sector is uncertain. Based on the proportion of vessels arriving in the South marine plan areas (9.4% in 2011/12)[297] and applying that proportion to the number

[289] Local Transport Plan for Torbay (2006 – 2011)
[290] This figure is inflated to 2013/14 values
[291] Oxford Economics (2013) The Economic Impact of the UK Shipping Industry, A report for Maritime UK (including regional breakdown), February 2013. Accessed April 2013, www.maritimeuk.org/wp-content/uploads/2012/01/The-economic-impact-of-the-UK-maritime-services-sector.-Shipping1.pdf
[292] Oxford Economics (2013) The Economic Impact of the UK Maritime Services Sector: Ports, A report for Maritime UK (including regional breakdown), February 2013, www.britishports.org.uk/sites/default/files/ports_2012_final_report.pdf
[293] Department for Transport (2011) Sea Passenger Statistics 2011. Available from: www.gov.uk/government/publications/sea-passenger-statistics-2011
[294] Oxford Economics (2013) The Economic Impact of the UK Maritime Services Sector: Ports, A report for Maritime UK (including regional breakdown), February 2013, www.britishports.org.uk/sites/default/files/ports_2012_final_report.pdf
[295] Department for Transport (2011) UK Port Freight Statistics 2011 Final Figures, Accessed April 2013, www.gov.uk/government/publications/port-freight-statistics-2011-final-figures
[296] Oxford Economics (2012) The Economic Impact of the UK Maritime Services Sector: Ports, A report for Maritime UK (including regional breakdown), February 2013, www.britishports.org.uk/sites/default/files/ports_2012_final_report.pdf
[297] Dept. for Transport (2012) UK Port Freight Statistics: 2011 Final Figures, September 2012, http://webarchive.nationalarchives.gov.uk/20121113191338/http:/www.dft.gov.uk/statistics/releases/port-freight-statistics-2011-final-figures/

of businesses identified in the Annual Business Survey[298], it is estimated that 253 businesses operated in the shipping sector in 2013/14.

The annual count of commercial vessel transits (of 300 gross tonnage (GT) and above) passing Beachy Head is around 60,000[299]. In comparison, the annual count of vessel transits passing Portland Bill to the outer boundary of the South Offshore marine plan area is around 28,000. The principal reason for this difference is the location of the east and west bound IMO Traffic Separation Scheme (indicated in the map at figure 16)[300].

Traffic intensity within the separation scheme, especially off Folkestone and Dover reaches an average weekly density of 250 vessels in 500 metres. A peak average weekly density of 315 vessels in 500 metres is observed at the intersection between cross channel traffic and the traffic separation scheme.

Ferry traffic from Southampton to Cowes, and Portsmouth to Ryde/Wootton Creek shows average 500 metres density's exceeding 500 transits a week. The peak transit count in the South marine plan areas is recorded in the entrance to Portsmouth Harbour at 165 transits within a 500 metres grid during one day[301].

Within the marine plan areas, there are few areas free of commercial traffic greater than 300 GT. Exceptions are found in isolated mid-channel areas, such as that found to the south of Beachy Head, in between the east and west-bound shipping lanes and within some inshore areas, including Lyme Bay, Christchurch Bay/Poole Bay, the Compton coastal section of the Isle of Wight and within the Selsey Bill to Newhaven coastal embayment. These inshore areas are not a direct transit between ports and therefore see very limited or no commercial shipping.

Future trends

There are limited alternatives to the use of sea transport for the movement of freight and bulk commodities, freight by air and train constrained by capacity. Consequently, shipping continues to provide the predominant way to move the vast majority of freight in and out of the UK, the provision of sufficient sea port capacity will remain an essential element in ensuring sustainable growth in the UK economy.

Forecasts indicate that UK sea trade will grow by 37% in six years, contributing £700 billion to UK GDP by 2017[302].

Over the next 6 years it is expected that the proportion of large vessels transporting goods will continue to increase, international shipping companies including the ro-ro and container lines, are continually seeking to achieve economies of scale in the transportation of goods. Similar trends are also observed with cruise ships and

[298] Office for National Statistics (2012) Annual Business Survey, 2011 Provisional Results, November 2012, www.ons.gov.uk/ons/publications/re-reference-tables.html?edition=tcm%3A77-276587
[299] MMO (2013) Spatial Trends in Shipping Activity. A report produced for the Marine Management Organisation, MMO Project No: 1042
[300] As footnote 293.
[301] As footnote 294.
[302] RSA (2012) Britannia rules the waves: UK shipping booms as sea trade exceeds £500 billion, April 2012, Accessed April 2013, http://news.rsagroup.com/pressrelease/view/1097

passenger ferries, new generation ferries being developed by the main cross channel companies continuing to increase in size[303].

Despite the trend towards increasing vessel size, overall shipping traffic is still likely to increase in future, given the general expansion in world trade and the desire to ease land transport problems. Indeed, the European Commission have a priority to reduce congestion on the roads of Europe and the TEN-T (trans-European networks) have several shipping corridors defined under Priority Project 21 including "motorway of the seas". Furthermore, shipping has been identified as an important means by which to mitigate the effects of climate change by facilitating the increased movement of freight by sea rather than road[304].

The introduction of new regulations in 2016 requiring the use of marine fuels with substantially reduced sulphur content will dramatically increase fuel costs for conventional ferries. The impact of these changes is the source of much uncertainty within the ferry industry and the longer sea crossing routes in particular. Developments in 2015 with respect to low sulphur fuel may affect some ports such as Portsmouth and Poole in which ferries are the main income generator.

Historic trends

While the volume of traffic handled by UK ports and waters has remained relatively constant over the past decade, there has been a sharp increase in the number of cruise ships visiting and travelling through UK waters[305]. This is in line with evidence suggesting that the UK is the fastest growing cruise market in Europe, with growth of over 250% between 1996 and 2007[306].

Trends in cargo vessel arrivals and associated freight tonnages handled in the marine plan areas' ports during the period 2001 to 2011 broadly follow the national-scale trends in shipping. From 2001 to 2011 total cargo vessel arrivals in the South marine plan areas declined from 14,422 in 2001 to 12,500 in 2011. However, this is offset against the trend towards increasing size of individual cargo vessels.

Increasing freight tonnage during the period 2001 to 2007 in the South marine plan areas was followed by a sharp decline during the period 2008 to 2011 as a result of the economic downturn. These effects are most evident at Southampton, experiencing a drop in cargo vessel arrivals of around 20% between 2008 and 2009. However, by 2011 the number of cargo vessel arrivals at Southampton had returned to around 5,000 per annum. Between 1980 to 2007 total traffic through Southampton increased by 83%, in spite of two periods of economic recession in the (ABP, 2009).

[303] UKMMAS, 2010. Charting Progress 2: An assessment of the state of UK seas. Prepared by the UK Marine Monitoring and Assessment Strategy (UKMMAS) community July 2010.
[304] HM Government 2011. Marine Policy Statement. www.defra.gov.uk/environment/marine/protect/planning/ www.gov.uk/government/policies/reforming-and-managing-marine-fisheries-for-a-prosperous-fishing-industry-and-a-healthy-marine-environment. . Accessed on 14 February 2013
[305] As footnote 298.
[306] ABP (2009) Port of Southampton Master Plan 2009 - 2030. Accessed April 2013, www.southamptonvts.co.uk/admin/content/files/PDF_Downloads/Master%20Plan/SMP.pdf

Potential key issues

Overall, offshore wind farm development presents an opportunity for sector diversification to include installation and servicing vehicles. However, it should be acknowledged that there is also a risk associated with the growth in renewable energy; especially Round 3 offshore wind farms in relation to the growth of the Shipping sector within the South marine plan areas. If shipping routes are obstructed, the economic viability of some vessels coming to ports within the marine plan areas might be compromised resulting in a detrimental impact on the growth of the sector. Resolving such matters is informed by discussion between representative parties, including the relevant UK regulator for shipping safety the Maritime and Coastguard Agency (MCA) and related guidance such as Marine Guidance Note 371[307], and are examined on a case by case basis as part of project development processes as proposals come forward.

While ports are developing to accommodate diversified and increased shipping activity there will still be a significant amount of through traffic within the marine plan areas. It is important to take this into account when discussing the shipping sector in the South marine plan areas.

Increased competition for marine resources affecting the sea space available for the safe navigation of ships remains a key issue for the sector[308]. Shipping can co-exist with marine conservation, fishing and aggregate extraction but there are other uses of the sea in respect of which this cannot be said. Potential exists for marine planning to help address this issue in the future by ensuring that other, conflicting uses of the sea – such as offshore wind farms – do not make it more difficult for ships to navigate safely or are developed in such a way as to avoid excessive deviation from planned routes.

Interactions with other sectors

The shipping industry is strongly linked to the state of the UK economy, and to the effectiveness of the ports industry to accommodate demand for import and export of goods, are vulnerable to global scale macro-economic trends. The current economic situation has led to a severe downturn in demand; however in the long term this is unlikely to reduce the eventual levels of demand for port capacity, in particular for unitised goods[309]. Similarly to the ports sector, the shipping sector will continue to grow due to demand from sectors that are able to operate independently of the economic issues, e.g. renewable energy. While a portion of the sector does depend on the health of the economy, the strong growth in renewable energy will allow the sector to continue to grow over the coming years.

Issues for sustainability

Two sulphur emission control areas (SECA) were established by the International Maritime Organization. The Baltic SECA took effect in May 2006, while the North Sea SECA (including the full length of the English Channel) came into force from November 2007.

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[307] Maritime and Coastguard Agency (MCA) (2008) Offshore Renewable Energy Installations (OREIs) – Guidance on UK Navigational Practice, Safety and Emergency Response Issues

[308] Defra (2011) Marine Policy Statement

[309] MDS Transmodal (2011) Port Infrastructure Development UK. Accessed April 2013, www.mdst.co.uk/attachments/downloads/PID_presentation_v1.pdf

In 2010 the amount of sulphur content in ships fuel used within a SECA was reduced from 1.5% to 1.0%. The ship owner has a choice of whether to use either a higher quality fuel (low sulphur marine gas oil) or the cheaper heavy fuel oil, providing the exhaust gases of the latter are cleaned before emissions[310].

The European Parliament has also incorporated an IMO accord that will lower sulphur in fuel used by all ships in the Baltic Sea, the North Sea and the English Channel to 0.1% in 2015 from 1% now. There are concerns that this new regulation may lead to an increase in sea transport costs. Resultant cost increases for transportation by sea have the potential to reduce the competitiveness of short-sea shipping transport against other transport modes. This may affect some ports in which ferries are the main income generator, such as Portsmouth and Poole[311].

New intermodal maritime-based logistics chains in Europe should bring about a structural change in European transport organisation. Integral to this is the concept of "motorways of the sea" which should encourage an increase in the transportation of goods via ships rather than by road.

Displacement of commercial shipping interests by offshore wind farms is being minimised through discussion between parties and the licensing process. It should be noted that there is still potential for related, as-yet unquantified cumulative effects to arise. This relates to the fact that commercial shipping is set to grow in terms of both frequency and size of vessel, the second of these factors impacting upon manoeuvrability (such as increased size of turning circle and stopping distances). In addition, recreational vessel movements are set to increase and traffic related to installing and maintaining offshore wind farms will emerge. Furthermore, fishing vessel numbers may increase in the future (depending upon the outcome of Common Fisheries Policy (CFP) reform).

While smaller vessels, including those servicing wind farms, may be operating within wind farms it is likely that a proportion of the recreational and wind farm-related traffic will seek to share space with displaced commercial shipping. As well as the increased risk of collision arising from vessel density in these areas, another risk emerges when considering that commercial shipping operators can face challenges detecting other vessels within wind farms. This means that when these smaller vessels emerge from wind farms they may be in unexpectedly close proximity to commercial operators. As conversations around wind farm development processes continue, it is likely that the potential risks to commercial shipping posed by cumulative effects can be mitigated, particularly in association with improving technology, but developing offshore wind farms in light of limited knowledge of consequent trends in use continues to carry a level of risk.

[310] UKMMAS, 2010. Charting Progress 2: An assessment of the state of UK seas. Prepared by the UK Marine Monitoring and Assessment Strategy (UKMMAS) community July 2010.
[311] ABPmer (2013) South Marine Plan Futures Analysis. A report produced for the Marine Management Organisation by ABP Marine Environmental Research Ltd. MMO Project No: 1026-10.

2.8 Marine aggregate extraction

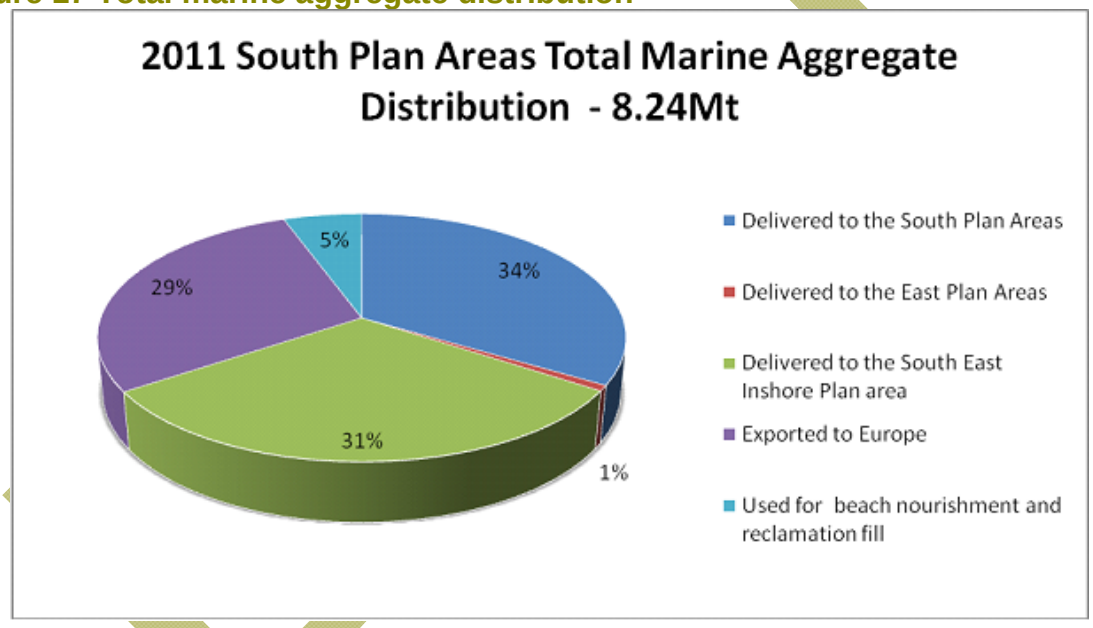
The South marine plan areas are currently the second busiest area in England for marine aggregate extraction in terms of tonnage dredged, licensed area and area dredged and a significant proportion of future search areas. The total area that is licensed for aggregate extraction within the South marine plan area is 254.36 square km.

Current situation

The annual production figures for 2012 show a total of 8.1 million tonnes (Mt) of aggregates were extracted from the South marine plan areas[312]. Of the total aggregate extracted 88.41% (7.2 Mt) was used for construction aggregates and 11.59% (0.9 Mt) for the purposes of beach nourishment. From the total 16.7 Mt of marine aggregate extracted nationally in England approximately 48% was taken from the South marine plan areas.

In 2011 of the total 8.24 Mt extracted from across the South marine plan areas[313]:

Figure 17 Total marine aggregate distribution



Current policy

The National Planning Policy Framework (NPPF) states that minerals are essential to support a sustainable economy and that plans (including marine plans) should safeguard areas of marine aggregate extraction that are of local or national importance.

The NPPF and the supporting Managed Aggregate Supply System (MASS) facilitates the long term-planning for aggregate supply in England. This system ensures that mineral planning authorities (MPA) have adequate aggregate resource to meet local and national supply. MASS requires MPA to prepare local aggregate

[312] Marine aggregates The Crown Estate licences summary of statistics 2012
[313] www.bmapa.org/documents/BMAPA%20_14th_annual_review.pdf

assessments that consider the opportunities and constraints for mineral supply to a specific region. This means that land-locked counties within the South marine plan areas may have to consider the need for marine aggregate particularly where land-based resources are becoming constrained.

The national and regional guidelines for aggregate supply in England for 2005 to 2020 indicate that 16 Mt per annum (Mtpa) of marine sand and gravel should contribute to national supply.

Terrestrial mineral and waste management plans within the South marine plan areas contain policies that highlight the need to safeguard suitable wharf and transport facilities for landed marine aggregates. This is particularly important for the South marine plan area as 38% of sand and gravel demand is met from the marine area. Specifically, the Isle of Wight retains roughly 80% of the aggregates landed on its shoreline. In 2012 Shoreham Harbour Wharves recorded the highest figure for material landed in the plan areas at 1.05 Mtpa. Southampton has the second highest landing activity, with 0.73 Mtpa[314].

Marine aggregates extracted from within the South marine plan areas are landed across other plan areas. This highlights the duty to co-operate for public authorities when preparing terrestrial and marine plan documents (section 33 A of the Localism Act 2011[315]).

Value of the activity

Within the South marine plan areas there are currently seven businesses active in marine aggregate extraction. The forecast economic value of this activity for 2013-14 is £143 million Gross Value Added (GVA). The direct employment of the sector within the South marine plan areas is estimated to be around 178 full time equivalents (FTEs). The sector acts as an important 'enabler' for indirect employment of 924 FTEs in other industries, such as construction.[316]

Marine aggregate extraction in the South marine plan areas takes place in two locations, which are the east English Channel and the South coast region (where marine licences are located around the Isle of Wight). Figure 18 illustrates marine aggregate consented licences (accurate up to 5 October 2012) located in the South marine plan areas.

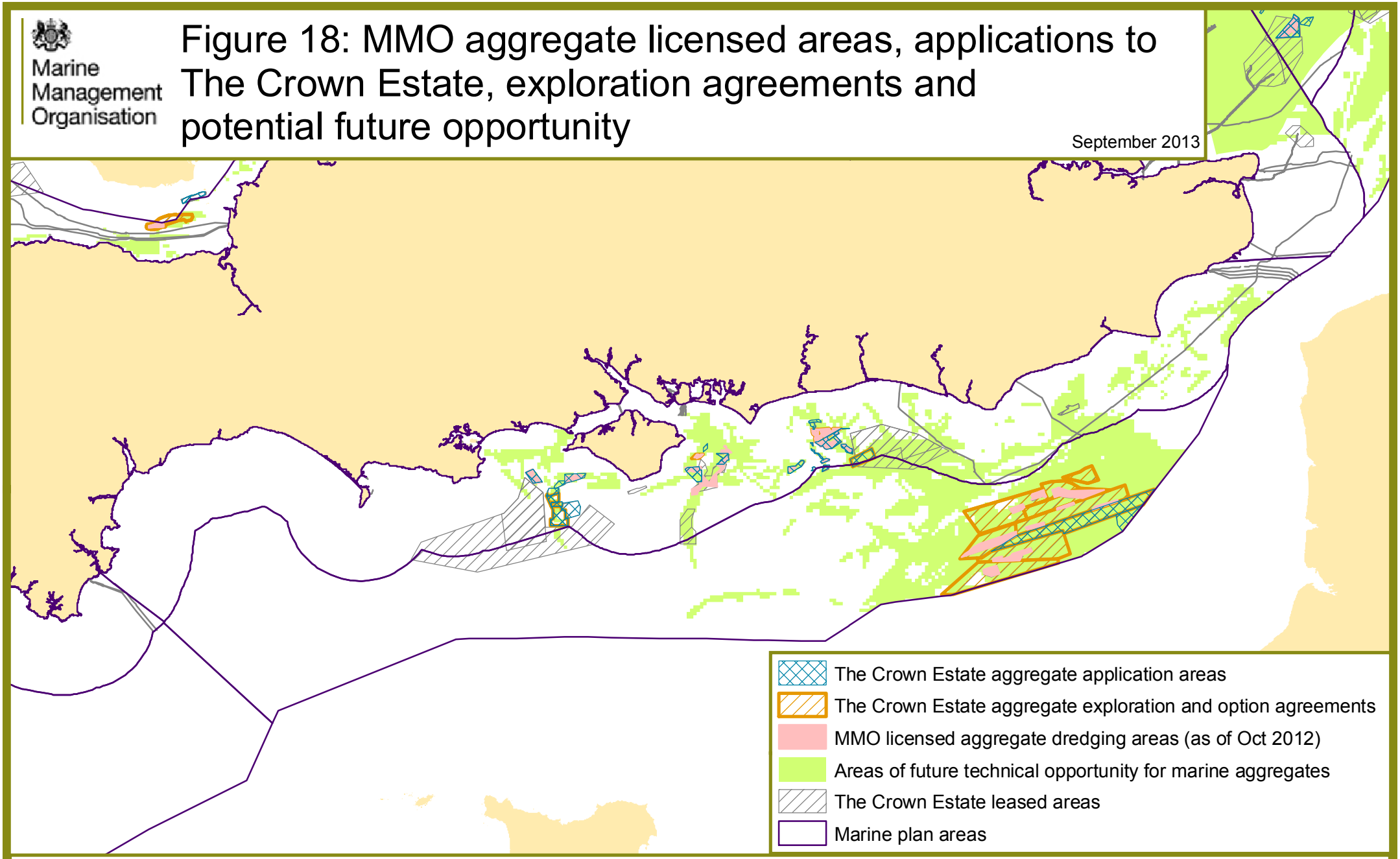
Within these two regions marine aggregate is extracted by the East Channel Association[317] and the South Coast Dredging Association[318]. In the South coast region aggregate extraction has occurred (via consented aggregate dredging licences) since the 1970s[319]. Marine aggregate extraction started in the east English Channel region in 2006.

[314] Marine Aggregates The Crown Estate Licences Summary of Statistics 2012
[315] www.legislation.gov.uk/ukpga/2011/20/section/110/enacted
[316] MMO, 2013. Economic Baseline Assessment of the South Coast
[317] www.eastchannel.info/pr_ass01.htm
[318] www.marine-aggregate-rea.info/scda
[319] www.marine-aggregate-rea.info/scda-south-coast-dredging-association

Marine Management Organisation

Figure 18: MMO aggregate licensed areas, applications to The Crown Estate, exploration agreements and potential future opportunity

September 2013



Note: The areas of future technical opportunity do not include the presence of hard constraints posed by existing uses of the marine estate or other factors including natural & cultural resources, marine users, economics & market appetite and policy drivers required for the opportunity to be supported. Cables and pipelines outside of the territorial waters limit (other than export cables) are not shown as they are not subject to The Crown Estate's permission

Future trends

Within the past 20 years, the area permitted for dredging within the South marine plan areas has changed. Some aggregate extraction areas have reduced in size, others have been surrendered and several new marine licences have been granted.

The economic recession in 2006 caused a downturn in construction activity that reduced the demand for construction aggregates from land and marine sources. While the area dredged has returned to pre-economic recession operating levels, no significant increase has occurred since in either the east English Channel or South coast region.

Beach replenishment continues to be important for the South marine plan areas. This is due to the maintenance of amenity beaches, at tourist destinations (throughout Dorset), and of coastal protection (Shoreham, Sussex). Dredging for beach replenishment in the South marine plan areas peaked in 2006 at over 10% of marine aggregates.

Potential key issues

- The determination of the 15 year marine licence applications for dredging within the South marine plan areas currently or due to be submitted to the MMO over the next two years will mean that the marine plans, with their 20-year focus, will have an influence on the marine aggregate industry over a 30-year period.
- Much of the current dredging fleet is coming to the end of its lifecycle therefore the South plans could influence the marine aggregate industry's next cycle of capital investment estimated to be £1 billion.

Interactions with other sectors

- Due to the diverse number of activities taking place within the South marine plan areas, co-existence and possible displacement of activities from other areas (Round 3 wind farm zones, cabling and capital dredge and disposal sites, fishing, increased shipping and possible infrastructure) onto marine aggregate resource and marine licence areas must be considered.

Issues for sustainability

The South coast and East English Channel marine aggregate regional environmental assessments (MAREA) have produced cumulative impact assessments for the marine aggregates extraction industry and the potential effects on other marine industries. The detailed assessment indicates that current extraction activity is within current acceptable environmental limits. This is supported by site-specific assessments by the MMO and its advisers on an application-by-application basis, and by research into cumulative effects between dredging in the East English Channel aggregates region and commercial fisheries[320]. Analysis of the vessel monitoring system data suggests the permitted extraction has had no effect on the density and intensity of fishing activity within the South marine plan areas.[321] Currently research is being undertaken to understand cumulative effects on regional fisheries within the South marine plan areas with particular attention to herring and sandeel.

[320] www.cefas.defra.gov.uk/alsf/projects/socio-economic-issues/08p73.aspx#
[321] As footnote 314.

2.9 Dredging and disposal

Dredging and disposal plays a vital part in ensuring the maintenance of navigational channels, berths and docks in and around ports and marinas.

Dredging focuses on the extraction of sediment from the sea bed in order to maintain deepen or widen navigational channels and access routes. The constant traffic causes sediment to continue to gather in these areas, requiring ongoing work to prevent these channels becoming too shallow for vessels to access. Dredging can be separated into two types as follows:

- maintenance dredging – removal of sand, mud and gravel in order to maintain safe navigational access at all times. This would usually involve repeat dredges or a series of cycles[322]
- capital dredging – deepening and/or widening existing channels and creation of new channels[323]

Current Situation

Within the South marine plan areas there are 23 active sites for marine dredging disposal. These are largely used by companies who carry out navigational dredging throughout ports and harbours. There are a further 31 unused disposal sites historically used for a variety of activities such as liquid industrial waste, munitions, and dredged materials. Nab Tower, to the south east of the Isle of Wight, was the site within the South marine plan area to receive the largest amount of dredged material. Between 1986 and 2010 Nab Tower received an annual average of 1.3 million tonnes of dredged material. This amount increased to over 7 million tonnes during 1997 as a result of work being carried out in Southampton water. Other major disposal sites in the area include Swanage Bay, Shoreham, Newhaven and Dover.[324] Within the South marine plan areas the major rivers and navigational channels that are dredged include:

- The Solent
- Poole Harbour
- Southampton Water
- Portsmouth Harbour

This equates to an estimate of £0.61 million of GVA in 2013-14.

Economic activity in the South marine plan areas remains hard to establish due to a lack of clear data disaggregated from that for the UK. The GVA for this sector is an estimation based on direct employment in licensed water discharges. [325] It is estimated that around 9%[326] of the activity that takes place within ports is located in the South marine plan area. Arrivals from tankers, ro-ro vessels, container vessels,

[322] Marine licensing guidance 3 Dredging, disposal and aggregate dredging April 2011 p7
[323] East Inshore and Offshore Evidence and Issues Report p125
[324] ABPmer (2013) South Marine Plan Futures Analysis. A report produced for the Marine Management Organisation by ABP Marine Environmental Research Ltd. MMO Project No: 1026-10.
[325] UKMMAS (2010) Charting Progress 2 Feeder Report: Productive Seas, Defra on behalf of UKMMAS, 2010, http://chartingprogress.defra.gov.uk/feeder/PSEG-feeder.pdf
[326] Based on the number of vessels arriving in key ports within the marine plan areas (Cowes, Newhaven, Poole, Portsmouth, Rye, Shoreham, Southampton, Teignmouth and Weymouth & Portland), as a percentage of the UK total.

passenger and other vessels have been included [327] and equates to around £0.61 million of GVA in 2013-14. It is worth noting that this may not be a true reflection of capital and maintenance dredging in the South marine plan areas compared to the rest of the UK, but is thought to indicate a reasonable proxy.[328]

The following points are drawn from various information sources and will be considered as part of establishing plan policies and objectives during the plan-making process.

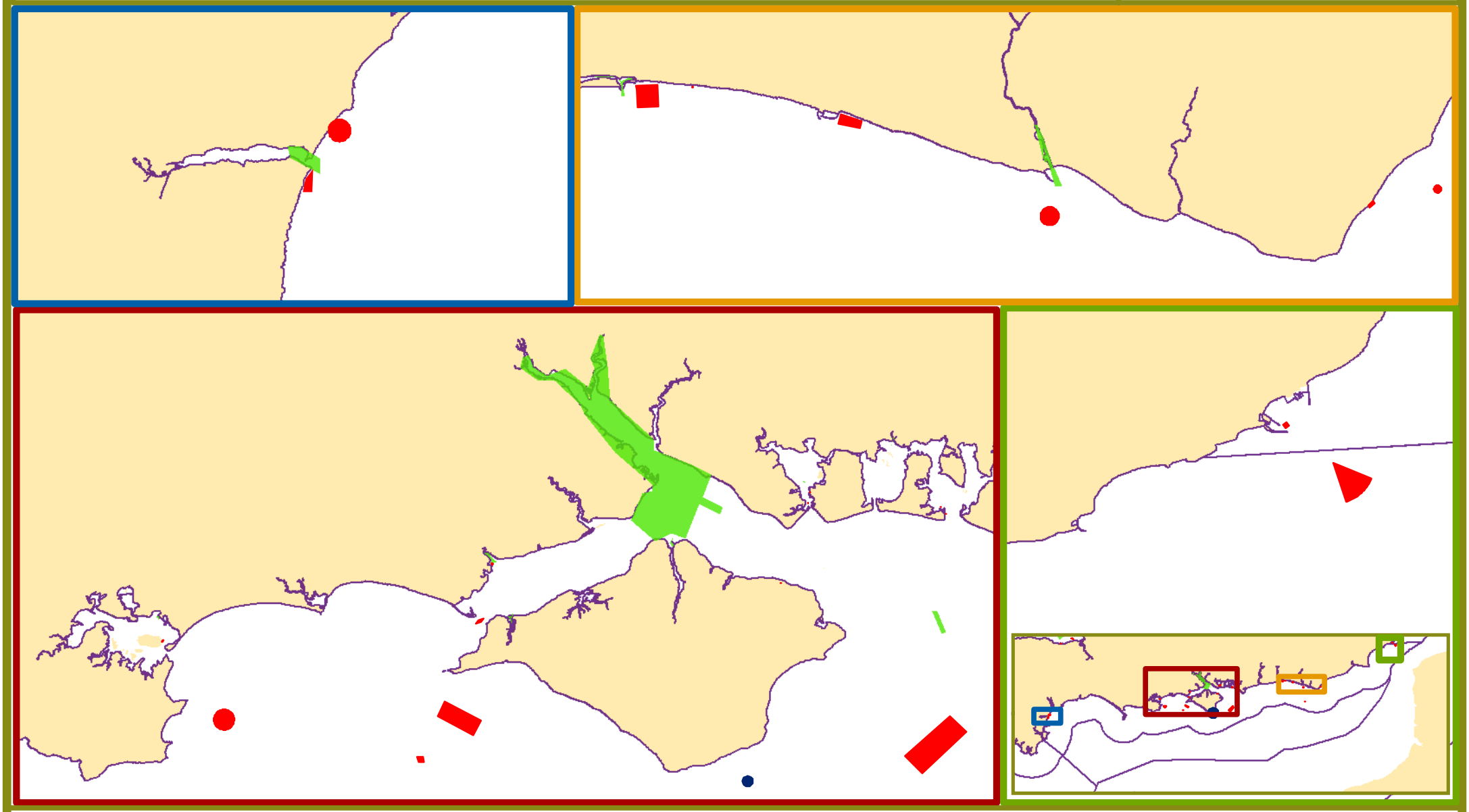
- The development of a maintenance dredge protocol provides assistance to operators and regulators seeking or giving approval for maintenance dredging activities that could potentially affect European sites (also known as Natura 2000 or N2K sites) around the coast of England. [329]
- The Environment Agency, in their role as the competent authority for the Water Framework Directive (WFD), will consider the effects of dredging and disposal activities on water status. The WFD applies to waters out to one nautical mile from the baseline from which territorial waters are drawn. [330]
- The Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter 1972 (The London Convention) is an agreement to control pollution of the sea by deliberate disposal of wastes or other matter from vessels, aircraft and platforms. [331]
- The Convention for the Protection of the Marine Environment of the North-East Atlantic (The OSPAR Convention) regulates international cooperation on environmental protection in the North-East Atlantic. It updates the 1972 Oslo Convention on dumping waste at sea and the 1974 Paris Convention on land-based sources of marine pollution. [332] Requirements set out in 1992 direct contracting parties to take all possible steps to prevent and eliminate pollution and to take the necessary measures to protect the marine area against adverse effects of human activities to safeguard human health and conserve marine ecosystems [333]

[327] Dept. for Transport (2012) UK port freight statistics: 2011 final figures, September 2012 www.gov.uk/government/statistical-data-sets/port01-uk-ports-and-traffic
[328] MMO (2013) Economic Baseline Assessment of the South Coast
[329] Defra (1994) Maintenance Dredging and the Habitats Regulations 1994, p4
[330] Environment Agency (2000) www.environment-agency.gov.uk/research/planning/33362.aspx
[331] MMO – Marine Licensing Guidance 3, p18
[332] OSPAR Commission,www.ospar.org, October 2011
[333] MMO – Marine Licensing Guidance 3, p18

Marine Management Organisation

Figure 19: Licensed dredging and disposal areas

September 2013



Future Trends

The areas permitted for disposal have altered over the last 20 years. A large number of sites have been closed, partly in response to legislative changes restricting the disposal at sea of certain types of material such as munitions and liquid industrial waste. Based on information available on the 5 main sites, in the same period there has been no consistent trend in the volume of material that has been disposed of at these sites within the South marine plan areas. Short-term, inter-annual fluctuations are evident in the amount of material disposed of at each site, which typically reflects contributions from capital dredge projects in nearby ports and harbours.

This overall picture is consistent with the UK as a whole, with the amount of dredged material disposed of at sea each year relatively consistent since 1985 (HM Government, 2011)[334].

Looking ahead the level of maintenance dredging will, at the minimum, be sustained, whereas capital dredging is likely to increase due to potential port expansion projects. This will be driven by increased shipping activity coupled with larger vessels which may require applications to dredge deeper, wider and more frequently at ports, harbours, and approaches. Various capital dredging projects are planned for the Port of Southampton, in order to improve access for the deep-draughted vessels that currently use the channel, including the large 15.5 m draughted container vessels that are now being brought into service by the world's major shipping lines. Dredging of the Southampton approach channel, widening of the channel at the Marchwood Western Docks, and reconstruction and deepening of some berths is scheduled to commence by the end of 2013. Approximately 11.6 million m^3 (circa 20 million wet tonnes) of capital material may be dredged over the next six years and will primarily be disposed of at the Nab Tower disposal site [335].

This amount of dredge disposal will be equivalent to 9 times the current annual average received by Nab Tower. In addition to commercial ports and shipping drivers, it is likely that a number of existing marinas will expand in response to increasing demand for recreational boat moorings. Any increase in capital dredging is likely to result in increases in maintenance dredging.

A major expansion has also been planned to improve the Portsmouth Naval Base facilities over the next ten years in order to accommodate the new Queen Elizabeth Class aircraft carrier. The project includes various capital dredge works set to start in 2014-15 and it is likely that material will primarily be disposed of at the Nab Tower disposal site[336]. Smaller capital dredge works are also proposed for Poole Harbour and include the deepening of existing conventional quays to 7.5 metres within the next six years, with dredge spoil largely being disposed of at the Swanage Bay disposal site.

These capital dredge projects and ongoing maintenance dredge requirements will have a direct effect on the amount of material to be disposed at sea. This may

[334] Defra (2011). UK Marine Policy Statement. TSO: London.
[335] ABP (2013) Southampton VTS Development Proposals at the Port of Southampton. Accessed in April 2013 www.southamptonvts.co.uk/Port_Information/Development_Projects/Approach_Channel_Dredge/
[336] MMO (2013) South Marine Plan Areas Futures Analysis. MMO Project No: 1039

necessitate an increase in the number of disposal licence applications within the South marine plan areas. However, the spatial extent of existing disposal areas is not likely to increase in size; therefore existing disposal sites may receive a higher volume of dredged material[337].

Potential key issues

- Increased demand for capital dredging and disposal sites due to a trend towards larger ships, particularly in bulk and container shipping. .

Interactions with other sectors

Directly, dredging creates no identified issues for other commercial, leisure, and recreation-focussed sectors though it is the case that sectors enabled by this activity, predominantly ports and shipping, may create issues. There is the potential for wider impacts upon biodiversity and ecosystems of both maintenance and capital dredging to emerge both directly and as a contributor to cumulative effects. These are outlined in the following section on sustainability and cumulative effects but are commonly managed and mitigated through measures established at the point of licensing the activity.

Issues for sustainability

- potential risk to marine life and ecology through changes in water quality (relating to changes in chemistry and turbidity), noise and physical disturbance
- the release of contaminants (legacy of industrial pollution)
- impacts on designated nature conservation areas (potential destruction or destabilisation)
- degradation of heritage assets through direct or indirect physical activity
- effects on a coastal landscape and/or seascape (for example, maintenance through beach nourishment or disturbance of subsea features at disposal grounds)
- changes to natural sedimentary systems via physical changes to contributing structures e.g. alteration of channel depths.

2.10 Subsea Cabling

Submarine cables are part of the backbone of the world's power, information and international telecommunications infrastructure, and are socially and economically crucial to the UK. Submarine telecommunication cables carry over 95 per cent of the world's international communications traffic including telephone, internet and data. Generally cables support many other services, both power and telecommunications for the UK's local communities, major utilities and industries. The transatlantic telecommunication cables landing in the UK carry more than 70 per cent of Europe's transatlantic internet traffic.[338]

Current Situation

Within the marine plan areas around England, as at May 2013 there are currently 14,575 kilometres of submarine cable. Within the South marine plan areas there are

[337] MMO (2013) South Marine Plan Areas Futures Analysis. MMO Project No: 1039
[338] Defra (2010) Marine Policy Statement, p41

1,357 kilometres of submarine cable which make up around 10% of the total length of cables in the English marine plan areas and 31% of the number of cables in the English marine plan areas [339]. The total footprint of these cables in English marine plan areas covers around 0.21km^2 of the seabed, however it is important to bear in mind additional buffer zones either side of the cables exist in order to protect them from damage and allow for repair and maintenance. Another point to bear in mind is that there are sometimes buffer zones around certain cables of approximately 250m. These buffer zones can be sometimes greater where they intersect with other activities.

The following relevant goals/objectives and policies drawn from the MPS and the 2013 Budget Statement are highlighted by way of context for the South although note that identifying objectives and deriving planning policies are later steps in the planning process:

- The importance of telecommunication and power cabling as vital infrastructure for the domestic and global economy and, as such, should be reflected in marine plans[340].
- Timely development of the telecommunications network in all parts of the UK is vital to help ensure the government's commitment to the minimum broadband speed promise[341]. Submarine telecommunications cable connectivity is a vital part of delivering a high-quality superfast broadband experience to users.
- The 2013 Budget Statement stated as part of the economic recovery..."We can provide the economy with the infrastructure it needs...We are giving Britain the fastest broadband and mobile telephony in Europe."[342] This in turn may well require new infrastructure or upgrades to existing infrastructure.
- Studies have concluded that there are no overriding environmental reasons to prevent achievement of sub-sea grid power development up to 2020.[343]
- When decision makers are examining and determining applications for communications or energy infrastructure and marine plan authorities are developing marine plans they should take into account the positive wider societal and economic benefits of improved telecommunications. These are that telecommunications cables should be developed where appropriate, necessary and economically feasible, and the potential impact of inward investment in telecommunications cabling related manufacturing and deployment activity as well as the associated social and cultural benefits.
- Marine plan authorities will need to liaise, as appropriate, with terrestrial planning authorities to ensure the development of any necessary on-shore infrastructure is considered appropriately. This may be assisted through the future coastal concordat that is currently in development.

[339] Marine Management Organisation (2013) Strategic Scoping Report for marine planning in England, p116 www.marinemanagement.org.uk/marineplanning/key/ssr.htm
[340] Defra (2010) Marine Policy Statement, p41
[341] Department for Culture, Media and Sport www.gov.uk/government/publications/britains-superfast-broadband-future Accessed May 2013
[342] www.publications.parliament.uk/pa/cm201213/cmhansrd/cm130320/debtext/130320-0001.htm#13032055000001 Column 937
[343] Defra (2010) Marine Policy Statement, pp32-33 para 3.3.17

- Alongside this the development in the application of telecommunication cables and the increased technological advances in the capability and capacity of subsea cables generally.

Current policy

Arun district council[344] ,Eastleigh Borough Council[345]and West Dorset District Council[346] all have specific planning policies that mention or are explicit about telecommunications cabling that can relate to that area between low and high water mean springs (overlap of marine and terrestrial plans). Consideration should be given to these policies when developing South marine plans policies that relate to subsea cabling.

The GVA of the Telecoms and Communications sector for the whole of the UK is estimated to be £29.5 billion. Due to the unavailability of regional figures, or suitable apportioning data, it is not possible to provide a robust estimate for the GVA of the sector in the plan areas. It is clear, however, that the activity within the sector makes or facilitates a significant economic contribution to the plan areas and elsewhere within the UK[347].

The issue of connecting Round 3 wind farms to the grid has been considered by Ofgem and DECC within the Offshore Transmission Coordination Project. The project concluded that the most cost effective transmission network would be one which strategically coordinated transmission cables, rather than adopting a radial approach.[348] Alongside this the North Seas Countries' Offshore Grid Initiative (NSCOGI)[349] is working to support this approach.

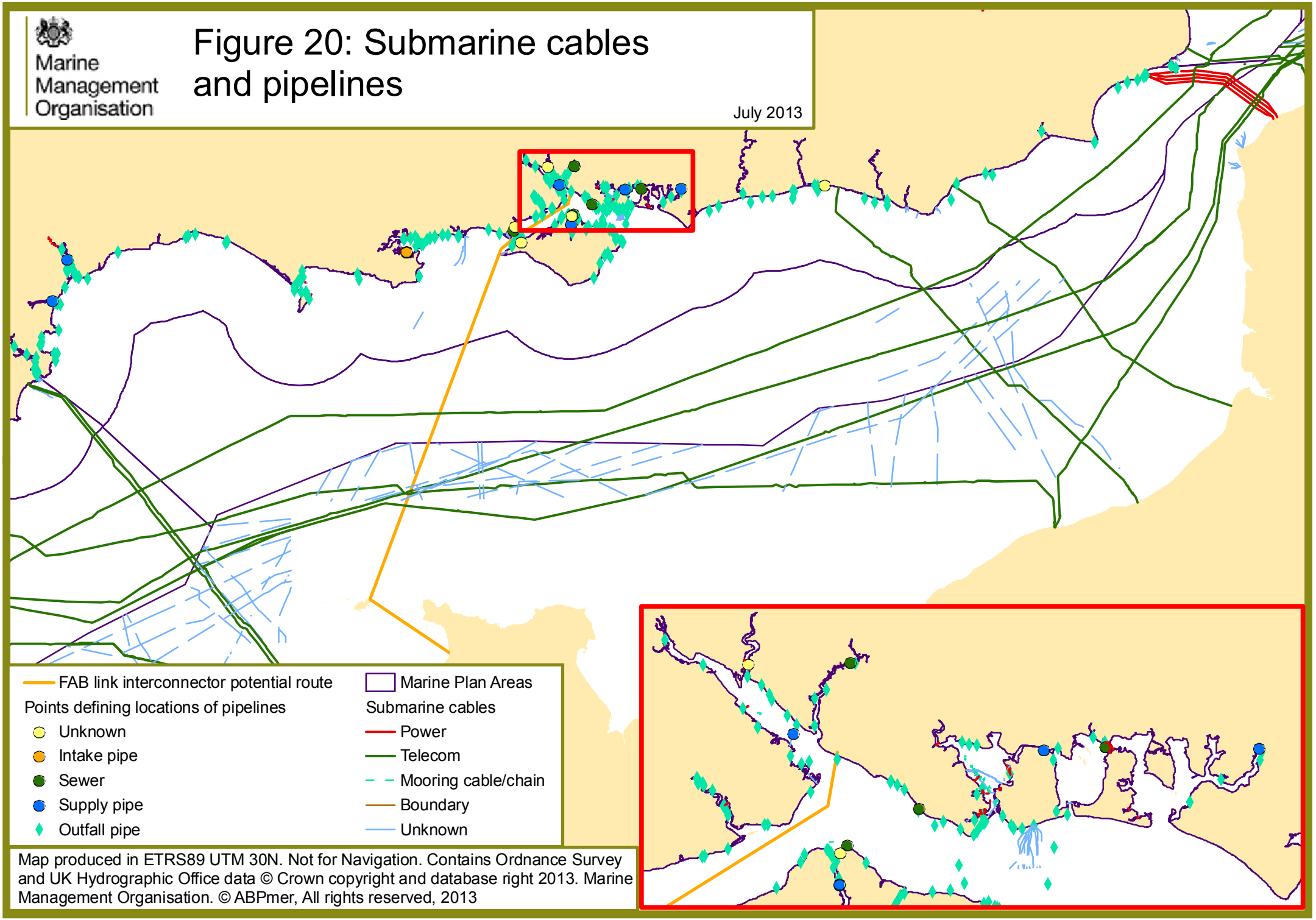
Activity in the South Marine Plan areas is limited. Two cables make landfall in the South inshore marine plan areas at Brighton and Bexhill. In addition Atlantic Crossing 1 runs along the seabed through the marine plan areas. There are also several cables between the Isle of Wight and the mainland.

[344] Arun district council draft local plan Policy DM4 www.arun.gov.uk/main.cfm?type=LOCALPLAN2&objectid=6221#ELP
[345] Eastleigh Borough Council draft local plan Policy DM8 www.eastleigh.gov.uk/planning--building-control/planning-policy--design/draft-local-plan.aspx
[346] West Dorset council local plan Policy IN7 www.dorsetforyou.com/media.jsp?mediaid=115502&filetype=pdf
[347] MMO (2013). Economic Baseline for the South Inshore and Offshore Marine Plan areas
[348] MMO (2013). Economic Baseline for the South Inshore and Offshore Marine Plan areas
[349] www.entsoe.eu/about-entso-e/working-committees/system-development/the-north-seas-countries-offshore-grid-initiative-nscogi/

Marine Management Organisation

Figure 20: Submarine cables and pipelines

July 2013



In order to maintain and repair cables in the South and South West marine plan areas there is significant cable related activity based at Portland. The majority of cable manufacturing and maintenance of vessels activity takes place here which is just inside the western limit of the South Inshore marine plan area.[350]

Future Trends

Any increase in cabling will be reliant on several factors:

a) number of offshore wind farm proposals and associated connections,
b) demand for telephony and internet connection as well as any increase in speed/data transmission requirements,
c) location and density of population in the areas that require this infrastructure.

In the last 30 years use of subsea cables for telephony and broadband has increased significantly[351] however there are no upcoming significant proposals for new infrastructure in the South marine plan areas. We must bear in mind that as the lifetime of cables tends to be 15-25 years some cables that are installed in the marine plan areas may require some redevelopment during the lifetime of the plans.[352]

Demand for additional capacity for new telecommunications cables is likely within the South marine plan areas due to the close proximity to France. Location of future cables is uncertain but will be based on the viability of appropriate landfall sites and space available for installation. It is likely that there will not be a significant increase in footprint of telecommunications cables due to the advances in the technology allowing more capacity from a similarly sized cable to that currently installed.[353]

Mitigation of climate change through more efficient transmission of electricity is something that National Grid have been considering in power cables that form part of the grid distribution, including mapping of impacts of cables in winter and summer and mitigation of these impacts.[354] There is potential that the power cable connecting the Isle of Wight may need to be replaced in the long term within the lifetime of the plan. Currently with the limited number of wind farms proposed in the South marine plan areas, some power cables will be necessary but not in great numbers.

Potential key issues

- It is important for marine planning to take account of appropriate locations for subsea cables, such as developments ???alongside other uses of marine space
- While there is anticipated growth in the number of subsea cables in the plan areas, it is difficult to quantify the amount and location of increase in cables.

[350] MMO (2013). Economic Baseline for the South Inshore and Offshore Marine Plan areas and anecdotal discussions with industry
[351] MMO (2013) South Marin Plan Futures Analysis
[352] MMO (2013). Economic Baseline for the South Inshore and Offshore Marine Plan areas and anecdotal discussions with industry
[353] MMO (2013) South Marin Plan Futures Analysis
[354] www.gov.uk/government/publications/adaptation-reporting-power-received-reports Climate Change Adaptation Report by National Grid Electricity Transmission plc September 2010 accessed June 2013

However where any emerging marine energy installation is proposed it is likely a cable will be required to connect it to the National Grid. Challenges arise in taking account of potential future sites in planning. Subsea cables UK have developed guidance on an approach to cable laying and separation distances in collaboration with The Crown Estate which supports application of a best practice approach to negotiating cable installation. [355]

- The United Nations Convention on Law of the Sea (UNCLOS) articles[356], especially 56, 58, 77, 78 and 79, allow for telecommunications cables to be laid at sea with limited reasonable constraints suggested by the sovereign state outside the 12 nautical mile limit in the Exclusive Economic Zone. Laying of cables beyond the 12 nautical mile[357] limit cannot be refused if the cable is international in nature, that is those that are passing through waters but not landing on the sovereign state. Marine planning will need to consider implications of any examples for the marine plan areas, and potential benefits of integration with other sectors[358]. The Ofgem report on offshore transmission coordination supports the financial benefits of having a joined up approach[359].

Interactions with other sectors

Interactions occur with numerous activities but particularly with the ports and shipping, aggregates and fishing sectors. Potential impacts are;

- disturbance to habitat during laying and maintenance of cables and assessment of impact of cable recovery prior to execution
- due to the risk of impact upon fishing, through snagging, aggregate extraction and shipping, exclusion of activities or mitigation measures for these activities need to be considered to ensure achievement of an appropriate risk appetite – these measures are usually dealt with at a project level
- technology improvements for fibre optic cables allow capacity per cable increases which could allow the industry to keep pace with demand without an exponential increase in the number of cables required
- the effect of power cables on the environment through scour and EMF (Electromotive Force) [360] output.

Issues for sustainability

Sustainability issues for subsea cabling are difficult to define. The Crown Estate are currently undertaking study that measures the Sustainability of UK Submarine telecommunications Cables and is due to publish later in 2013. The results of the study could inform any issues relating to sustainability for this sector.

[355] TCE (2012) Proximity Guidance www.thecrownestate.co.uk/tcform/TandCsDialog?f=%2fmedia%2f343985%2fSubsea+Cables+UK+Guideline+(SCUK)+No.+6.pdf&fn=Proximity+of+offshore+renewable+energy+installations+&+submarine+cable+infrastructure+in+UK+waters+guideline&m=1

[356] www.un.org/depts/los/convention_agreements/texts/unclos/UNCLOS-TOC.htm

[357] Also MCAA 81(2) also states we must grant consent within 12nm.

[358] Marine planning are liaising with National Grid for a useful dataset relating to landfall sites.

[359] www.ofgem.gov.uk/Networks/offtrans/pdc/pwg/OTCP/reports/Documents1/TNEI-7098-03-Asset%20Delivery%20Workstream-Release-15-12-2011.pdf, Section 2.8.3

[360] www.emfs.info/NR/rdonlyres/3DB6CCA2-854A-436B-B609-D89A09A978DF/0/EMF_The_Facts_120117.pdf, p7

Cumulative effects for cabling include the limitations in prescribing areas for landfall. The combination of shipping activity, fishing activity and other coastal uses and designations can limit appropriate areas for cables to come ashore as well areas for on land infrastructure such as converter stations for DC cables from offshore wind farms.

2.11 Fishing

The recently published marine planning strategic scoping report (SSR)[361] highlights the importance of the South marine plan areas for England's fishing industry as they land more fish (both in terms of tonnage and value) than any of the other marine plan areas. The MMO are responsible for the management of all quota stocks (and non quota stocks between 6-12nm), with non quota stocks between 0-6nm managed by the inshore fisheries and conservation authorities (IFCAs). Four IFCAs are involved in the management of the 0-6nm area: Kent and Essex IFCA between the east end of Rye bay and the northern boundary of Essex; Sussex IFCA for the whole of the Sussex coast; Southern IFCA for the entire Dorset, Hampshire and Isle of Wight coast and Devon and Severn IFCA which has two sea boundaries (the southern of which falls within the South marine plan areas from Lyme Regis to the border between Devon and Cornwall). The four organisations are responsible for fisheries management at a local level (including the establishment and enforcement of byelaws), together with conservation focussed activities supporting EU regulations/ directives such as Natura 2000. Their byelaws support the common fisheries policy (CFP), the revision of which comes into force on 1 January 2014 and will be applied by all parties managing the fishery. For the purposes of marine planning, fishing is considered to cover commercial fishing and the wider processing industry, with recreational angling addressed via the recreation section.

Understanding the nature and distribution of fishing activity in the South marine plan areas is a key priority for marine planning, yet there are still some areas where our understanding is limited. For example, it is necessary to consider multiple data sources to begin to understand fishing activity, such as vessel monitoring system (VMS) data for over 15m vessels (see figure 24), landings data from the MMO fishing activity database (FAD) (see figure 26), sightings data on inshore vessels from the IFCAs (see figure 25) and additional project data such as that collected to support the marine conservation zones projects. While VMS data shows activity to a high spatial resolution, it is limited to larger, over 15m vessels. In 2013 VMS will be introduced on over 12m vessels. There is currently a project ongoing within Defra to strengthen the available data for inshore vessels[362] and it is anticipated that the outputs of this project will assist the understanding of the distribution of smaller fishing vessels in the South. The growing use of iVMS for electronic reporting will offer additional opportunities to gain a greater understanding of where fishing activity takes place in the future.

[361] MMO (2013) Marine Planning Strategic Scoping Report (published summer 2013) http://www.marinemanagement.org.uk/marineplanning/key/ssr.htm

[362] Defra MB0117 'Understanding the distribution and trends in inshore fishing activities and the link to coastal communities'

Current Situation

In 2011, over 27,000 tonnes of fish were landed into ports in the South inshore plan area, with the five highest producing ports being Brixham, Shoreham, Portsmouth, Weymouth and Poole (by both tonnage and value) (see figure 21). 86% of the vessels whose home port is in the South inshore plan area are under 10m vessels, highlighting the important contribution smaller vessels make to the fishing industry in the South. Species targeted in the South marine plan areas include sole, cod, whiting, scallops, dogfish, conger eel, bass, ling and herring during the winter months (see figures 22 and 23). Shellfish also form an important part of the inshore fishery catches throughout the South marine plan areas, including species such as whelks, cuttlefish, crabs and lobsters. Specialist inshore fisheries in this region include dredge fisheries for oysters and various clams in the Solent and Poole Harbour[363].

A number of local development plans in the South have shown their support for a sustainable fishing industry, including the Chichester Harbour and South Devon AONB management plans, Teignbridge, Weymouth and Portland plans.

The total value of fish landed into ports in the South marine plan areas in 2011 was just over £51million (although it is important to remember firstly that fish landed within the ports in the plan areas may not necessarily be caught in the plan areas, and secondly that fish caught in the plan areas may be landed in ports outside them). There are 698 fishermen whose home port is in the South marine plan areas and earnings remain significant in the South due to the increasing value of fish[364].

There are also a further 1037 full time equivalents estimated to be working in the seafood processing sector[365]. It is estimated that there are 285 businesses associated with the fishing sector[366] in the South marine plan areas, with several coastal wards experiencing a relatively significant dependence on fishing, such as Brixham and Radipole (covering Weymouth), in which 23% and 13% of the workforce are dependent on fishing respectively[367].

Brixham harbour has recently experienced large scale regeneration[368], including a purpose built fish market which opened in March 2011 (representing an investment

[363] UKMMAS (2010) Charting Progress 2 Feeder Report: Productive Seas, Defra on behalf of UKMMAS, 2010, http://chartingprogress.defra.gov.uk/feeder/PSEG-feeder.pdf

[364] Draft report MMO: 1050 (2013) Economic baseline assessment of the South coast (due to be published summer 2013)

[365] MMO South marine plan areas economic baseline report- Based on the UK total employment in seafood processing (11,864) and apportioned to the marine plan areas based apportion factor quoted above for direct employment (8.7%).

[366] Department for Business Innovation & Skills (2012) Business Population Estimates for the UK and Regions, Published 17 October 2012. Available from: www.gov.uk/government/uploads/system/uploads/attachment_data/file/16402/bpe_2012_data.xls

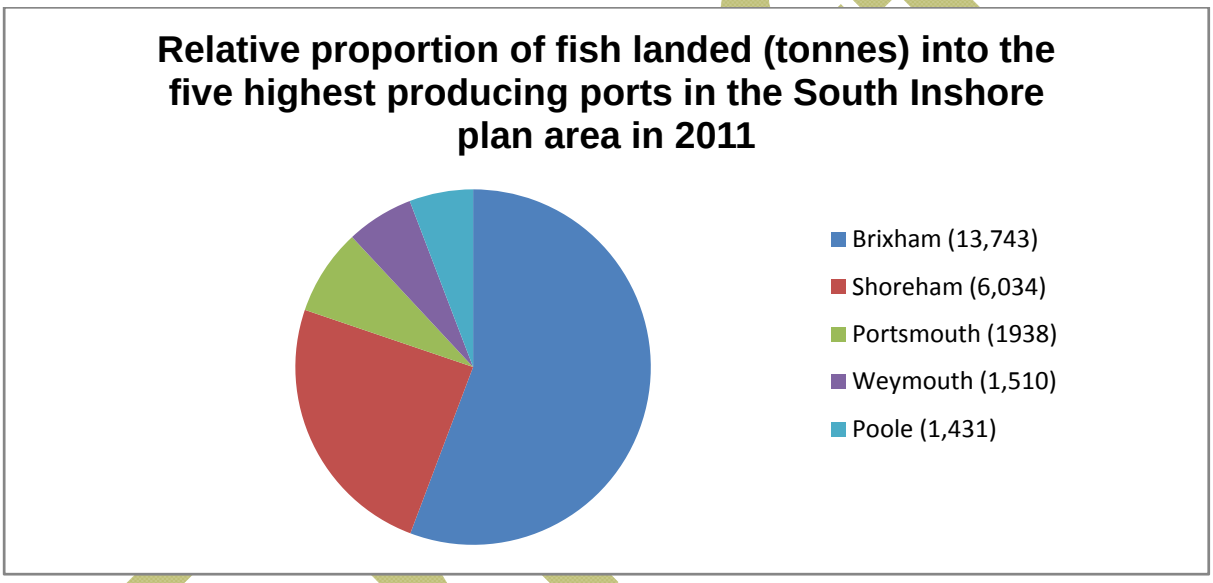
[367] Ekos Consulting (UK) Ltd. & Nautilus Consultants (2003) Socio-Economic Baseline Study of the South West Fishing Industry. Commissioned by PESCA and the South West Regional Development Agency.

[368] Defra (2011) 'A review of English fish markets', Part of the 'Fishing for the Markets' programme

of £20m)[369]. In addition, the town has also seen a small increase in fleet size in contrast to many other English ports.

Figure 24 highlights the significant presence of large international vessels that also fish in the South marine plan areas. Non-UK vessels in the South have historic rights to fish between 6nm and 12nm, with many non-UK over 15m vessels active outside of 12nm, such as the Dutch cutter fleet[370]. While much of the fish landed in the South inshore and South Offshore marine plan areas is sold in London where there is a high demand, niche markets that have developed more recently include whelks and West Country Crabs, which have found an export market in China[371]. Some of the larger boats operating in the South marine plan areas may land their catch in the Channel Islands or France.

Figure 21 Proportion of fish landed

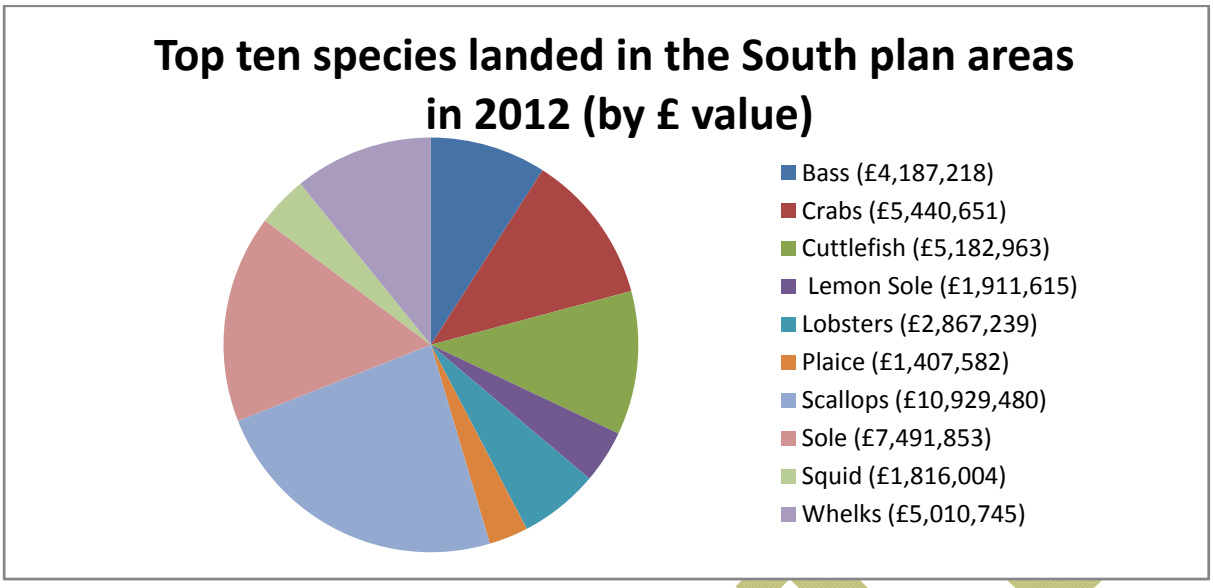


[369] Torbay Development Agency (2013) Brixham Fish Market. Accessed April 2013, www.torbaydevelopmentagency.co.uk/projects/brixham-projects/brixham-fish-market

[370] Finding Sanctuary, Irish Seas Conservation Zones, Net Gain and Balanced Seas (2012) Impact Assessment materials in support of the Regional Marine Conservation Zone Projects' Recommendations, pp33

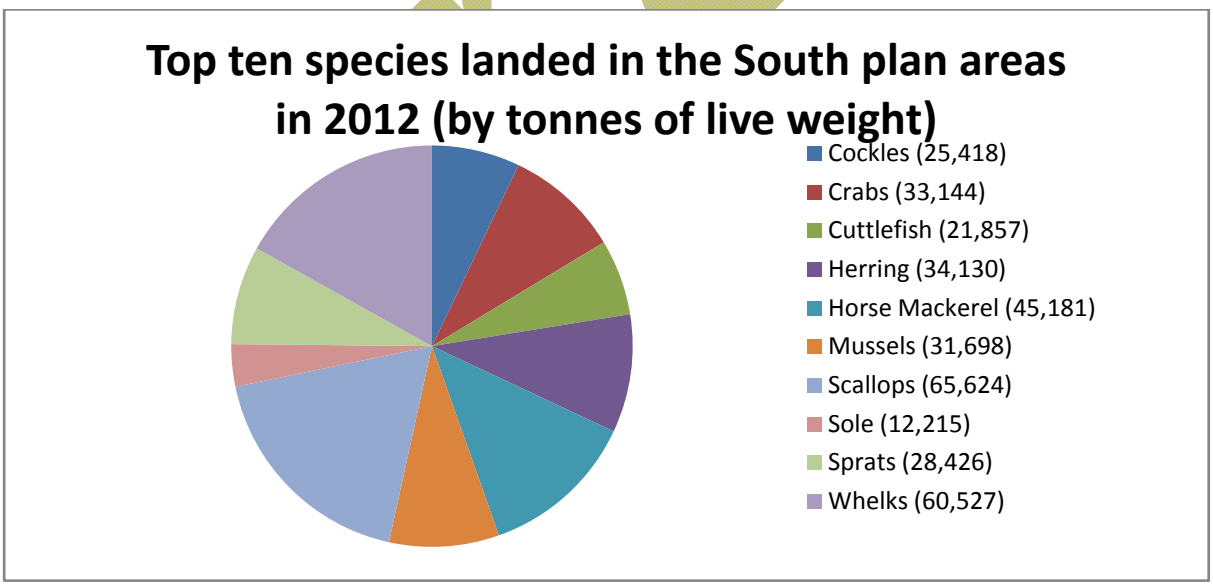
[371] Based on information provided by stakeholders at a MMO workshop held in London, 25th March 2013

Figure 22 Top ten species landed (£ value)



We show both tonnage and value due to the fluctuations in the value of catch landed.

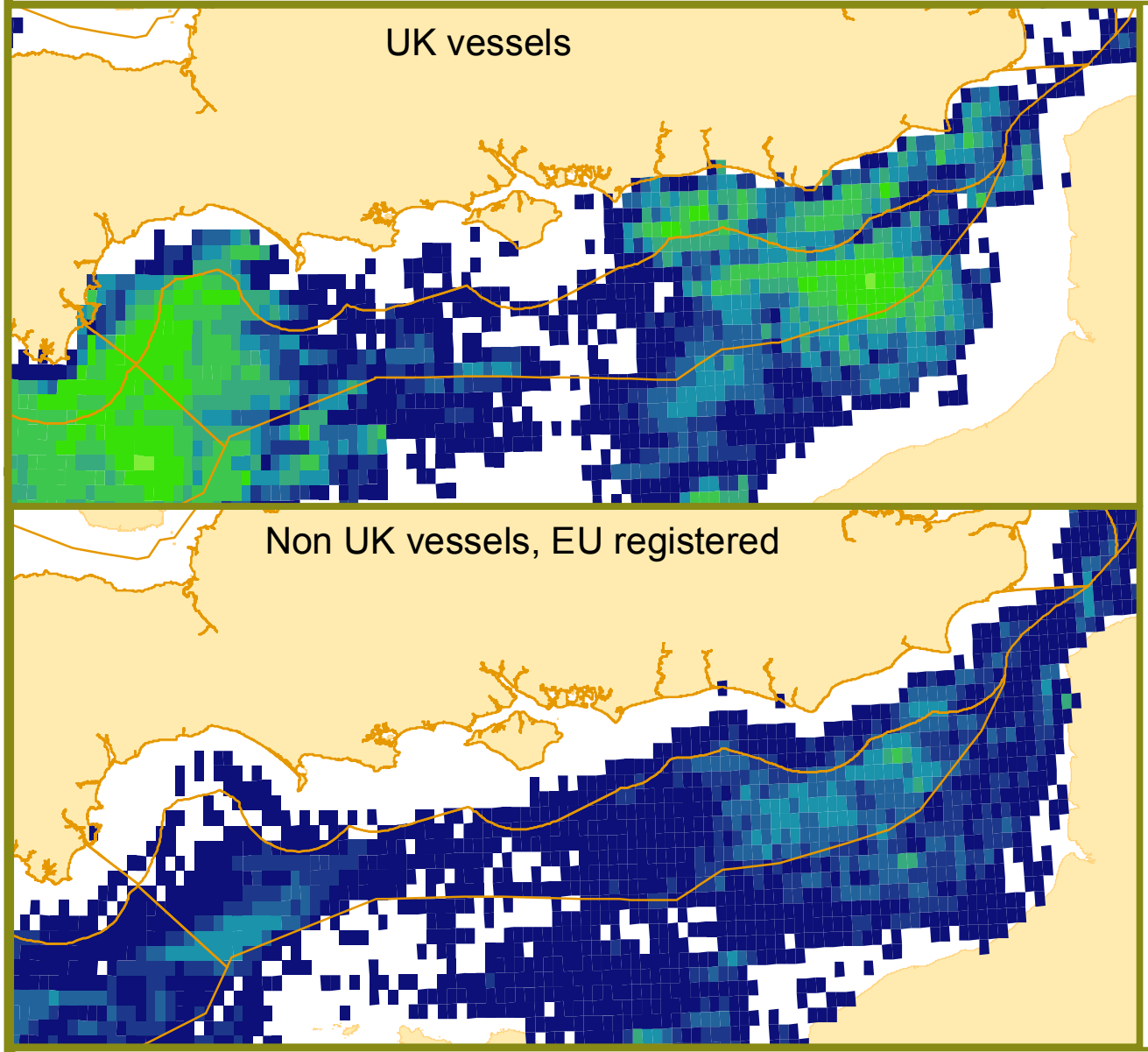
Figure 23 Top ten species landed (live weight)



Marine Management Organisation

Figure 24: Fishing effort for ≥15m UK and EU registered vessels 2007-2010 (time spent fishing in hours).

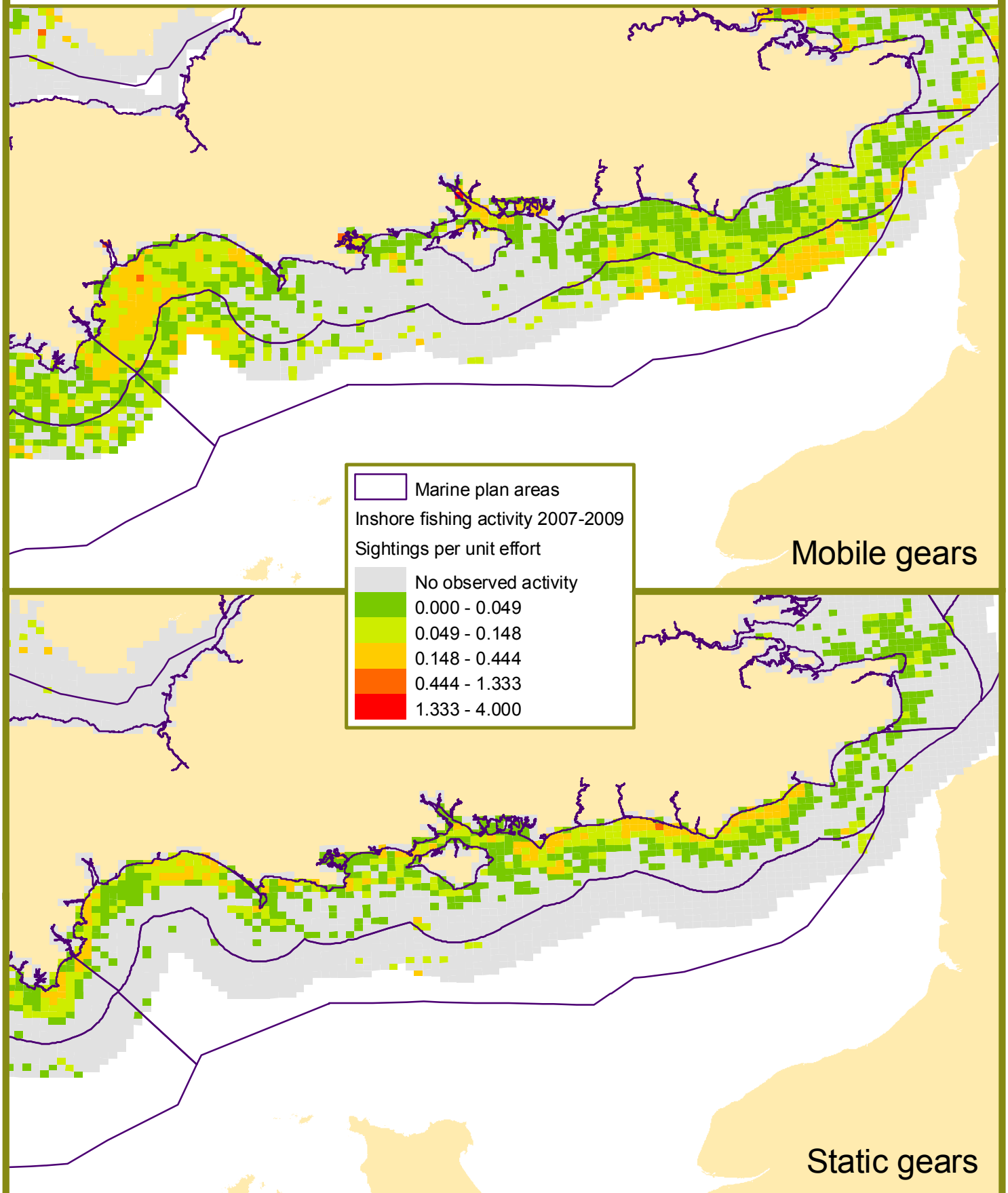
July 2013



Marine Management Organisation

Figure 25: Inshore fishing activity based on sightings from 2007-2009 (mobile and static gears)

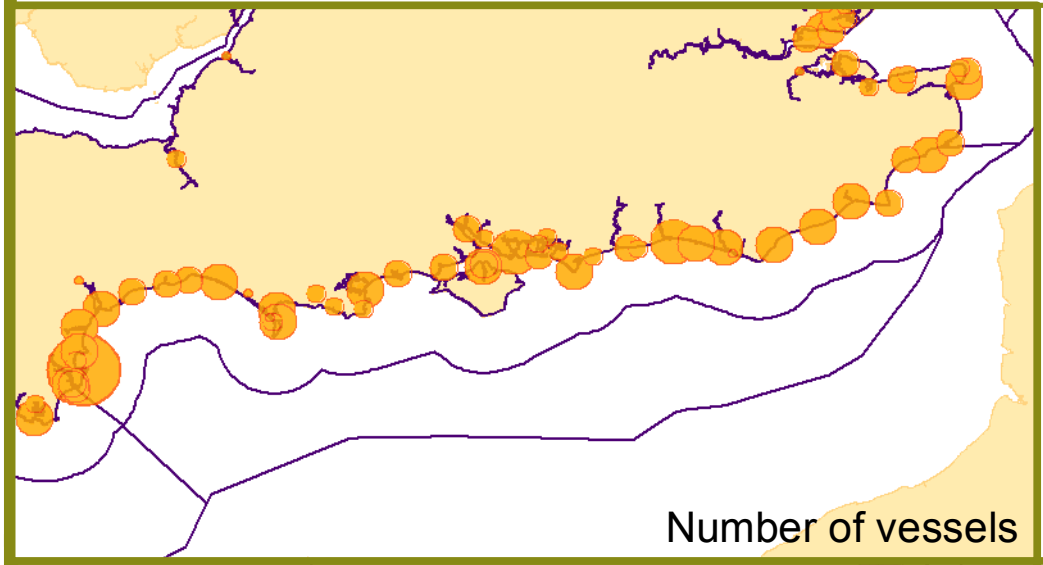
June 2013



Marine Management Organisation

Figure 26: Port fish landings in 2011 (all vessels)

July 2013



Port landings by No. of vessels (No. of vessels)

- 1 - 3
- 4 - 12
- 13 - 48
- 49 - 192
- 193 - 729
- 730 - 3,072

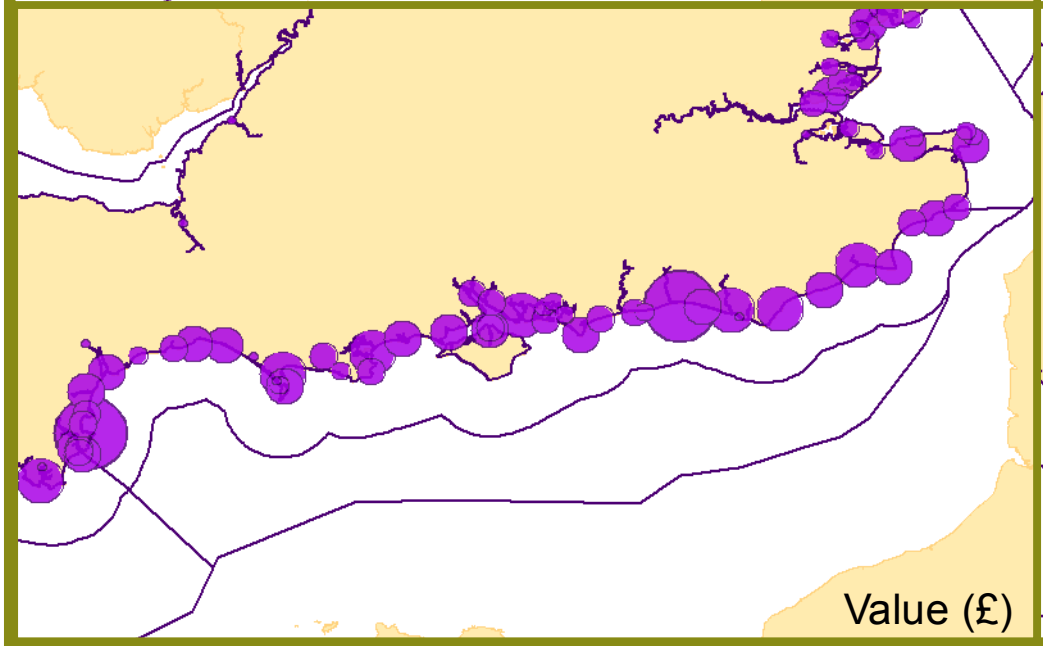
Port landings by value (£ Sterling)

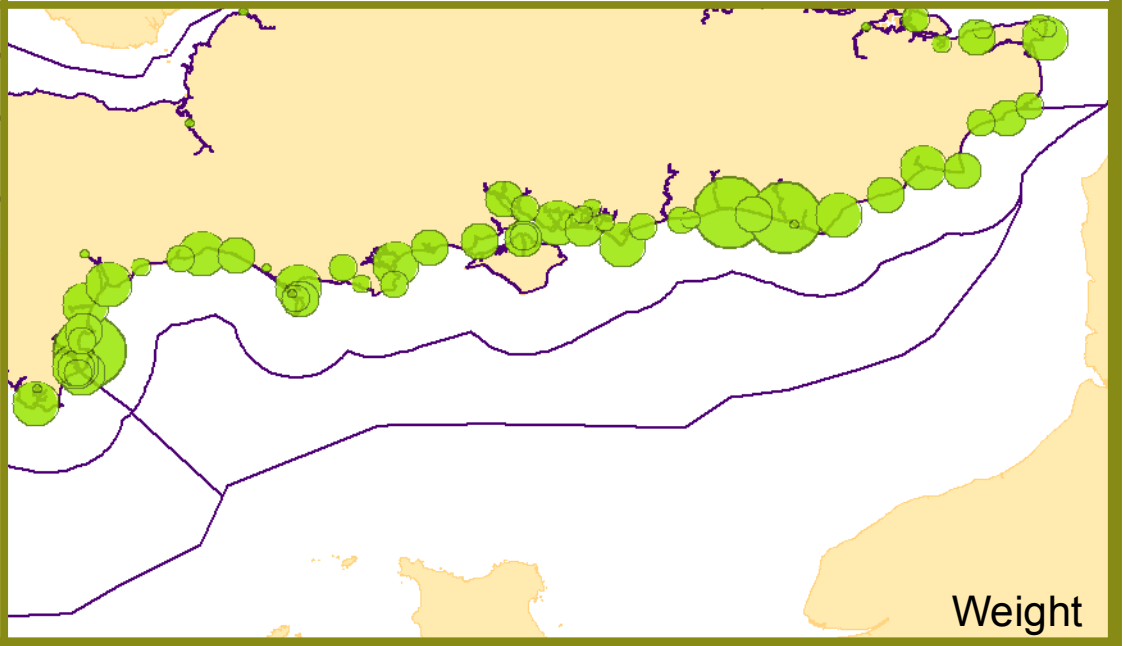
- > £0 - £7,000
- > £7,000 - £42,000
- > £42,000 - £252,000
- > £252,000 - £1,512,000
- > £1,512,000 - £9,072,000
- > £9,072,000 - £54,432,000

Port landings by weight (Tonnes)

- > 0 - 2
- > 2 - 12
- > 12 - 72
- > 72 - 432
- > 432 - 2,592
- > 2,592 - 15,552

Marine Plan areas





Future Trends

It is difficult to predict how fishing activity may change in the future, but changes are likely to be driven by the following key factors:

- changes to common fisheries policy (CFP) such as a ban on discards, maximum sustainable yield of quota stocks and regionalisation of fisheries management
- introduction of new marine protected area (MPA) management measures and measures to achieve good environmental status under the marine strategy framework directive (MSFD)
- the increasing use of the South marine plan areas by other activities including energy production
- increasing fuel costs
- climate change
- changes in stock levels

Other factors include the decreasing costs of fishing due to increased vessel efficiency, consumer taste (including an increase in the total consumption of fish, the consumption of under-utilised species, and increased consumption of fish under certification schemes such as Marine Stewardship Council), diversification of markets and possible habitat improvement under policy initiatives such as CFP and MSFD[372]. The recent legal ruling to re-allocate unused fish quotas to smaller vessels may also see a short term increase in the quantity of fish landed in the South due to the large number of smaller vessels there. Project Inshore[373] (which aims to achieve MSC accreditation for up to 200 stocks) has the potential to open up new marketing opportunities for the industry through customer support for sustainably caught seafood.

Potential key issues

One of the largest issues for the fishing sector is uncertainty and therefore a difficulty to forward-plan. Changes that may result from the CFP reform and the potential introduction of new MPA management measures are likely to affect the fishing industry, yet it remains unknown how and to what extent.

Potential displacement is also a key concern for fishermen, largely due to the growth in other sectors but also within the fishing sector itself through gear conflict (e.g. Lyme Bay). Fishermen are particularly concerned about the increased pressure on existing fishing grounds, particularly around the Isle of Wight where fishermen may be impacted by renewable energy production, aggregate extraction, ferry routes and new MPA management measures. In addition to direct effects on the industry, indirect effects such as possible impacts on tourism in active fishing ports such as Brixham and Hastings are a concern. There is also a possible issue regarding the effect of aggregate extraction on herring spawning grounds in the east of the offshore plan area[374]. Fishing has been associated with a number of environmental

[372] Draft report MMO: 1051 (2013) Future Trends in Fishing and Aquaculture in the South Inshore and Offshore plan areas (due to be published summer 2013)
[373] www.seafish.org/fishermen/fishing/project-inshore/
[374] The East Channel Association (2013) East English Channel Herring Spawning Assessment

pressures including abrasion and the removal of target species[375] and the UK as a whole is challenged with ensuring that fishing continues in a sustainable way.

In addition to economic and environmental impacts, such changes to the fishing industry have the potential to yield social impacts, both locally and on a wider scale. Recent studies have highlighted the importance of fishing to the identity and sense of place in Hastings[376] and the important contribution fishing makes to the character of towns such as Rye[377].

2.11 Aquaculture

Current situation

All current commercial aquaculture activity takes place within 1 nm of mean low water, within the South inshore marine plan area. In the South inshore plan area there are 34 designated shellfish waters (mainly of class B classification[378]) covering 520.8 km^2 or 5% of the inshore plan area, and 16 aquaculture businesses in operation within these waters[379]. The South inshore plan area currently holds 32% of all English aquaculture production, and by species is responsible for 33% of all mussel production and around 43% of all oyster production. In 2010 1338 tonnes of shellfish were produced via aquaculture, the majority from mussel farming. At present there is no finfish aquaculture within the South marine South plan areas[380]. There are various spatial concentrations of aquaculture production e.g. in the Solent, with mussels, oyster, clams, cockle and scallops all being cultivated.

The statutory bodies involved with aquaculture in England from a regulatory/leasing/licensing perspective include the Inshore Fisheries and Conservation Authorities (IFCA's), the Environment Agency (EA), Centre for Environment, Fisheries and Aquaculture Science (CEFAS), The Crown Estate and Natural England (NE). As of 2014 the Marine Management Organisation (MMO) may also be involved via the application of European Marine and Fisheries Funding (EMFF) to assist the growth of the industry.

[375] HM Government, 2012, Marine Strategy Part One: UK Initial Assessment and Good Environmental Status

[376] Urquhart, J. and T. Acott (2013). "Constructing 'The Stade': Fishers' and non-fishers' identity and place attachment in Hastings, south-east England." Marine Policy 37(0): 45-54.

[377] Reed, M., P. Courtney, et al. (2013). "Beyond fish as commodities: Understanding the socio-cultural role of inshore fisheries in England." Marine Policy 37(0): 62-68.

[378] CEFAS (2009-2013) Assorted Sanitary Reports covering estuaries in the Inshore South marine plan area. Produced under regulation (EC) 854/2004. www.cefas.defra.gov.uk/our-science/animal-health-and-food-safety/food-safety/sanitary-surveys/england-and-wales.aspx

[379] Personal communication with Kevin Denham, Head of the Fish Health Inspectorate, Cefas, May 2013

[380] Personal communication with Ian Laing, CEFAS, January 2013 – based on data CEFAS collate annually for Eurostat

Current Policy

There are numerous pieces of legislation related to the industry and these can make the regulatory process complex[381]. Recent national strategy and European legislation may help boost the industry. This includes the aquaculture consultation document[382] produced by English aquaculture industry bodies, which looked at the constraints to industry[383] and what was needed to assist growth of the sector. This included research into development capacity; research/trials and innovation regarding offshore aquaculture; increased access to investment; clarity on government bodies roles in the industry, streamlining of regulatory requirements, and inclusion in marine spatial planning. Legislation also includes the European Commission's Strategy for the Sustainable Development of European Aquaculture[384]. Common fisheries policy (CFP) reform has led to a more detailed inclusion of aquaculture in the CFP, in that the revised CFP foresees greater aquaculture infrastructure within the EU, and provides for the first aquaculture producer organisations via the common market organisations regulation. The commission established non-binding union strategy guidelines which look to reduce the administrative burden, encourage sustainable aquaculture, and facilitate access to growth[385].

Within the inshore South marine plan area there are a number of regulated aquaculture sites including a hybrid order in Poole Harbour[386]. Managed by Southern IFCA leasing 1.86km^2 to aquaculture businesses, it contains one of the area's largest pacific oyster farms and includes a bylaw that ensures 'any mussels relayed within the harbour must have come from within the southern IFCA's district'. In addition there are several orders within the Solent (for two companies managing and harvesting native oysters) and in Lyme Bay (mainly for mussel beds)[387].
Within local plans there is no direct mention of aquaculture; however it is indirectly referred to in the following plans under water quality and fisheries:

- Chichester Draft Local Plan Policy 13: Planning permission will be granted for development where the provision of water infrastructure is not considered detrimental to the water environment, including existing abstractions, river flows, water quality, fisheries, amenity or nature conservation.
- Worthing Local Development Framework Policy 15: The council will support the aims of the Water Framework Directive to protect and enhance the quality of the borough's surface freshwater areas, coastal waters and groundwaters.

[381] Defra (2012) Planning for sustainable growth in the English Aquaculture Industry, January 2012, available at www.gov.uk/government/consultations/planning-for-sustainable-growth-in-the-english-aquaculture-industry
[382] Planning for sustainable growth in the English aquaculture industry, Produced by the English Aquaculture Plan consultation Group, January 2012. www.gov.uk/government/uploads/system/uploads/attachment_data/file/82402/120112-aquaculture-consult-doc.pdf
[383] MMO (2013), South Marine Plan Futures Analysis, a report produced for the Marine Management Organisation by ABP Marine Environmental Research Ltd, MMO project no: 1039
[384] http://ec.europa.eu/fisheries/cfp/aquaculture/strategy/
[385] Basic Regulation on the CFP – Final Compromise Text, June 2013. http://cfp-reformwatch.eu/wp-content/uploads/2013/06/2013-06-14_Basic_regulation_on_the_CFP_final_compromise_text.pdf
[386] The Sea Fisheries (Shellfish) Act, 1967 introduced the concept of **Regulated** and **Several** fisheries whereby the common law right of shell fishing is removed to ensure the protection of property rights in such fisheries. Hybrid orders which are regulating orders with powers to grant leases of Several rights. www.cefas.co.uk/publications/techrep/techrep136.pdf for more information on Orders.
[387] Information obtained during bilateral meeting with Southern IFCA officers in June 2013.

In addition there is the Poole Harbour Aquatic Management Plan which contains sections on aquaculture; and various local studies into shellfish including the possibility that mussel farming in the Exe may be aggravating shifting sands in the estuary.

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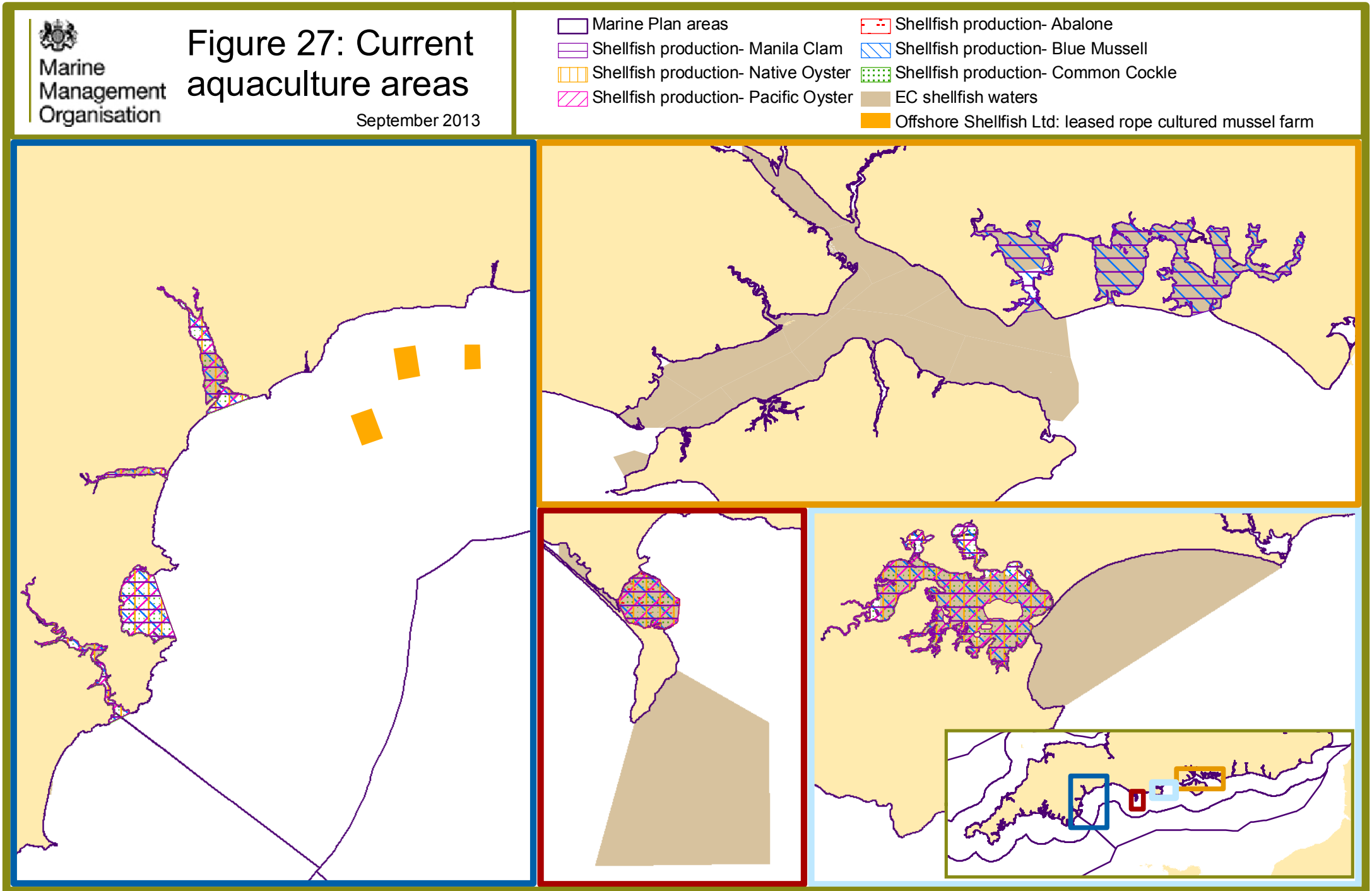
Figure 27: Current aquaculture areas

September 2013



Value

In 2009 estimated economic value of shellfish production in England was £7.16 million[388]. The GVA of the aquaculture sector was estimated to be £2,980,000, which equated to £741,000 for the South marine plan areas[389]. Within the South marine plan areas there are 42 known direct employees, with another 104 people indirectly employed in supporting industries[390]. Future development levels are difficult to predict due to the close linkages with changes in wild fisheries, market forces, and the recent instability in economic growth rates[391]. The following types of aquaculture have been identified[392] as having the greatest annual net profit within current technology limitations: lobster hatcheries/restocking, and mixed trestle/bag culture of oyster. Based on current technology 855km^2 of the South marine plan areas are seen as potentially suitable for aquaculture activities[393].

Table 8: Breakdown of area by aquaculture type

855km² within the South marine plan areas have been deemed as suitable for one or more species of aquaculture, based on current technology. This can be broken down by species as follows:

Aquaculture type	Area (km^2)	% of total area
Bottom Culture (Clams)	4	<1
Rope Grown (mussels)	172	20
Lobster Restocking	601	70
Macro Algae	188	22
Trestle Bag Bivalve	23	3
Fin Fish	102	12
Bottom Culture (Oysters)	0.2	<1

[388] Defra (2012) Planning for sustainable growth in the English Aquaculture Industry {and inflated to 2013/14 values), January 2012, available at www.gov.uk/government/consultations/planning-for-sustainable-growth-in-the-english-aquaculture-industry

[389] MMO (2013), Economic Baseline Assessment of the South Coast, A report produced for the Marine Management organisation by Eunomia Research and Consulting. MMO project no:1050

[390] Personal Communication with Kevin Denham, Head of the Fish Health Inspectorate, Cefas, May 2013 and Using a multiplier derived from Food and Agriculture Organization of the United Nations, National Aquaculture Sector Overview - Canada, Accessed 16th May 2013, www.fao.org/fishery/countrysector/naso_canada/en

[391] MMO (2013), Economic Baseline Assessment of the South Coast, A report produced for the Marine Management organisation by Eunomia Research and Consulting. MMO project no:1050

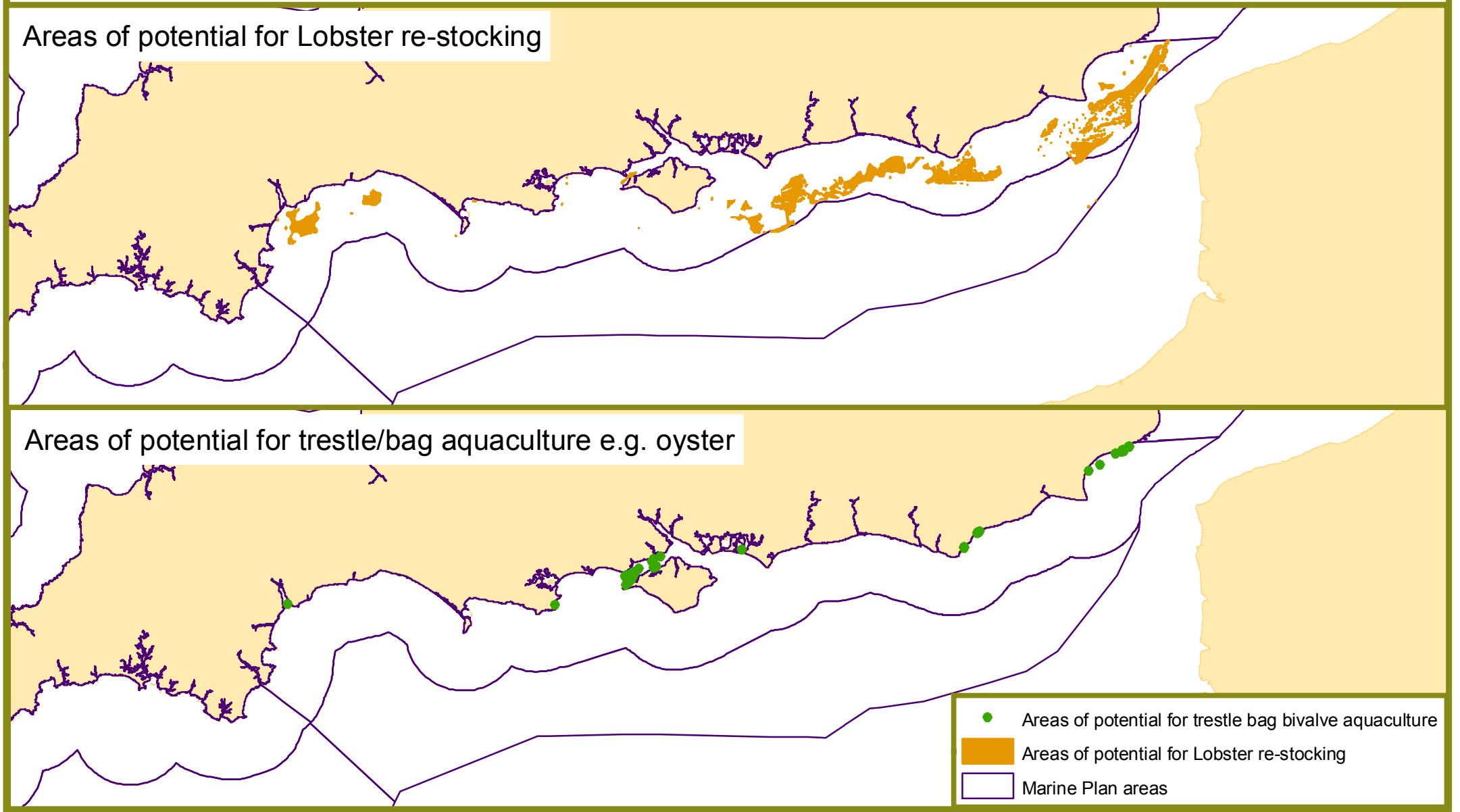
[392] MMO (2013) 'Spatial Trends in Aquaculture Potential in the South and East Coast Inshore and Offshore Marine Plan Areas' a report produced for the Marine Management Organisation by Marine Planning Consultants. Project no: 1040

[393] Calculated by Ruth Barber of MMO, August 2013, baseline information taken from MMO (2013) 'Spatial Trends in Aquaculture Potential in the South and East Coast Inshore and Offshore Marine Plan Areas' a report produced for the Marine Management Organisation by Marine Planning Consultants. Project no: 1040

Marine Management Organisation

Figure 28: Aquaculture potential based on current technology for most profitable aquaculture types based on annual net profit

July 2013



- Water quality is of high importance to the aquaculture industry. Poor water quality can lead to reduced species growth and increased risk of disease, both to the shellfish and to humans via consumption[394].
- As such, sustainable shellfish cultivation on the south coast depends on co-operation with others including water companies, who deliver major capital schemes to improve coastal water quality under the requirements of the Water Framework Directive[395].
- Relationship building and understanding between aquaculture businesses and recreational boating would benefit both, as within the South Inshore marine plan area aquaculture occurs in estuaries alongside recreational boating and yacht racing. Examples of such integration occur within the Solent where pleasure boating occurs alongside important oyster beds.
- Maintenance/capital dredging, port and shipping activities, oil refining, and capture fisheries also occur close to aquaculture activities. These may be a source of conflict for space, but the more immediate concern is water contamination by bacteria, viruses, and chemical pollution, and impacts from non-native species e.g. from ballast water. Faecal contamination from large concentrations of breeding/overwintering birds may also be an issue[396].
- The Crown Estate believes that regulatory bodies should look to co-location of aquaculture with other marine interests, most notably capture fisheries[397]. The idea is that land based infrastructure for the two industries is similar, with many transferable skills, meaning there is scope for positive interactions between the sectors. Relationship building with capture fisheries are key; the fisheries sector needs to see aquaculture as complementary not as a direct competitor.

Future trends

Although there is a desire to develop the aquaculture industry, recent slowing of economic growth among other factors means that it is difficult to predict future expansion[398]. Such development could include a movement of aquaculture offshore, co-location with other activities, and the cultivation of new species. Outside of factors covered elsewhere (e.g. market forces), key factors that could drive changes in the industry include: co-location opportunities with offshore wind/offshore potential for shellfish farming; climate change; marine biomass production. Technological development may also influence industry growth offshore, but is currently out of the scope of this report.

Within offshore windfarm sites the specific infrastructure and environmental conditions will determine the type of aquaculture that could be undertaken. The culture of shellfish such as mussels within wind farm infrastructure has been shown

[394] East Inshore and Offshore Marine plan Areas Evidence and Issues Report 2012 (MMO)
[395] Link to WFD legislation http://ec.europa.eu/environment/water/water-framework/index_en.html
[396] CEFAS (2009-2013) Assorted Sanitary Reports covering estuaries in the Inshore South marine plan area. Produced under regulation (EC) 854/2004. www.cefas.defra.gov.uk/our-science/animal-health-and-food-safety/food-safety/sanitary-surveys/england-and-wales.aspx
[397] Pers. comms. Alex Adrian The Crown Estate 2013 and 'UK Offshore Aquaculture Prospects A Crown Estate Perspective', presentation given at UK Aquaculture forum Oct 2012
[398] UKMMAS (2010) Charting Progress 2. Feeder Report: Productive Seas, Defra on behalf of UKMMAS, 2010, http://chartingprogress.defra.gov.uk/feeder/PSEG-feeder.pdf

to be biologically and economically feasible[399]. A project undertaken in Wales at North Hoyle Wind Farm by the Shellfish Association of Great Britain, Seafish and Deepdock Ltd[400] cultivated mussels on the seabed within the wind farm with promising results. This project is linked to studies funded by European Fisheries Fund Wales[401], which intend to help raise developer confidence by increasing knowledge of environmental and economic potential for cultivation offshore.

Current developments in the South marine plan area which are looking to expand the industry include the 15 year lease obtained by Offshore Shellfish Ltd to create the UK's first large scale offshore rope cultured mussel farm in Lyme Bay. It is expected to employ up to 30 people and produce up to 10,000 tonnes of mussels annually[402]. The farms are to be situated between 3nm-6nm offshore at 20-24m depth. The farms have the potential to increase production of mussels in the plan areas substantially[403].

Potential key issues

Climate change could have major impacts for the sector, particularly shellfish aquaculture, due to the effects of rising water temperatures and changes in plankton composition[404]. Rising water temperature could induce faster growth rates in warm water species, but could adversely affect cold water species or those grown in intertidal areas. Higher water temperatures could also allow for novel species such as tilapia and seabass to be farmed. Increased storm frequency may impact the equipment required to keep stock secure, and ocean acidification could affect the calcifying processes of commonly cultured shellfish species including mussels[405].

Marine biomass (the cultivation of macro-algae) is emerging as one of the newest prospective business sectors but has yet to develop into a full demonstration phase. Research and development is however well established in identifying resource potential.

[399] MMO (2013) Evaluation of the potential for co-location of activities in marine plan areas, A report produced for the Marine Management Organisation pp98 MMO project report no: 1010
[400] www.shellfish.org.uk/files/7599EFF%20Co-Location%20Project%20December%202012%20Meeting%20Report%20FINAL.pdf
[401] www.shellfish.org.uk/files/7599EFF%20Co-Location%20Project%20December%202012%20Meeting%20Report%20FINAL.pdf
[402] MMO (2013), Economic Baseline Assessment of the South Coast, A report produced for the Marine Management organisation by Eunomia Research and Consulting.
[403] 'UK Offshore Aquaculture Prospects A Crown Estate Perspective', presentation given at UK Aquaculture forum Oct 2012
[404] MMO (2013), Economic Baseline Assessment of the South Coast, A report produced for the Marine Management organisation by Eunomia Research and Consulting.
[405] Pinneger J, Watt T, Kennedy K (2012) Climate Change Risk Assessment for the Marine and Fisheries sector. (Defra)

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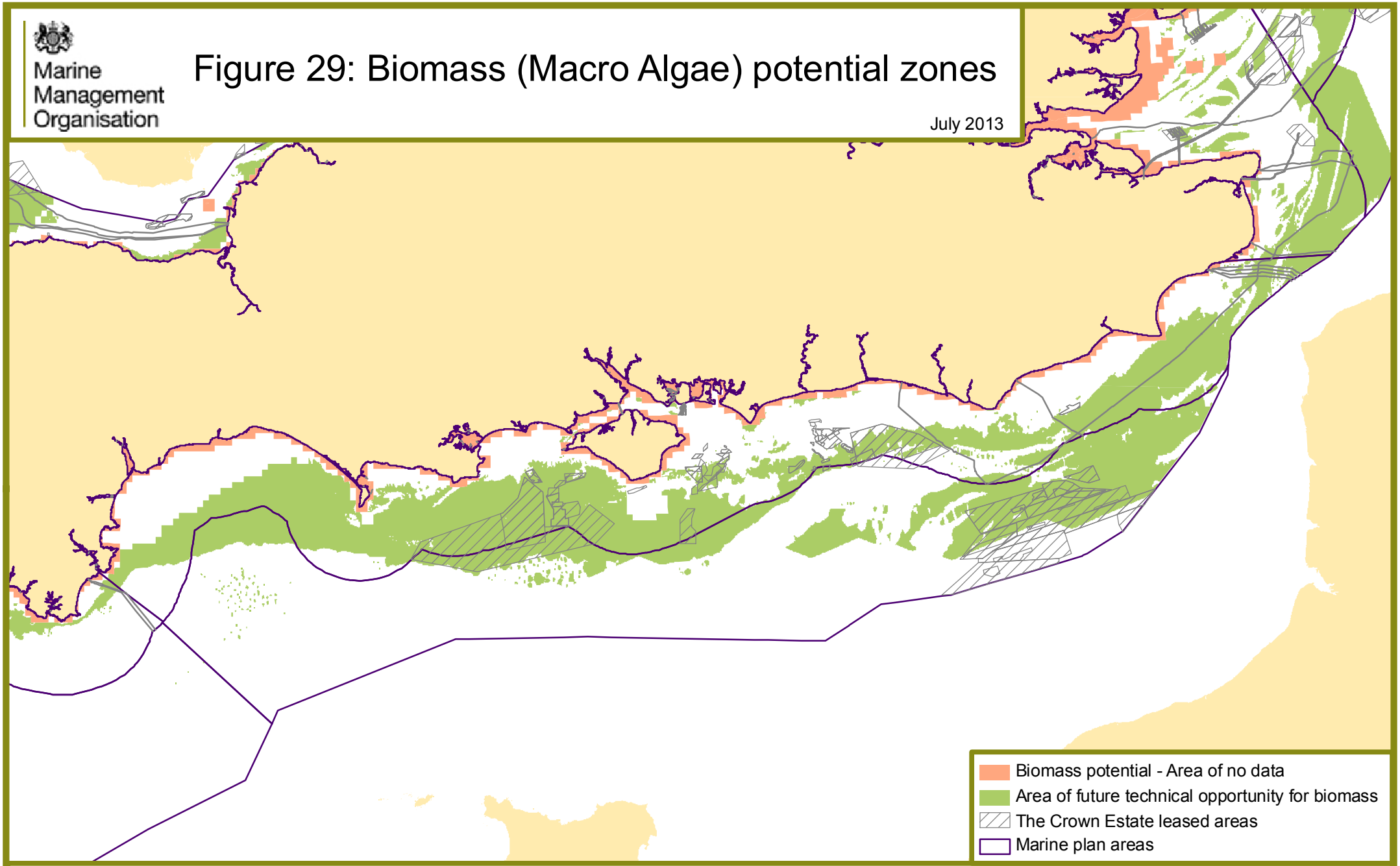
Figure 29: Biomass (Macro Algae) potential zones

July 2013



Note: The areas of future technical opportunity do not include the presence of hard constraints posed by existing uses of the marine estate or other factors including natural & cultural resources, marine users, economics & market appetite and policy drivers required for the opportunity to be supported. Cables and pipelines outside of the territorial waters limit (other than export cables) are not shown as they are not subject to The Crown Estate's permission

Marine biomass has potential space and ecosystem implications for the South coast marine plan area in the future. The Crown Estate and CEFAS are currently carrying out ecosystem effects modelling in Scotland[406]. Additionally there are projects occurring in Norwegian and Irish waters, and Statoil has plans for a 2000ha project by 2015 and a 10,000ha one by 2020 near Bergen[407]. It is important to note that macro-algae have other uses outside of biomass, including for food (human and animal feed), fertiliser[408], and pharmaceuticals. Although the current focus is on biogas production, the pure aquaculture side of cultivating algae could contribute to other industries in the future.

Issues for sustainability

- aquaculture is often seen as a way to contribute to meeting the rising demand for seafood alongside wild capture fisheries
- expansion of the aquaculture industry is likely to lead to increased jobs in coastal communities at various skill levels, especially if joined up with the capture fisheries sector
- for established forms of aquaculture the science behind these (e.g. best practice, species environmental requirements) requires collating
- for novel/emerging forms, including offshore potential, investment is needed to look at environmental impact and production technology
- for all aquaculture types more research is required into economic/social benefits. The MMO have already begun this via MMO project 1035 'Social impacts of fisheries, aquaculture, recreation and tourism, and marine protected areas (MPAs) in marine plan areas in England'. This project is currently ongoing

2.13 Tourism

Tourism can be defined as the activities of persons travelling to and staying in places outside their usual environment, as described by the World Tourism Organisation[409]. There are certain features and attractions which draw more people to the coast, including heritage coasts, coastal paths, marine recreational opportunities, seaside towns and visitor attractions.

Recreation can be defined as activities carried out by local residents who regularly participate in a particular type of recreation, or by those visiting the area, or marine recreational activities are one type of attraction that will draw people to an area.

Current Situation

The South marine plan area is a popular tourist destination with a large number of seaside towns and attractions. The eastern half of the coastline is highly accessible

[406] Aldridge, J., van de Molen, J. and Forster, R. 2012. 'Wider ecological implications of Macroalgae cultivation', The Crown Estate, 95 pages. ISBN: 978-1-906410-38-4

[407] The Crown Estate futures supporting text, 2013, provided to the MMO via personal communication
[408] Biomara: www.biomara.org/understanding-seaweed/the-importance-of-seaweed-across-the-ages
[409] This definition has been adopted by the UK Government.

to London and the Southeast. The western part sits within the South West region which has the largest share of the UK domestic tourism market[410].

Torquay, Weymouth, Bournemouth, Isle of Wight and Brighton and Hove have a higher combined holiday spend than any other marine plan area in England demonstrating its importance for tourism[411].

Wildlife and natural landscapes attract many visitors to the plan areas. Key destinations include the South Downs National Park (which stretches for 140 kilometres from Winchester to Eastbourne) and the South Devon, East Devon, Dorset, High Weald, Isle of Wight and Kent Downs areas of outstanding natural beauty[412]. Other designations include sites of special scientific interest and national nature reserves. Many of these marine environments are protected as special areas of conservation and special protection areas[413].

The South coast is host to a variety of wildlife watching activities with tourists hoping to see (among other species): whales, dolphins, basking sharks, seals and waterbirds. This is done from either boat or onshore. Most of the boat-based wildlife watching is focused between the coastline of the river Dart and Berry Head, Devon. Wildlife watching is also popular along the Jurassic Coast, Portland Bill and the Isle of Purbeck as well as natural harbours such as Poole[414].

The Jurassic Coast, England's only natural World Heritage site (located along the Dorset and East Devon coast), receives over 5 million visitors each year.[415] Other major natural heritage attractions include Berry Head (Devon), Lulworth Cove and Durdle Door (Dorset), The Needles (Isle of Wight), Seven Sisters, Beachy Head (Sussex) and Dungeness (Kent). There are 22 blue flag beaches and 44 beaches presented with seaside awards across the South, attracting people to the area[416].

Notable economic activities in the plan areas also include the cruise industry and the conference trade.

Cheap foreign holidays and budget airlines have contributed towards a reduction in traditional seaside holidays in the UK over the last 15 years.[417] However, since the economic downturn and through improved publicity, domestic holidays have increased by approximately 40% in 2011[418]. In particular 'staycation' (where people stay at home, but undertake recreational activities within driving or easy local travel distance) style holidays have grown in popularity in recent years. Holiday goers are

[410] MMO (2013) Compilation of information on tourism relevant to marine planning in the south inshore and offshore marine areas, final report, April 2013, a report by Atkins for the MMO
[411] Reference the social impacts research currently being carried out, MMO 2013.
[412] MMO (2013). Economic Baseline for the South Inshore and Offshore Marine Plan areas
[413] MMO (2013). Economic Baseline for the South Inshore and Offshore Marine Plan areas
[414] MMO (2013). South Marine Plan Areas Futures Analysis. MMO Project No: 1039
[415] Fisher Associates (2011) Jurassic Coast World Heritage site waterborne Transport Study, a report prepared by Fisher Associates for Dorset AONB, June 2011
[416] Not all local authorities apply for blue flag beach awards and there are other awards such as the Marine Conservation Society good beach guide available .
[417] Adams Henry consulting ltd 2007; Beatty et al, 2010)
[418] Penrose, 2011

starting to demand more natural and authentic vacations, in coastal settings often described as untouched, rather than in the traditional larger seaside resorts.

The majority of local authorities in the plan area have local development framework and local plan policies related to tourism with an emphasis on sustainable development. This includes promoting tourism development in existing urban areas and centres so as to protect natural environmental assets, landscape character, and social heritage of an area, for example Portland Bill and Poole harbour. Growth sectors such as green tourism are actively encouraged. Coastal regeneration has also been identified by many authorities (for example Eastbourne) and is considered a priority in the south which includes the desire to reduce seasonality of employment related to tourism.

Future Trends

A recent study looking into future trends of different marine sectors[419] indicated a number of drivers which will influence the future direction of tourism:

- Uncertainties surrounding the potential magnitude and rate of expected climate change impacts on tourism. Milder weather and a longer summer season predicted under some scenarios could increase visitor number, however wetter weather and increased storms could also deter visitors.
- The growth of the tourism market is heavily dependent on the general health of the UK and global economy. Investment in new, as well as updating existing, facilities is likely to encourage tourism and may cause redistribution in tourism numbers among existing locations

Potential key issues

- Issues of coastal erosion around the Isle of Wight and Hastings may impact on the tourism offer. Climate change is predicted to increase coastal flooding and erosion through sea level rise and an increase in extreme events
- Some seaside towns are in decline and need regeneration and investment
- The cruise market in Southampton does not offer much in the way of benefits to the local area as most of those who arrive in go straight to London. Similarly food and drink purchases are low because of availability of this on board the ships
- Maintenance of access to the coast for tourism and recreational users
- Potential conflicts in promotion of tourism in seaside locations, including growing the jobs market and visitor numbers, and maintaining natural environmental assets at the same time
- There may be potential conflicts between tourism and recreation such as multiple beach users and demand for space.

Interactions with other sectors

- Consenting of wind farms, tidal energy schemes and associated port development could impact on tourism in certain areas i.e. Navitus Bay, Rampion and St Catherine's Point

[419] MMO (2013). South marine plan areas futures analysis.

- The health of the marine environment, especially the water quality, is very important to tourism and recreation (see section on recreation and on water quality)

Issues for sustainability

- Development of tourism opportunities, both in terms of new infrastructure and an increase in footfall in rural areas, may adversely affect the environment by changing the landscape and character of an area and potentially harming or disturbing species and habitats. General encouragement sought for tourism infrastructure to be concentrated in existing towns and urban areas, where visitors can stay and travel to and from rural areas
- Growth in visitor numbers may impact positively on the economy, but negatively on the environment
- Climate change – different predictions could be more or less positive for tourism, for example warmer weather may encourage more people to holiday in the area, however, extreme weather events may have the opposite effect and cause tourists to holiday elsewhere.

2.14 Recreation

The sea provides a range of recreational opportunities which creates jobs for local people, generates income for the economy, supports quality of life and provides health and well being benefits[420]. Furthermore, these recreational activities, and the businesses that rely on them for their livelihoods, can be enhanced by a well-managed, attractive and healthy marine environment.

Current Situation

The South marine plan areas have a high recreational value [421] and are very popular for undertaking recreational activities including pleasure boating, sailing, recreational diving (including diving on wrecks), sea angling, kayaking, surfing and windsurfing and exploration of underwater and coastal heritage assets[422]. There are also many blue flag beaches (Figure 30) and popular rural beaches such as Studland beach in Dorset which receives one million visitors each year[423].

The marine recreation sector is inherently linked with tourism (see 2.12); many people visit the area to try a new recreational activity or to simply walk on the beach (a form of recreation) and enjoy the surrounding views. Furthermore, there are many marine and coastal designations in the South Inshore plan area (including national parks, Areas of Outstanding Natural Beauty (AONBs) and the Jurassic Coast World Heritage Site – see 2.14) which attract visitors to the area.

The majority of local authorities adjacent to the South Inshore plan area recognise the importance of recreation to the economy and this is reflected in their local

[420] Defra (2010) Marine Policy Statement, page 46
[421] Decision on selection of third and fourth marine areas for plan production (2012). MMO.
[422] Water sports participation study (2011). British Marine Federation.
[423] Fisher Associates, 2011. Jurassic Coast World Heritage Site Waterborne Transport Study.

development frameworks (LDFs). 34 local authorities have policies in their core strategies relating to tourism and recreation (most referencing the marine and coastal environment) which generally focus on (but are not limited to):

- Development (i.e. harbour or marina) and regeneration of the seafront to attract visitors and create new jobs and income for the local communities
- Encouragement of opportunities to diversify (in terms of the activities or the season) the visitor economy, but not at the detriment of existing opportunities
- The importance of access to the coastline and the sea, this includes both access to coastal areas and physical access to the sea through the provision of slipways, footpaths, moorings
- The balance between increasing the visitor economy (and recognising the significant contribution it makes to the economy and local communities) while managing the impacts of tourism and recreation on the coastline, especially designated areas which are often the reason people choose to visit an area
- The management of recreational activity and the reduction of any disturbance it causes to the natural environment, this is expressed in the policies of area of outstanding natural beauty (AONB) management plans
- Eight local authorities specifically mention sailing/boating in their policies with regards to making suitable provision and ensuring this activity can continue sustainably

Leisure boating is the most popular and economically valuable part of the marine water sports industry. The greatest density of Royal Yachting Association (RYA) clubs and leisure marinas in the UK lie adjacent to the South Inshore marine plan area[424] and the Solent and Isle of Wight are some of the most popular recreational boating areas in the UK (see Figure 31). Sailing is also undertaken in Shoreham, Brighton and Poole Harbour and the development of the Weymouth and Portland National Sailing Academy (an Olympics 2012 legacy) has increased sailing activity in the area.

There are many international sailing and boating events in the South marine plan areas such as Cowes week, Round the Island race and Southampton Boat Show. These generate revenue for the local economy and attract tourists to the area. For example, approximately £6.4million income is generated for local businesses through tourism expenditure during Cowes week[425].

Weymouth and Portland are also popular diving sites due to the large number of wrecks and reefs, along with Torbay, Selsey and the Isle of Purbeck.

The South marine plan areas are some of the most popular stretches of coastline for windsurfing and kite surfing despite the optimum conditions being infrequent compared to other marine plan areas[426]. Popular sites include Poole Bay, Brighton, Bournemouth, Eastbourne, Hayling Island and Langstone Harbour.

Paddle sports (canoeing, sea kayaking, stand-up paddle boarding) occur predominantly inshore at locations such as Poole Harbour, Studland Bay, the Dart

[424] BMF (2007). Economic benefits of Coastal marinas UK and Channel Islands Full Report.
[425] MMO (2013). Economic Baseline for the South Inshore and Offshore Marine Plan areas
[426] The Waves As Resource (WAR) Report (2010). Surfers Against Sewerage.

Estuary, Hamble and Itchen Estuaries, Torbay and the Isle of Purbeck (see Figure 30).

Sea angling is also a popular activity within the six nautical mile limit and there are a number of large charter boats taking tourists out from ports such as Weymouth and Poole. They regularly frequent Poole Bay, the Isle of Wight, offshore from Brighton and the Isle of Purbeck (the latter also popular for coasteering). Outdoor swimming is popular between May and September and the Environment Agency monitor and report on the cleanliness of our bathing waters during this period. On the south coast, there are many beaches which meet the minimum or higher standards for bathing water quality and are suitable for outdoor swimming. [427].

[427] http://environment.data.gov.uk/bwq/explorer/index.html

Marine Management Organisation

Figure 30: Recreational activities

September 2013

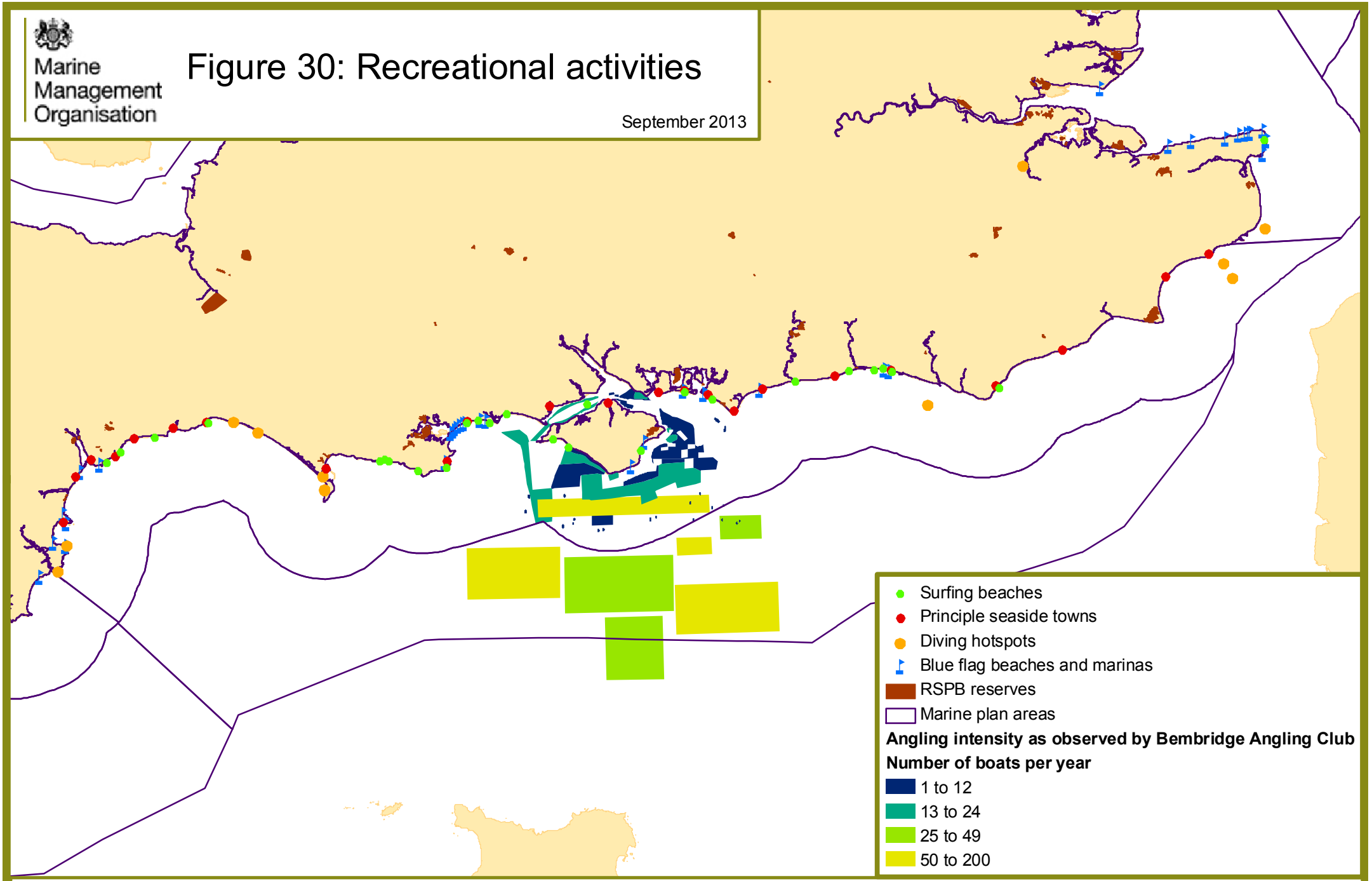


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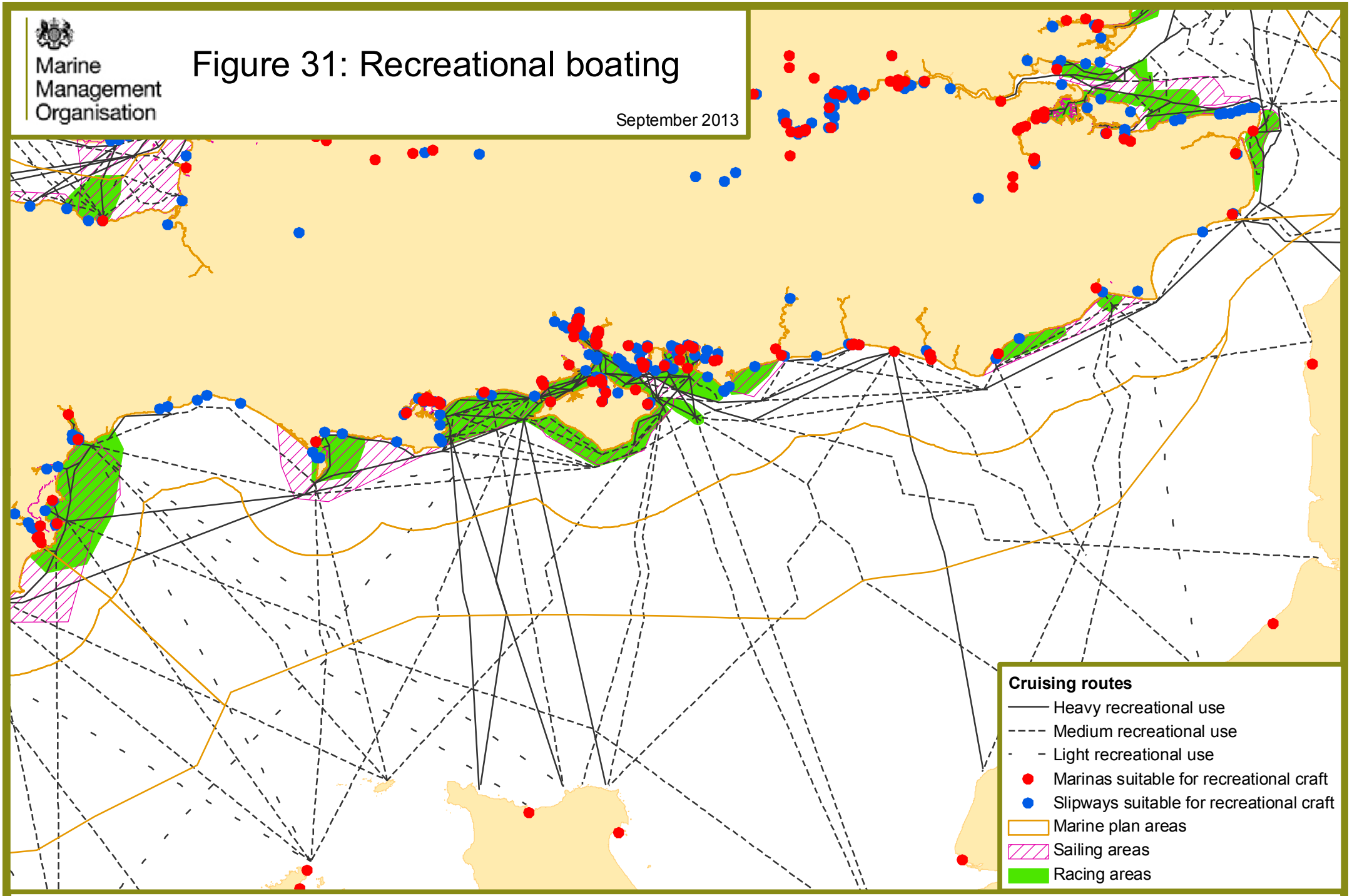
Figure 31: Recreational boating

September 2013



Future trends

The popularity of water sports and related industries has grown dramatically and has become an increasingly important aspect of the marine recreation and tourism market in recent years[428]. For example, the surfing industry grew by an estimated 10% globally from 2004-08, but the recent economic recession has subsequently reduced growth[429].

Between 2000 and 2010, the recreation sector experienced a high growth in numbers in many different activities including surfing, kite surfing and kayaking,[430] and since then participation has stayed relatively the same except for 16-34 year olds where participation has declined since 2002[431].

The water sports participation study highlighted that, during the 12 months to September 2012, 5.8% (2.8 million) of the UK population participated in at least one of the core boating activities[432]; this is a 3% decline compared to 2005 and follows the broad trend of decline since 2002[433]. Despite this decline, the British Marine Federation (BMF) reported the total revenue of the UK leisure, super yacht and small commercial marine industry in 2012 to be up 0.3% from 2010-11, totalling £2.855 billion[434].

Also, a coastal path around England is being developed by Natural England supporting the obligations introduced through the Marine and Coastal Access Act (MCAA 2009) which will encourage access to the coast and marine area.

A recent study[435] looking into future trends of different marine sectors, commissioned by the MMO, indicated a number of drivers which will influence the future direction of recreation:

- Marine conservation zones (31 put forward for tranche 1) may influence where recreational activities can take place, this could include some displacement of sailing and sea angling at some sites and increased scuba diving and sea angling at others but this is dependent on management measures
- Climate change will influence future temperatures, precipitation and storminess levels
- Future offshore renewable energy developments may influence where recreational activities can take place, particularly sailing and sea angling, although due to their characteristics (mostly use only the sea surface for a

[428] Lazarow, N. 2007. Journal of Coastal Research. The value of coastal recreational resources: a case study approach to examine the value of recreational surfing to specific locales.
[429] SIMA, 2011. 2010 SIMA Retail Distribution Study. A report by The Surf Industry Manufacturers Association.
[430] United Kingdom Marine Monitoring and Assessment Strategy (UKMMAS) (2010). Charting Progress 2 Feeder Report Productive Seas. Defra on behalf of UKMMAS. 472pp.
[431] Watersports and Leisure Participation Report (2011). BMF, MCA, RNLI, RYA and BCU.
[432] Small sail boat racing, Other small sail boat activities, Yacht racing, Yacht cruising, Power boating, General motor boating, Canal boating, Canoeing, Rowing, Windsurfing, Water skiing, Using personal watercraft.
[433] Watersports Participation Study (2012)
[434] UK Leisure, Superyacht and Small Commercial Marine Industry, Key Performance Indicators (2011/12)
[435] South Marine Plans Future Analysis (2013). MMO.

short period and do require permanent infrastructure most recreational activities are able to co-locate with other activities (such as offshore renewable wind farms, commercial shipping) this may reduce the potential for displacement
- Overall, this report indicates that the recreation sector will grow in the future in line with the recovery of the UK economy

Potential key issues

- It is important that associated facilities (marinas, clubs) and infrastructure (slipways, moorings), both on land and in the sea, are maintained and developed to facilitate growth within the marine recreational industry
- Navigational safety is mostly addressed through existing measures (such as codes of conduct), but development of other industries (renewable energy, aquaculture) will potentially squeeze recreational activities, particularly sailing and boating, into commercial shipping lanes which poses a safety risk for all parties involved if not managed effectively. Furthermore, with the potential for increased shipping traffic, this could compound the risk to recreational sailors. The RYA are keen to agree operational exclusion zones with industry and they have a number of position statements[436] on co-location with aquaculture and offshore wind farms
- Physical access to the water is limited in the South marine plan area because of the low number of public access slipways. There are many privately owned marinas on the South coast which enable boat access to the water, but publicly accessible slipways would enable more visitors to participate in boating as well as other recreational activities such as kayaking
- Conflict between different recreational activities occasionally occurs as evidenced by a policy in the Chichester Harbour AONB management plan to minimise any potential conflict. The likely long term growth of recreational activities may increase this risk of conflict i.e. between personal water craft users and sailors
- With the potential growth in recreational activities coupled with the development of other activities and industries, there could be a challenge in maintaining the existing recreational activities on the south coast of England
- The growth of other activities and industries poses a risk to recreation, and to its health and wellbeing benefits for local communities and tourists alike

Interactions with other sectors

- Participation in marine recreational activities is inherently linked to tourism. There has been a shift towards visitors who are focusing on experiences rather than material goods therefore in order to maintain the recreational industry, the tourism industry must also be supported
- There are a high number of terrestrial and marine designations in the South marine plan areas. The designations, due to their features, views and/or cultural heritage, attract many people to the area and encourage participation

[436] Example of RYA position statement: www.rya.org.uk/SiteCollectionDocuments/legal/Web%20Documents/Environment/RYA%20Position%20OREI%20Wind%20-%20May%202012.pdf

in outdoor recreation. Proposals that impact on these designations could in turn impact on the tourism and recreation economy

- Recreational activities, particularly sailing and boating, are being squeezed into commercial shipping lanes which pose a safety risk for all parties involved. Although co-location is already encouraged, e.g. the RYA and UK Renewables have an agreement regarding the minimum height of rotor blades, this is not always possible and agreements do not exist for all other activities. The RYA recognises that sailors must occasionally cross commercial shipping lanes but this is down to necessity rather than choice

Issues for sustainability

- Consideration of the impact of multiple marine recreational activities on both marine designations and the wider marine environment should be considered, especially with the predicted overall, long-term growth of the sector marine recreation relies heavily on a healthy marine environment, especially water quality, as healthy beaches and clean waters attract people to the coast and enable participation in water-based recreation in a safe manner. In turn, long term growth of recreational activities may cause a negative impact on the marine environment therefore a balance should be considered
- The growth of other sectors which could impact or encroach on recreational activities is likely to have adverse socio-economic effects on local communities dependent on the recreation sector
- There are a number of different predictions for the impact of climate change on marine recreation. Warmer weather and sea temperatures could support the growth of the sector, attracting more people to participate in marine recreation. Increased storminess and unpredictable weather could lead to lead to a decrease in participation levels. Furthermore warmer sea temperatures could lead to increased cases of vibrio disease.

2.15 Social considerations

The South has significant conurbations that are increasingly interspersed with sparsely populated rural areas towards the West. Communities generally have a high level of affluence and low levels of deprivation. However, there are significant pockets of high deprivation. There are areas with very high numbers of people above retirement age and conversely areas with unusually low numbers. Health and well-being tends to be good apart from the deprived areas. Proximity of many people to the coast and its protected landscapes can mean a greater understanding and interest generally in the marine area.

Current situation

In order to better understand the types of communities bordering marine plan areas, and how they could benefit from the introduction of marine plans, the MMO commissioned a socio-economic study[437]. This report still provides the most directly relevant analysis of the socio-economic processes at work in English coastal communities and the benefits to, and opportunities for, marine planning. However, as

[437] MMO (2011), Maximising the socio-economic benefits of marine planning for English coastal communities

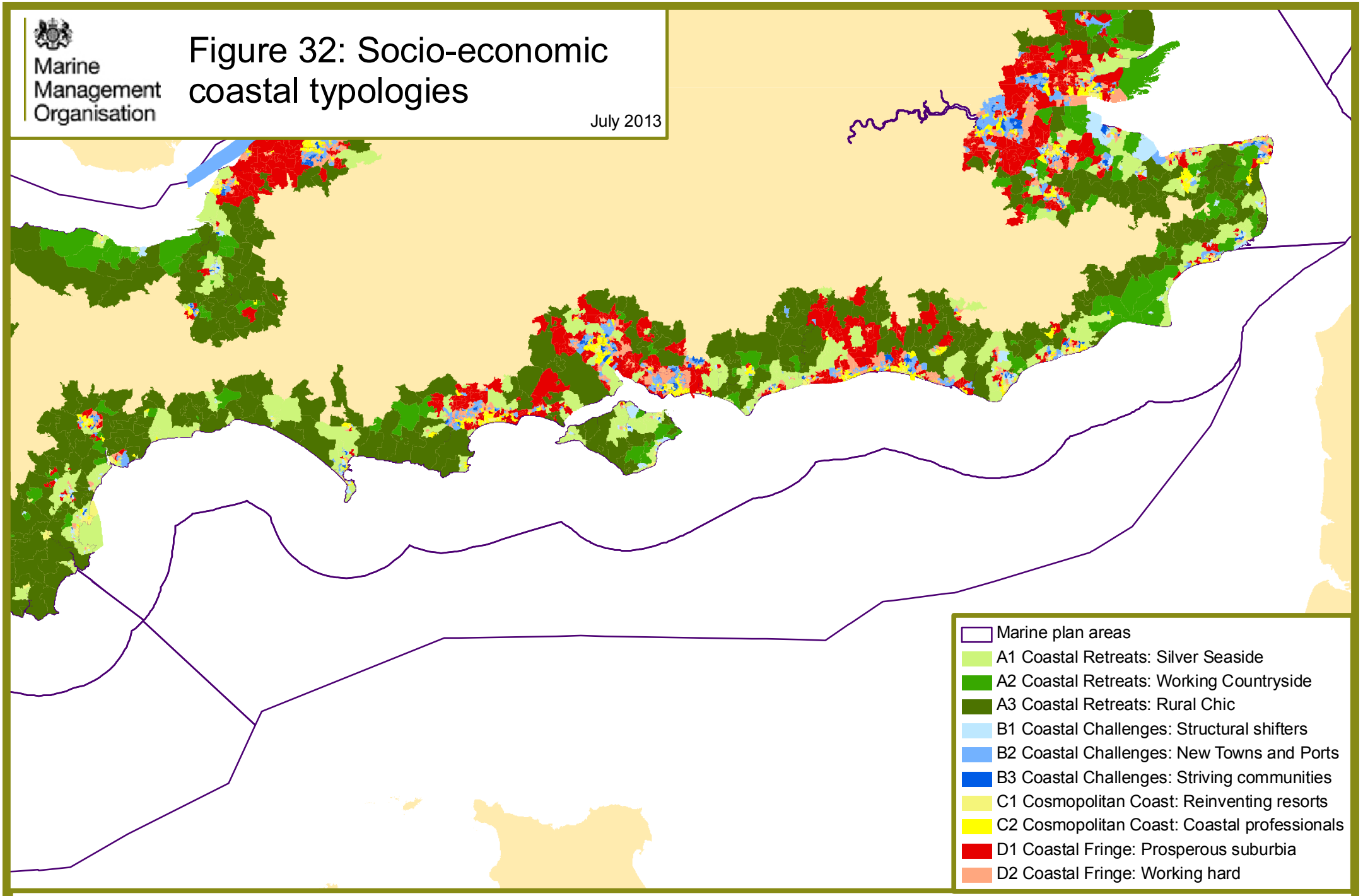
the reports relied to a degree on a synthesis of 2001 census data, there are limitations in the confidence that can be placed on their findings.

The study developed a set of coastal typologies which provide a swift overview of the types of coastal communities and their characteristics including current position and recent trends (see figure 32). This is best viewed next to figure 33 that shows the distribution of local authorities.

Marine Management Organisation

Figure 32: Socio-economic coastal typologies

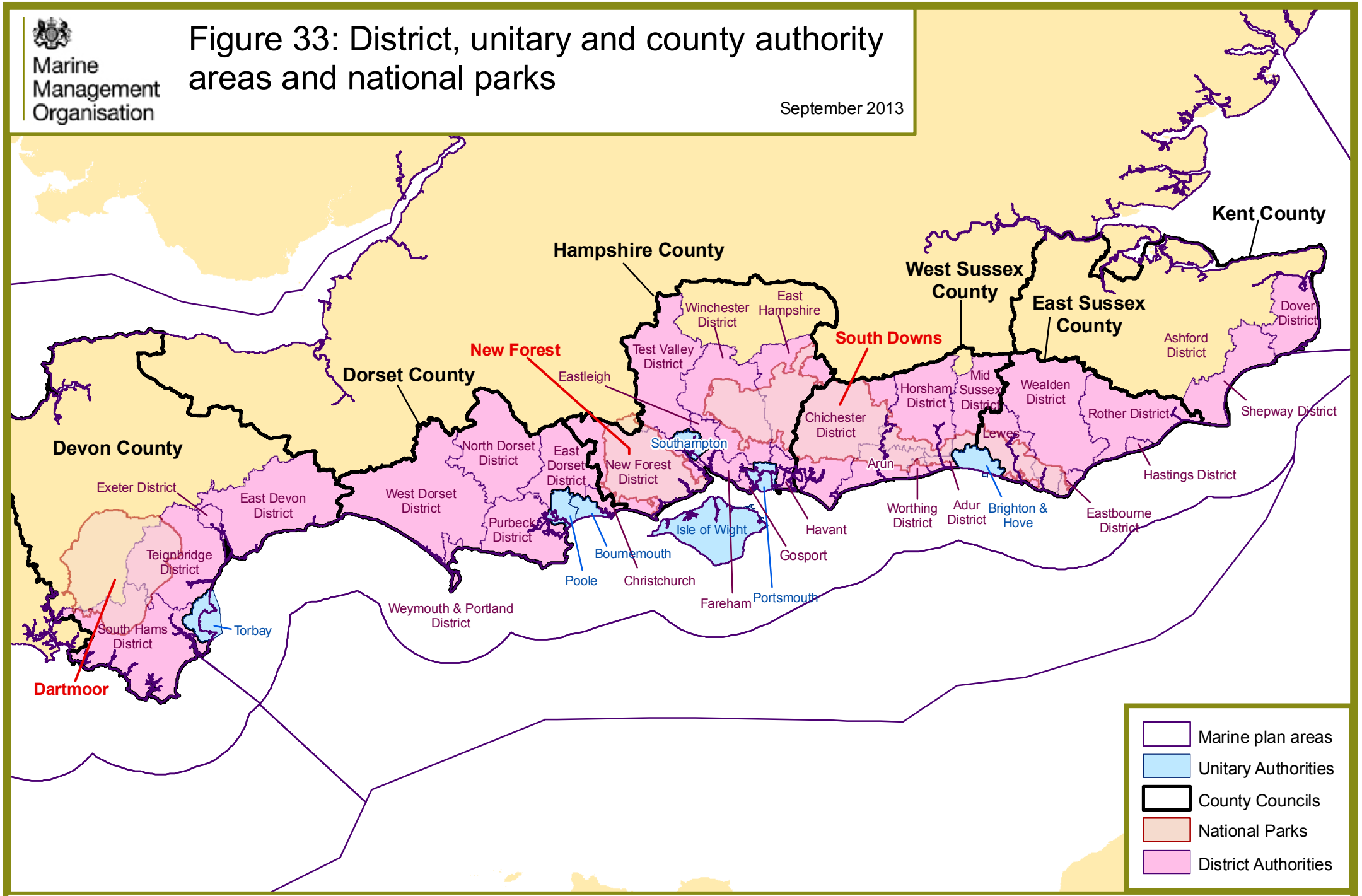
July 2013



Marine Management Organisation

Figure 33: District, unitary and county authority areas and national parks

September 2013



The South marine plan areas' communities have the highest percentage of "coastal professionals" (C2: Cosmopolitan Coast[438]) of any plan area (not including London). These are city and market town service centres with highly skilled populations and dynamic economies. It includes areas in and around the seaside cities of Brighton, Portsmouth (Southsea), Southampton and Worthing. It also includes historic county towns such as Lewes, Chichester and Exeter. Many people are highly qualified and working in high-skilled sectors including knowledge economy activities, real estate, renting and business activities and education. Brighton has also retained one of the highest levels of holiday spend in England.

There has been a high level of jobs growth in recent years and employment is less likely to be part-time. These areas tend to be relatively close to employment centres, however, a high proportion of people commute long-distances to work. Many people live in private rented accommodation and there is also a high proportion of student households. Population densities and overcrowding are high. Conversely, it is common for people to live alone and the quality of the housing overall is the second highest of any coastal typology.

Deprivation levels are generally lower than the coastal average, but higher than the average across the coastal fringe and coastal retreat groups elsewhere in the South.

The South also has the highest level of "silver seaside" (A1: Coastal retreats) communities. These are retirement areas primarily located in smaller, less developed resorts including areas of Torbay, Selsey, Sidmouth, Seaton, New Romney, Emsworth, Southborne and on the Isle of Wight. These areas are sparsely populated, with low population density and with a high proportion of people of pensionable age. The vast majority of housing is owner occupied. These areas also have above average percentage of second homes/holiday accommodation.

The proportion of people receiving benefits is relatively low. These areas tend to be peripheral, with higher travel times to employment centres. Related to this, home working and self employment is more common in these areas. The Isle of Wight has the third highest level of holiday spend in England. Torbay also has a high level of holiday spend. These areas have a low level of crime.

The South has the largest number of affluent areas of "prosperous suburbia" (D1: Coastal Fringe). These are found predominantly on the edge of towns and in satellite suburban towns around larger coastal cities, for example, Wimborne Minster/Oakley and Ferndown/Three Legged Cross (Greater Bournemouth), Locks Heath/Bursledon/Whiteley and Botley/Hedge End (Southampton), Poole, Portsmouth and Worthing.

They have the highest average quality of housing of any coastal typology. People are more likely to own their own homes with a high number of them detached and large. There is a corresponding low percentage of second homes/holiday accommodation, well below coastal average.

These areas are characterised by low levels of deprivation on most measures.

[438] Coastal typologies: detailed methods and outputs (MMO, 2011)

People enjoy much better health than the England and coastal average. Employment in these areas is largely concentrated in service sectors, with a high proportion of people employed in finance and real estate and business activities. Self-employment and long-distance commuting are both common. These have the second lowest level of crime (on average) of all the typology groups.

The South has the second largest number of communities classed as “working hard”(D2: Coastal Fringe) including towns such as Peacehaven and Fareham/Portchester. These areas are characterised by a strong economy with a higher overall employment rate than all of the other groups. In general, employment is more concentrated in industrial sectors such as manufacturing and port activities than the average across coastal areas. Populations are more stable than any of the other typology groups with fewer people moving in or out of the area in a given year. There is a low level of crime compared to many other typology groups. Owner-occupation levels are high. The quality of housing is the second highest of any coastal typology with the Second lowest percentage of second homes/holiday accommodation, well below England and coastal average.

While not particularly common in the South, the area has the highest number of “rural chic” communities (A3: Coastal retreats) throughout England. These are predominantly rural areas, sparsely populated or in smaller settlements with populations less than 1,500 mainly in the hinterland in the East, and directly on the coast in the West. Rural chic areas are generally more prosperous with higher levels of skills and occupations and below average levels of deprivation. The people enjoy good health. They have the lowest levels of crime of all the typology groups.

They are very sparsely populated, with an average population density of less than 3 people per square km. Travel times to key services are significantly further than across other groups and car ownership is relatively high. As a consequence they have higher levels of home working and self-employment than other areas. The housing stock is characterised by a high proportion of relatively large, detached housing. These areas have the highest percentage of second homes/holiday accommodation, well above England and coastal average. There are also a higher proportion of households living in caravans than across other typology groups (although caravans make up a small proportion of the total housing). The overall quality of the housing is below average for England and the coast.

The South marine plan areas have the highest number of “new towns and ports” (B2: Social challenges) including Havant, Gosport and Exmouth. .Challenges relate to poor skills and high levels of worklessness, but counterbalanced by relatively strong economy and often located close to areas of economic growth. Employment rates are high compared to areas with similar levels of worklessness. A high proportion of people are involved in manufacturing, construction and activities associated with ports including marine transport, storage and communication. The proportion of people with degree level qualifications is below the coastal and national average, however there is a strong presence of knowledge industry jobs in these areas. This apparent contradiction suggests that skilled people commute into these areas to work from outside, with the areas attractive for businesses (for example with relatively cheap accessible land for development), but less attractive for residents.

They have the lowest percentage of second homes/holiday accommodation, well below England and coastal average.

As with “rural chic”, while not particularly common in the south, the area has the highest number of “reinventing resorts” (C1: Cosmopolitan Coast) communities. These are primarily tourist economies with high levels of deprivation, but diversifying to attract a more highly skilled population. They include some areas of Torbay, and also Totnes and Ryde. Hastings is the second most deprived seaside town in England and its residents contend with the effects of multiple deprivation – low incomes, few employment opportunities, poor health and low levels of educational attainment. A high proportion of people in this group are involved in tourist activities including hotels and catering. By contrast there are fewer people employed in industrial occupations. The population is, therefore, very transitory, with particularly high levels of seasonal unemployment.

These communities have the poorest quality housing on average of any coastal typology.

Despite relatively high levels of deprivation, skill levels are above average for coastal areas. There is also evidence of entrepreneurship with relatively high levels of home working and self employment, suggesting that despite the relatively weak economy, professionals may be ‘downshifting’ to these areas for lifestyle and environmental considerations rather than economic reasons.

People in these areas have poorer health than the England and coastal average. It has twice the average for people receiving benefits for mental health issues. It has the highest level of crime, well above England and coastal average.

A recent initiative to address the issues in Hastings has been the development of a Fisheries Local Action Group using the European Fisheries Fund. It will promote a future for the fishing fleet and improve local markets for fish products. Socio-economic benefits are also anticipated through promotion of tourism and recreation.

Future trends

Coastal communities are diverse and face a wide range of challenges. They have mixed degrees of economic success compared to inland areas[439]. Bournemouth, Brighton, Hastings, Southampton and Northing saw large relative improvements in their economies since 2009. Unfortunately, many have seen major downturns including Hastings which has shown the most dramatic fall of any place on long term economic performance (from 1901-2011), although the city has reversed that trend since 2009.

In order to address such changing socio-economic circumstances communities need to take action to adjust and find new directions for their place and its resources. Two new academies, an expanding university centre, and a recent £100 million new college for vocational training, are ways Hastings is addressing the major issues of the relatively low level of skills in the working-age population. Brighton has

[439] Cities Outlook 2013 (Centre for Cities, 2013)

successfully made the linkage between strong local environments, the attraction of a young, innovative population, and economic growth.[440]

There are four local enterprise partnerships (Laps) operating to promote economic growth in the South: Heart of the South West, Coast to Capital, South East and Solent. The Solent LEP is the only one outside the East and North East marine plan areas, which has a marine industry focus. Many of these marine industries are targeting the emerging industry of offshore renewable energy technology, whether it is for manufacturing, maintenance or to improve skills and knowledge.

The European Fisheries Fund has operated previously in the South. It offers communities the opportunity to address the challenges posed in their local area and funded a number of projects in the South in 2012-13 including; development of social enterprise, home industry start-ups and green infrastructure in Torbay; Europe's first National Coastal Tourism Academy in Bournemouth; a restaurant and training centre in Hastings Pier Gateway; and reinstatement of the Swanage to Wareham railway.

Declining fish stocks, rising costs of entry into the industry, environmental activism, climate change and the potential of offshore windfarm development have, or could, all put pressure on the fishing community in their ability to operate profitably. While many communities have significant fishing industries (Brixham, Shoreham, Southampton, Poole, Weymouth, Portsmouth and Selsey) there is general decline in the sector. Decline in employment in the fish catching sector and improvement in education promotes employment in other sectors or emigration of younger generation from local fishing communities. Crew members are now more likely to come from settlements distributed over a wider geographical area making social networks weaker and more dispersed[441].It is not clear how reduced fishing now may lead to long term benefit by contributing towards sustainable fisheries.

Climate change may lead to an increase in the numbers of visitors to coastal destinations, longer tourism seasons, increase in infrastructure and range of facilities and demand on natural environment[442].As noted below this may lead to negative social effects. Sea temperature rise, due to climate change, is likely to increase the abundance of warm water species[443]. This may prove a stimulant to the angling community, however, this is likely to be accompanied by the movement out of the area of traditional cold water species that may ultimately result in no overall increase in species diversity. Improved coastal access, and improvements in the economy, may attract more people to the coast for recreational activities. Changing lifestyles may cause a shift to experience (rather than material) recreation/tourism markets[444].

[440] Brighton: Regeneration of a major resort, in Coastal Regeneration in English Resorts 2010 (Walton and Browne, Coastal Communities Alliance, 2010)
[441] Whatever Became of Social Objectives in Fisheries Policy?, *Fisheries Research* 95, no.1: 1-5 (Symes, D, and J Phillipson (2009)).
[442] Impacts of Climate Change on Tourism, Marine Climate Change Impacts Annual Report Card 2006, Marine Climate Change Impacts Partnership (Viner, D., 2006)
[443] Marine Climate Change Impacts – Fish, Fisheries and Aquaculture (2012), (Marine Climate Change Impacts Partnership, 2012)
[444] Charting Progress 2 (Defra, 2010)

There is some evidence of improvement in health and wellbeing through living on the coast[445]. This may be through increased opportunity for physical activity and a general engagement with the coast, however, there is no proven cause-effect relationship and it may also be due to the "healthy migrant effect" through healthy (and wealthy) individuals moving to the coast and, therefore, contributing to a higher good health to proximity ratio. There may also be a possible negative effect due to overcrowding through increased tourism and recreation.

Potential key issues

While generally affluent, prime examples of the most deprived of the coastal typologies exist in the South marine plan area. The socio-economic study[446] identified that deprived coastal communities were most likely to benefit from marine planning where connections were made with the growth of offshore industries as it could create jobs and prosperity in those areas. Fishing has the greatest economic multipler, however, this is aligned to a growth in smaller "artisanal" operations rather than industrial-scale vessels.

A study commissioned by the MMO[447] outlined the social impacts of a number of activities. Management of people is a key issue in order to address conflict between different recreational use of areas and between locals and visitors.

The socio-economic study identified which types of industry and activity would particularly suit certain typologies:

All typologies are a probable good fit for marine dredging and disposal (other than estuary areas which are locally valued) and telecoms cabling.

C1, C2, A1, A3: fishing is a good fit where in keeping with historic character such as in Selsey (and when facilities are small-scale and carefully sited in C1 and C2). For C1 and C2, tourism and recreation are already doing well due to modernising and re-branding their tourism offer as is the situation in Brighton. Further tourism development, particularly of types which encourages a niche approach to particular market segments is likely to be popular. Tourism will be valuable in these areas due to the associated leisure and lifestyle benefits that it creates. Other activities are a partial fit (a mussel farm is proposed off Sidmouth), except for marine aggregates which is a poor fit.

D1, D2: fishing is again a good fit where in keeping with historic character such as in Poole and Portsmouth. Even processing facilities, as long as they are small-scale and carefully sited, will be sought for the jobs they bring. Together with B2 these are the only typologies with a probable good fit for aquaculture due to a positive view of employment opportunities. Exmouth, for example, has developed mussel farming.

[445] Does living by the coast improve health and wellbeing?, Health & Place 18(5): 1198-1201 (Wheeler, B. W., M. White, et al. (2012).
[446] Maximising the socio-economic benefits of marine planning for English coastal communities (MMO, 2011)
[447] Social impacts of fisheries, aquaculture, recreation, tourism and marine protected areas (MPAs) in marine plan areas in England, MMO Project: 1035 (MMO, 2013).

B2: Probable good fit with all activities except surface and waste water treatment. This is the only typology where marine aggregates are a potential good fit with population profiles, geographical character, and existing suitable sites and infrastructure such as Havant. Similarly, this is the only typology with a probable good fit for energy development. These areas have the labour markets and infrastructure to make energy development attractive to investors. The degree of local economic impact will depend on the extent to which the location is able to capture wider elements of the supply chain processes within the local economy.

The extent to which tourism and recreation will be a good fit for D1, D2 and B2 will depend to a great degree on local conditions. City break markets have performed relatively well over the past decade, and a number of industrial cities have seen strong hotel growth and a (at least partially) successful development of their tourism offer (such as Southampton). The jobs brought by almost any development would prove particularly popular in these areas.

In weaker economies, such as Hastings, housing shortages and high house prices are a social issue and a barrier to economic growth. This compounds the more immediately pressing issues of skills deficit, quality of local jobs and poor connectivity to other places.

Overdevelopment of coastal areas for housing and recreation and tourism infrastructure, together with the accompanying increased numbers of recreational users and tourists, may generate negative social impacts on locals as well as visitors. This is especially the case if the economic benefits to individual households are not clear[448].

Interactions with other sectors

The South marine plan areas have a particular “maritime” feel due to their history of fishing, the naval activity and coastal tourism. Tourism and recreation are important with the inshore having the greatest number of blue flag beaches of all English marine plan areas. Some areas have a very high holiday spend. The South marine plan areas have the highest percentage (16%) of boating activity in England due in part to the high number of Royal Yachting Association (RYA) member marinas (67). The Solent is considered to have the largest number of yacht moorings in the world. Dorset was particularly important for tourism in 2012 as it was home to the Olympic sailing competitions in Weymouth; the legacy of this activity continues to attract visitors. Angling charters operate out of Poole and Weymouth.

There is significant fishing activity in the South marine plan areas, particularly for over-15m vessels. Brixham was the English port with the highest value of landings in 2011, worth £26 million[449] due largely to the greater proportion of demersal species and shellfish landed there, which typically sell at higher prices per tonne than pelagic species. Fishing and smaller ports like Selsey and Shoreham are attractive for

[448] Does living by the coast improve health and wellbeing?, Health & Place 18(5): 1198-1201 (Wheeler, B. W., M. White, et al. (2012).)
[449] MMO UK Sea Fisheries Statistics 2011

tourism and provide a distinct social identity. However, this can also lead to an increase in property prices creating difficulties for locals[450].

There is high density shipping activity, particularly in the South Offshore marine plan area. Portsmouth and Southampton are significant ports but Portland is under-used. Portsmouth is one of the three main UK naval bases and is home to almost two-thirds of the Royal Navy's surface ships. It will be home to two new aircraft carriers, HMS Queen Elizabeth and HMS Prince Of Wales. It is a major element in the local character and economy, but is vulnerable to government spending cuts.

The area is also important for renewable energy. Two Round 3 offshore wind farms (Navitus Bay and Rampion) currently divide local opinion due to conflict between employment creation and adverse effects on visual impact. Local people may be more supportive of development of the powerful tidal streams around the Isle of Wight and off Portland. The Solent Ocean Energy Centre, on the Isle of Wight, is currently going through an application phase of a Marine Licensing application and could provide offshore testing facilities for tidal stream devices.

Aquaculture is a growing marine activity in the Exe, Torbay and off Sidmouth. It can increase employment and social development within peripheral towns or port areas where there are high levels of unemployment. Aquaculture is also being promoted as an activity which can contribute to the conservation of particular habitats and therefore maintain to some extent biodiversity and is seen as a “legitimate and responsible partner with other natural resource users[451]. Increased regulation and inspection could add to the costs of operation. However, this could positively contribute to continued professional development of staff in relevant environmental management and legislative knowledge (Lantra 2006). Restrictions due to site availability, environmental carrying capacity and availability of investment and labour (due to emigration) could hamper growth.

Much of the area is protected for its natural and cultural heritage value. There are nine UNESCO world heritage sites in the South marine plan areas including the only natural coastal site, the Jurassic Coast in Dorset. Roughly half of the coast has protected landscapes such as national park and AONB. They have the only candidate special areas of conservation (cSACs) in England and significant numbers of existing designations, including the highest number of special areas of conservation (SACs) (although not the largest area protected) of all marine plan areas. Many MCZs are also proposed. The Isle of Wight has almost its entire coastline under designation. With so much of these protected areas inshore and coastal, the nearby large populations have a closer engagement and stake in them than elsewhere in England. There is a convergence with management of biodiversity as coastal squeeze, which adversely affects habitats and species of the foreshore, is also threatening amenity beaches. There remains a belief in the minds of some of the public that offshore aggregate removal is exacerbating coastal erosion despite evidence to the contrary.

[450] Constructing ‘The Stade’: Fishers' and non-fishers' identity and place attachment in Hastings, south-east England. Marine Policy 37(0). (Urquhart, J. and T. Acott, 2013).
[451] Social and economic policy issues relevant to marine aquaculture, J. Appl. Ichthyol. 17, 194-206 (Burbridge, P, Hendrick, V, Roth, E. and H. Rosenthal (2001)

Issues for sustainability

- People gain many social benefits from ecosystem services (such as clean air and water and use of the environment for tourism and recreation), but can also produce significant positive and negative impacts. Achievement and maintenance of good environmental status, through integrated management, is a major challenge for marine planning.
- Consideration of the cumulative impact on social character of communities in transition from historic dependence on fishing and/or tourism.
- While important to manage the fisheries for their overall sustainability, their socio-economic importance for local fishing communities must be recognised.
- Solent has major issues for water quality and its sediment budget.

2.16 Economic considerations

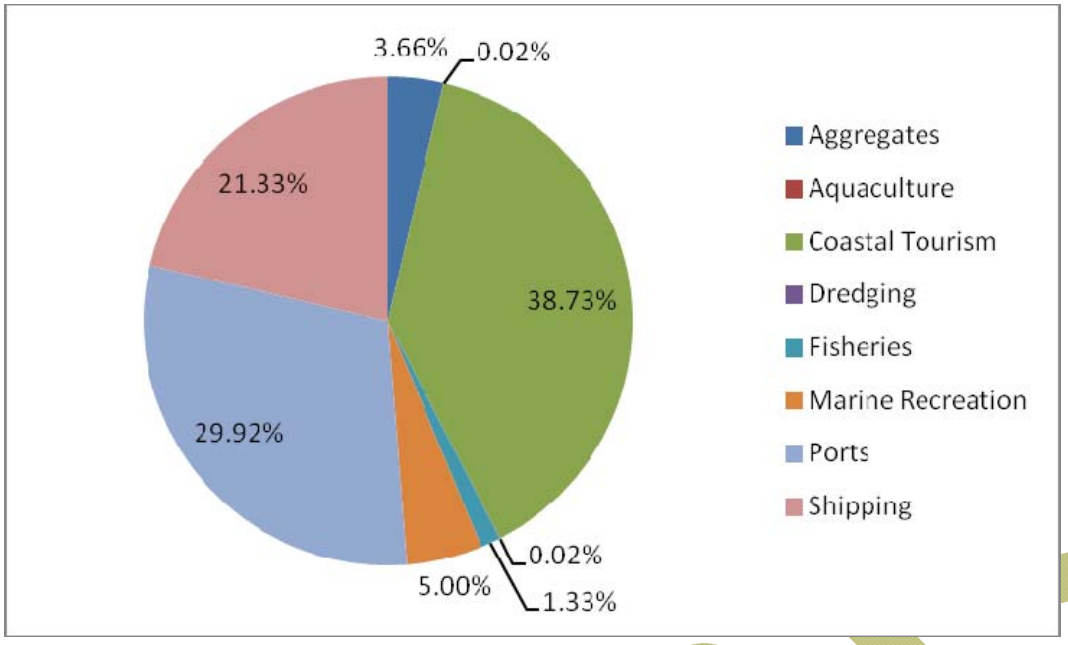
The economic activity undertaken in, and reliant upon, the South marine plan areas is varied, covering a number of sectors and supporting activities. These activities provide productivity and employment benefits to those communities on the coast and further inland, as well as providing resources such as aggregates, for use in further economic activities on land. Each sector in this report has its own section looking at the detailed economic considerations, so this section will look at the overall economic picture, including the relative contributions of each sector, the economic development priorities of local authorities and local enterprise partnerships (LEPs) and future developments that may influence the economic activity of the South marine plan areas. This section will use gross value added (GVA)[452] and employment benefits of activities as indicators of economic activity. The MMO commissioned a report[453] to provide an economic baseline for the economy of the South marine plan areas, looking at the current situation and potential future growth of the range of sectors and this section will use this report to describe the current and future situation.

Current situation

The total gross value added (GVA) for the marine economy in the plan areas across all sectors in 2013/14 is forecast to be £3,895 million. It is important to highlight that this was based upon what data was available; information is not accessible for every sector. The key sectors contributing to the total GVA of all sectors include coastal tourism, with 39% of the total GVA (£1,508 million), ports, with 30% of the total GVA (£1,157 million), and shipping, with 21% of the total GVA (£825 million). This is demonstrated in figure 34.

[452] GVA is a measure of the economic contribution of an individual producer or sector of the economy.
[453] MMO (2013). Economic Baseline for the South Inshore and Offshore Marine Plan areas

Figure 34 Proportion of GVA for each sector within the plan areas in 2013/14[454]



A report produced for the partnership for urban South Hampshire (PUSH) identified that the naval base in Portsmouth injects £334million into the local economy. While this figure is not directly comparable to GVA for other sectors, it does give some indication of the size of the defence sector and its importance. For sectors such as dredging and telecommunications, while they are activities that generate economic benefit in their own right, their main benefit is to enable other sectors that generate more significant economic benefit, such as shipping, in the case of dredging.

Employment

The South marine plan areas are forecast to employ, directly and indirectly (through related activities) over 330,000 people in total in 2013/14. Coastal tourism is the predominant employer for both direct and indirect employment, though the data (see figure 35 below) does not reveal the quality or level of remuneration of the employment; tourism employment can be seasonal, and have lower wage levels than other sectors.

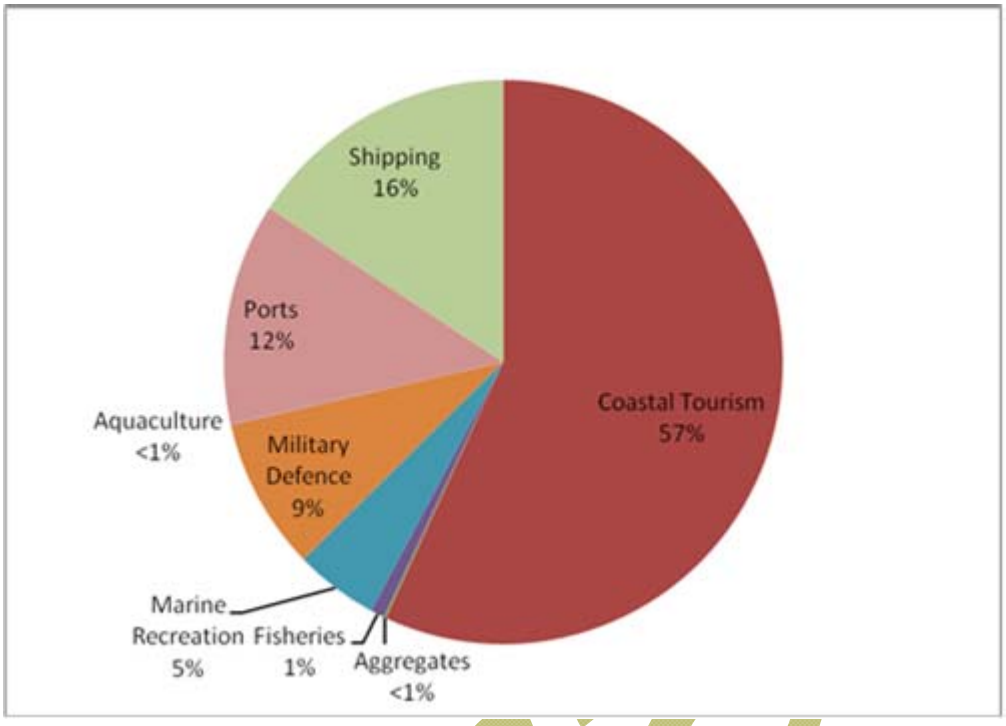
The socio-economic report produced for the MMO[455] highlights the roles that different activities can have in providing local employment benefits for different skills levels. For example, it highlights the positive role that ports can have in providing large amounts of relatively low-skilled labour, having a positive impact on deprivation, as deprived areas are those with concentrations of low-skilled people. The other main employer, coastal tourism, is also a large employer of lower skilled people, though this work can be more seasonal. Taken together, these suggest that

[454] Note: this does not include GVA data for Coastal Protection, Military Defence, and Telecoms and Communications due to lack of quantitative information despite there being significant economic activity within the sectors. For Renewables, CCS and Oil and Gas comparatively little economic activity is believed to be currently taking place and therefore these sectors are also not quantified.

[455] MMO (2011) Maximising the socio-economic benefits of marine planning for coastal communities

marine activities of the sort that dominate the economic picture can have a positive effect on deprivation.

Figure 35 Employment distribution by sector in South marine plan areas



Geographical distribution

There is a geographical split in activity, with much of the intensive marine industrial activity centred on the Solent, as well as the largest concentration of shipping and ports activity. Further West, the unique natural environment is very important for the tourism industry, though fishing, ports and shipping activity are also important. These activities are centred on towns and villages along the coast, such as Brixham and Poole and shipping is primarily passenger transit and short-freight routes across to the continent. East of the Solent are a number of urban centres, such as Brighton, which have significant tourist industries centred on a 'seaside' offer, that have diversified to include business tourism in their offer.

Much of the remaining economic activity is located according to resource availability, for example aggregate dredging and fishing, which take place where the resource can be found. Fishing and aggregates are also examples of economic activity which might not have a large direct economic contribution, but which do provide materials that are crucial to larger industries on land, for fishing this is food processing and for aggregates this is construction.

Current policy

This has a strong focus on economic growth, as the means, along with deficit reduction, to move the economy further out of recession and tackle public debt. The range of policy to enable this includes:

- the Strategy for Growth, which looks to rebalance employment from the public to the private sector, as well increasing productivity
- the Spending Review 2013 and associated infrastructure plan, 'Investing in Britain's Future', which set out spending priorities, including a single growth fund for investment in projects to grow the economy
- delegation of European funding for economic development to local enterprise partnerships, subject to suitable strategic economic plans
- sector strategies for renewables, oil and gas and nuclear, which look to further maximise the use of resources provided by marine and coastal areas

At sub-national and local levels, policy is very supportive of economic development, with the 'presumption in favour of sustainable development in the national planning policy framework being clearly reflected in most of the local plans along the South coast. Many local plans highlight the importance of the marine environment and accord importance upon its conservation or preservation, particularly linked to coastal tourism, which often relies on the environment. Port development is often prioritised too, reflecting the economic importance of these two sectors to the economy of the South marine plan areas.

Future trends

Five local enterprise partnerships (LEP) cover the area next to the South marine plan areas. LEPs are business-led partnerships that will drive future economic development at the sub-national and local level. Their activities are driven by local economic circumstances and priorities.

LEPs are being given increasing control over funding and investment and are currently developing strategic economic plans, to inform investment for the future, primarily over a 3-6 year timeframe. Coastal tourism is a priority for three of the LEPs, with tourism in general being a priority for the remaining two. Ports, marine engineering (for the marine energy and shipping sectors) and defence (primarily naval across the LEP areas) are also mentioned by multiple LEPs. As priorities for economic development, it can be assumed that these sectors will be subject to future efforts to stimulate and increase growth over and above that anticipated or planned for currently. The focus on these sectors suggests that there may be increased positive impacts on deprivation, due to the large numbers of lower-skilled people employed in these sectors. It also suggests that there will be increased levels of shipping and larger areas of coast given over to ports and marine fabrication activities.

There are threats to economically important sectors though; the Solent LEP has highlighted that, due to the Strategic Defence Review, there is scope for a change in the nature of the work undertaken at the Portsmouth naval base, which would have an impact on the economic contribution to the local economy. Under a range of scenarios, this could ether be a positive impact, as more work moves to the base, or a change in the work at the base which may have a more complex effect on the economic benefit derived from the base. The future trends report commissioned for

the MMO[456] suggests that the most likely scenario is an expansion of the Portsmouth base, with possible increased economic benefit.

Coastal tourism is reliant upon the natural and built environments along the coast. Changes to these environments, for example from other, intrusive economic activities or developments that are not in keeping with the existing character of an area, can have an unintended negative effect on this important sector.

Potential key issues

The key issues for economic activities primarily relate to:

- the amount of growth possible, given environmental considerations
- impacts upon other sectors, for example upon coastal tourism through inappropriate developments
- maintaining the competitiveness of key sectors, such as ports and shipping
- the ability to maximise benefits for deprived areas from expansion in marine sectors.

[456] MMO (2013) South Marine Plan Futures Analysis

3.0 Key issues and themes

This document presents a summarised view of the evidence pertaining to the South Inshore and Offshore marine plan areas. It has also presented an initial view of the key issues that affect the environment, economy and society within and adjacent to the South marine plan areas. In so doing over 70 issues have been identified, some of which relate to issues that are wider than marine planning, or where marine planning is only a part of the solution to the issue.

Many of these issues have common aspects, for example sectors that are affected by, or that are driving the issue. This chapter presents the results of analysis undertaken by the MMO to categorise the issues into five key themes, in order to better understand them. The key themes are:

- Enabling economic growth
- Protection of the environment
- Opportunities for employment, investment and regeneration
- Maintaining and enhancing social benefits
- Climate change

In categorising the issues into themes, we have attempted to be objective, but there are many different ways of categorising the issues, given their complexity and diversity. Once we had developed key themes, we undertook analysis to select those where we feel marine planning is at least part of the solution, based upon experience gained from developing the East marine plans Further analysis led to a number of overall issues that sit under a theme. Examples of the original issues are included under each overall issue to illustrate the type represented by an overall issue.. In doing this work, we have also been able to identify impacts, the industries and considerations that drive the overall issues, as well as those that are affected by it. We have also suggested possible planning responses which may address the issue and could conceivably be used to develop plan policies at a later date. These are purely for illustration purposes at this stage and will be refined following the SPAR consultation and further stakeholder engagement.

In developing this table we have not been spatially specific, except in one or two examples. However, by looking at the sectors and topics driving the overall issue and then looking at where that sector or topic exists, we can map where the issue may occur. We can undertake the same process for the sectors or topics impacted by an issue (receptors) and map those too. This information could potentially identify hotspots, where multiple issues exist. The table is presented below.

Table 9: Key issues and themes

Key themes	Sectors and considerations driving theme	Issues	Possible Impacts	Receptor (sector/consideration)	Possible Responses N.B. these are for illustration only
Enabling economic growth	Offshore wind, tidal energy, ports, shipping, tourism, recreation, defence, aquaculture.	There is a need to understand the growth of new and existing sectors, in terms of the amount of growth and where this growth might occur. Sectors that are expected to grow need space to do so and have particular requirements and individual issues, e.g.: Tidal resource is relatively limited and would need protection from other activities to ensure it is not sterilised before the industry has the technology to harvest it – offshore wind zones and tidal resource areas overlap Expectation of significant growth in the size of the aquaculture sector, potentially offshore and including macro-algae as a form of energy production. Potential growth requires significant space There is the potential for the needs of the ports and shipping market to clash with restrictions on ports, e.g.: no increase in channel depth due to environmental considerations limited space for ports infrastructure to develop in existing ports, due to designations of land or other uses of the coast Cable routes are often partially dependent on the location of physical developments they are connected to, as well as where other activities use the seabed and coastline. Development of other industries will potentially squeeze tourism and recreation activities. These in turn are dependent on a healthy marine and coastal environment, which may also be affected by development, but also increased use from tourism and recreation activities. Increased demand for capital dredging and disposal sites due to a trend towards larger ships, particularly in bulk and	Potential for constraint of growth of some industries, as there may be competition for space. This could impact other growth industries and industries not forecast to grow significantly. Increased impact on the environment from overall growth of industries, particularly in areas already under significant pressure. Potential for high levels of economic	Tourism, recreation, fishing, seascape/visual resource, heritage/cultural assets, natural environment, shipping, ports, offshore wind, tidal energy	To enable growth, appropriate locations for different types of development could be identified and allocated to an activity, so it has precedence. Areas could be protected for particular industries' future development. Future design of physical structures could be changed to accommodate other industries.

		container shipping. The current dredging fleet are coming to the end of their lifecycle therefore the plans will influence the marine aggregate industry's next cycle of capital investment, estimated to be £1billion.	growth, with increased benefits for the communities close to the South plan areas.		
Protection of the environment	Tourism, recreation, fishing, seascape and visual resource, heritage and cultural assets, natural environment	The growth of industries could conflict with areas or species protected for their environmental importance, as well as areas that are not protected but that play an important role in providing environmental goods and services and for their intrinsic value, e.g.: Dibden Bay is recognised by both Southampton City Council and the New Forest District Council as the only place for significant expansion of the Port of Southampton. It is likely that ABP will commence a master planning exercise of the proposed development within the next six years or so. It should be noted that master planning will need to include consideration of the prevailing designations at or adjacent to the Dibden Bay site Natural sedimentary systems can be changed by dredging & disposal, which cause physical changes to contributing structures, e.g. alteration of channel depths Undesignated sea grass areas are susceptible to damage from abrasion pressures caused by e.g. trawling and anchoring activities Bird populations could be affected by increases in tourism, recreation, shipping and offshore wind The further development of the network of Marine Protected Areas, changes to management measures in current designated areas and implementation of the Marine Strategy Framework Directive could all increase the potential for conflict with industry	Potential for constraint in growth of industries due to environmental protection, but with benefit of maintaining important environmental assets **OR** Potential for environmental degradation, but with benefit of growth of industries	Ports and shipping, Dredging and disposal, defence, tidal energy, offshore wind	Possible opportunity to find alternative sites for development, or for new habitat development
		Some industries rely upon the environment for their product or	Environmental	Natural environment,	Demonstrate

		service (e.g. tourism). These same industries have impacts on the environment and growth in those sectors could increase those impacts, e.g.: Potential conflicts in promotion of tourism in seaside locations, including growing the jobs market and visitor numbers, and maintaining natural environmental assets at the same time. The health of the marine environment, especially the water quality, is very important to tourism and recreation	degradation, possible decline in industries linked to quality of the natural environment, with related economic and social impacts	tourism and recreation, fisheries, aquaculture	the value of the marine environment for goods and services, and safeguard areas with high benefit
		Some areas may be at or near their environmental carrying capacity, e.g.: Aspirations for increases in the industries with the most environmental impact will place significant further pressure on the environment, particularly around the Solent. The South coast and East English Channel marine aggregate regional environmental assessments (MAREA) have produced cumulative impact assessments for the marine aggregates extraction industry and the potential effects on other marine industries. The detailed assessment indicates that current extraction activity is within current acceptable environmental limits.	Further growth in industries may start to have significant impacts on the environment, limits may be exceeded. This in turn may limit the growth of industries reliant upon a high quality environment	Natural environment, tourism and recreation, fisheries, aquaculture	Identify environmental limits and areas at or near carrying capacity. Provide more detailed guidance for the management of activities in these areas
Opportunities for employment, investment and regeneration	Ports, shipping, tidal, offshore wind, tourism, fishing, aquaculture	Some seaside towns are in decline and need regeneration and investment. Growth in key marine sectors can help to drive this investment. At the same time, it can provide opportunities for access to work for deprived communities, due to the range of skills required for marine sectors and locations near to the deprived communities, e.g.: Newhaven has been identified as the preferred option for the operation and maintenance base for Rampion offshore wind farm. The Navitus Bay development has yet to identify its	Increased local economic growth due to growth in marine sectors. Growth of marine sectors send	Natural environment, heritage, cultural assets, seascape, visual resource	Enable development of key industries that provide local economic benefits and act as catalysts for regeneration

		preferred operation and maintenance port, but Poole, Portland and Yarmouth are currently being considered. Economic outcomes will vary depending on the choice of port for construction, operations and maintenance activities The cruise market in Southampton could offer benefits to the local area however, it has been suggested that most of those who arrive go straight to London rather than staying locally, despite the tourism assets along the South coast.	signals and influences further investment		and investment
Maintaining and enhancing social benefits	Tourism, recreation, fishing, seascape and visual resource, heritage, cultural assets, natural environment	The natural environment, heritage, views and cultural assets of the South coast are a significant part of the reason that people visit, live and work there. They provide environmental, social and economic benefits and the linkages between them and with other activities are complex e.g.: There are a high number of terrestrial and marine designations in the South marine plan areas. The designations, due to their features, views and/or cultural heritage, attract many people to the area and encourage participation in outdoor recreation There may be potential conflicts between tourism and recreation such as multiple beach users and demand for space at sea. Coupled with the potential growth in recreational activities and with the development of other activities and industries, there could be a challenge in maintaining existing tourism and recreational activities on the South coast of England There are many privately owned marinas on the South coast which enable access to the water, but more publicly accessible slipways would enable more visitors to participate in recreational activities by making activities more accessible to all Fishing is important to the sense of identity in some places (e.g. Hastings) and character of place (e.g. Rye) so any displacement could impact on this. It is a contributor to the cultural heritage of places and as such is a part of the tourism offer Tourism and recreation hotspots have may have an effect in	Potential damage to natural and heritage assets Increased economic benefits from growth in tourism and recreation, but risk that this may be lessened if damage to natural and heritage assets lessens the attraction to the area	Natural environment, heritage, cultural assets, seascape, visual resource	

		relation to the visual impact as well as the direct effects of increased footfall on the coastal environment and heritage assets			
Climate change	Activities that emit greenhouse gases	Climate change could have both costs and benefits for the communities and industries that live by and use the South marine plan areas, e.g.: Warmer climatic conditions, leading to increased levels of tourism and recreation Increased risk of loss of tourism infrastructure, e.g. beach loss Reduced access to aggregate resources and increased opportunities for wave energy due to increased storminess and average wave height Increased flooding and coastal erosion, which in turn could lead to increased sediment loading in estuaries and coastal areas.	Potential for increased levels of tourism and recreation, with economic benefits Increased flooding and coastal erosion could impact upon port and shipping activity as further dredging of sediment may be required (which has an economic impact) to enable them to continue their activities	Natural environment, tourism, recreation, aggregates, wave energy, dredging and disposal	Identify vulnerable locations and sectors to assist in adaptation and mitigation strategies.

4.0 Next steps

The purpose of the draft SPAR is to provide a platform for stakeholder engagement on the potential key issues relevant to the South marine plan areas and to validate the evidence on which our assessment of issues has been based.

The consultation on the draft SPAR, including the issues workshops in October 2013, will give stakeholders the opportunity to understand the evidence base and highlight gaps for further work, inform us as to whether they recognise the issues and agree with the themes, and offer early thoughts on possible solutions that marine planning may deliver.

Following the consultation on the draft SPAR, comments received by stakeholders will be considered, and utilised in a number of ways as follows:

- A revised final version of the SPAR will be published, incorporating appropriate changes to the issues, themes and any initial thoughts on possible planning responses.

- As described in section 1.3, the MMO has recently published, and is currently commissioning, a number of projects which will provide additional evidence to inform marine planning in the South. Where it is highlighted that further evidence is required in support of the issues, the MMO will aim to source that evidence, or may consider additional commissions.

- Feedback on the issues and possible planning responses will be used to develop an early working vision for the South marine plan areas, which will be subject to further stakeholder engagement.

- The revised SPAR and working vision will be key inputs to inform later stages of planning, such as the development of different policy options.