Dr JOHN WEBB

Comments as an Interested Party

ANNEX A - EXTRACTS OF SOURCES

Under the Town And Country (Inquiries Procedure) (England) Rules 2000

Planning Appeal Reference: APP/D1265/W/23/3327692

APPEAL BY: Powerfuel Portland Limited

PROJECT: Construction of an Energy Recovery Facility (ERF) with ancillary buildings and works

SITE: Land adjacent to Balaclava Bay at Portland Port, Castletown, Portland, Dorset, DT5 1PP

CONTENTS

Guidance

UK carbon capture, usage and storage

How the government supports the development of carbon capture, usage and storage (CCUS) in the UK and internationally.

From: Department for Energy Security and Net Zero and Department for Business, Energy & Industrial Strategy

Published 22 January 2013

Last updated 1 February 2019 — See all updates

Targeting the substance to measure

For regulatory monitoring the substances will be those specified in your permit. However, even when the substance has been specified, you may still need to consider what precise form of the substance you should measure.

Different phases

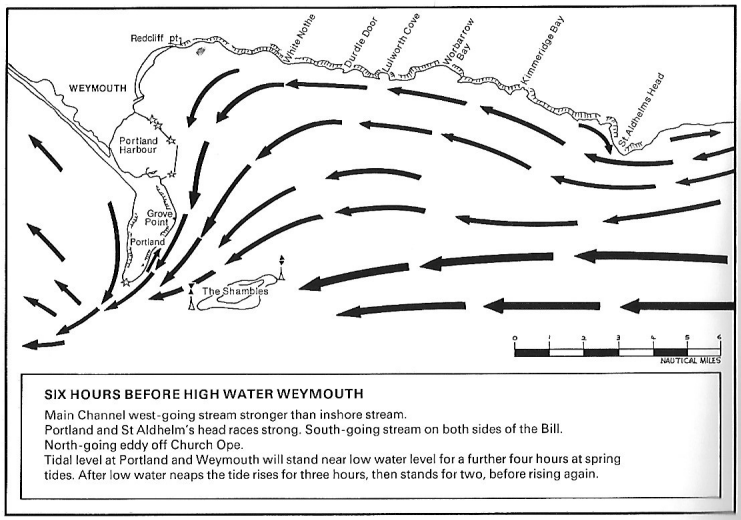
You sample particulates by extracting flue gas from a stack and collecting the material on a filter. When sampling for a gas, you extract the sample and collect the required substance into a solution. Or you absorb it onto a solid adsorbent, for example, activated carbon for volatile organic components.

Some substances exist simultaneously in both gaseous and particulate phases. Examples of this are organic pollutants such as dioxins and furans, and inorganic pollutants such as mercury.

The monitoring method you use must be able to sample the selected phase or both phases, as appropriate. For example, mercury is mainly present in gaseous form, but can also be found in a particulate phase. So a manual method to determine the concentration of total mercury requires a filter for the particulate phase and a series of absorbers for the gas phase.

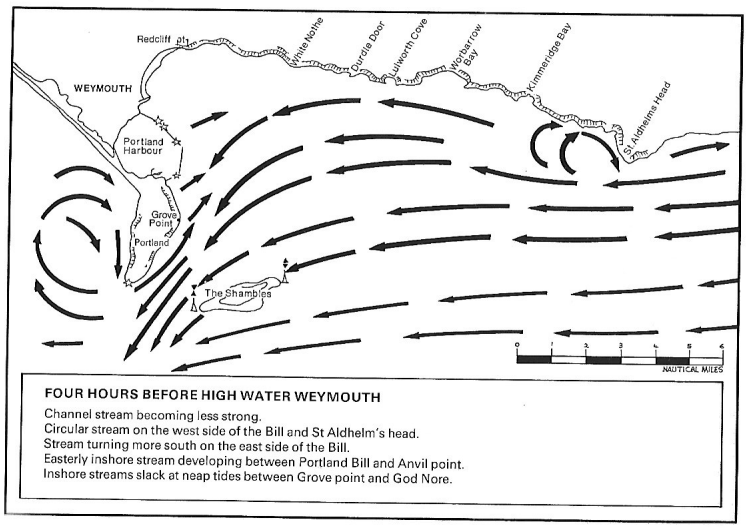
Ferry Bridge

Ferry Bridge is a bridge over the Smallmouth Passage, connecting Portland to Wyke Regis via the A354, the only road linking the island to the mainland. Ferry Bridge marks the point where the Fleet Lagoon joins Portland Harbour to the east by a narrow channel under the bridge. Overlooking the harbour side is Smallmouth Beach. The western region of the harbour, which faces the causeway, is a popular location for watersports due to its exposure to south-westerly winds.



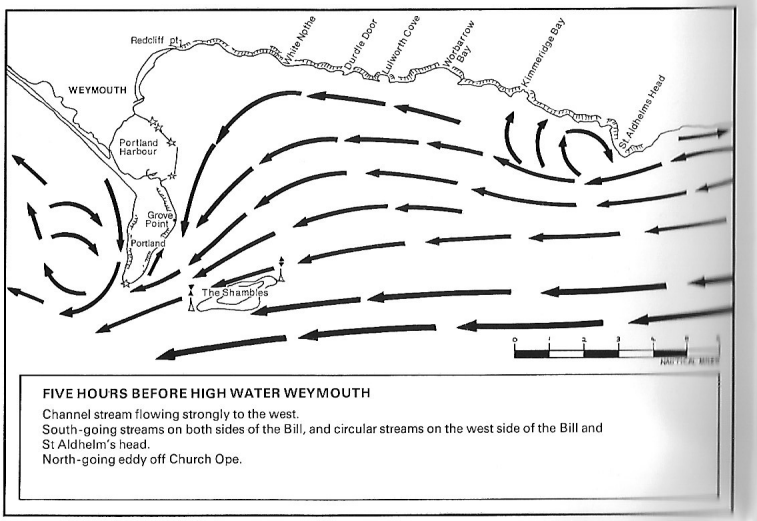
SIX HOURS BEFORE HIGH WATER WEYMOUTH

Main Channel west-going stream stronger than inshore stream.
Portland and St Aldhelm's head races strong. South-going stream on both sides of the Bill.
North-going eddy off Church Ope.
Tidal level at Portland and Weymouth will stand near low water level for a further four hours at spring tides. After low water neaps the tide rises for three hours, then stands for two, before rising again.



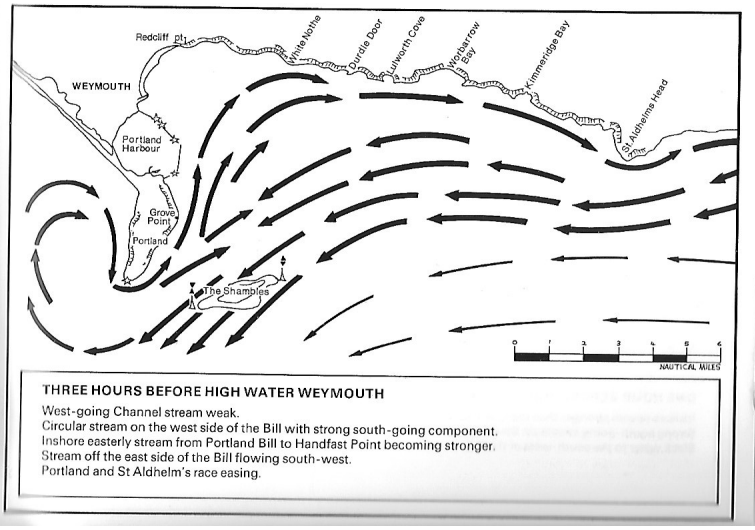
FOUR HOURS BEFORE HIGH WATER WEYMOUTH

Channel stream becoming less strong.
Circular stream on the west side of the Bill and St Aldhelm's head.
Stream turning more south on the east side of the Bill.
Easterly inshore stream developing between Portland Bill and Anvil point.
Inshore streams slack at neap tides between Grove point and God Nore.



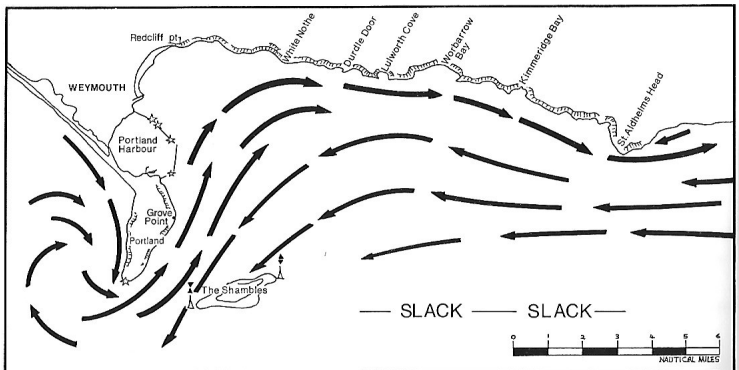
FIVE HOURS BEFORE HIGH WATER WEYMOUTH

Channel stream flowing strongly to the west.
South-going streams on both sides of the Bill, and circular streams on the west side of the Bill and St Aldhelm's head.
North-going eddy off Church Ope.



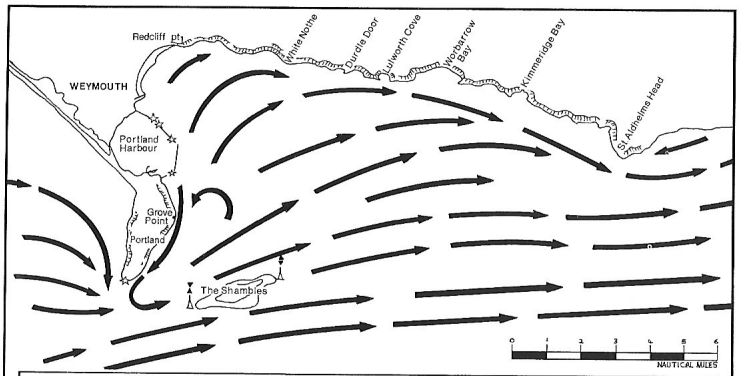
THREE HOURS BEFORE HIGH WATER WEYMOUTH

West-going Channel stream weak.
Circular stream on the west side of the Bill with strong south-going component.
Inshore easterly stream from Portland Bill to Handfast Point becoming stronger.
Stream off the east side of the Bill flowing south-west.
Portland and St Aldhelm's race easing.



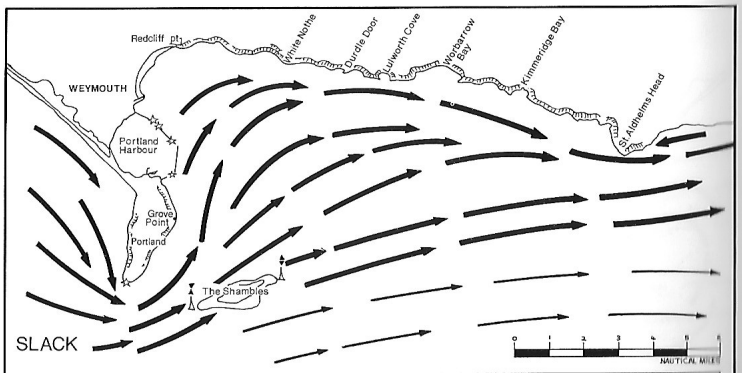
TWO HOURS BEFORE HIGH WATER WEYMOUTH

Channel stream slack.
Stream nearest shore flowing strongly north-east to east.
Stream further out flowing south-west to west.
Circular stream on west side of Portland Bill with strong south-going component.
West-going inshore stream at Winspit.



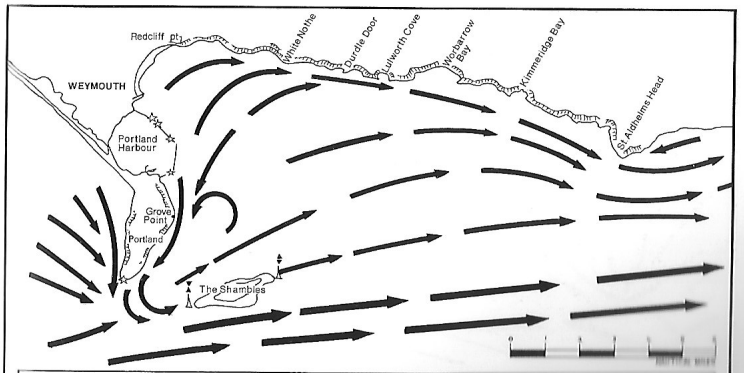
HIGH WATER WEYMOUTH

Channel and inshore streams of equal strength.
Strong south-going streams on both sides of the Bill.
Portland and St Aldhelm's races strong.
Anti-clockwise circular tide off Grove point.



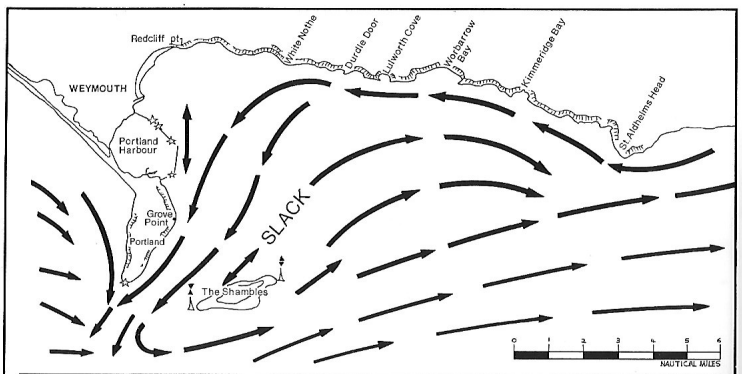
ONE HOUR BEFORE HIGH WATER WEYMOUTH

Inshore stream stronger than the Channel stream.
Strong south-going stream on the west side of the Bill.
Slack water to the south-west of the Bill.



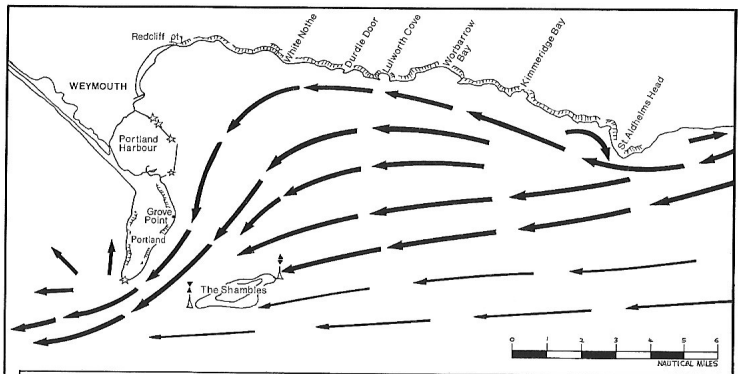
ONE HOUR AFTER HIGH WATER WEYMOUTH

Channel stream stronger than inshore stream.
South-going streams on both sides of the Bill.
Portland and St Aldhelm's races strong.
Circular tide on the east side of the Bill.



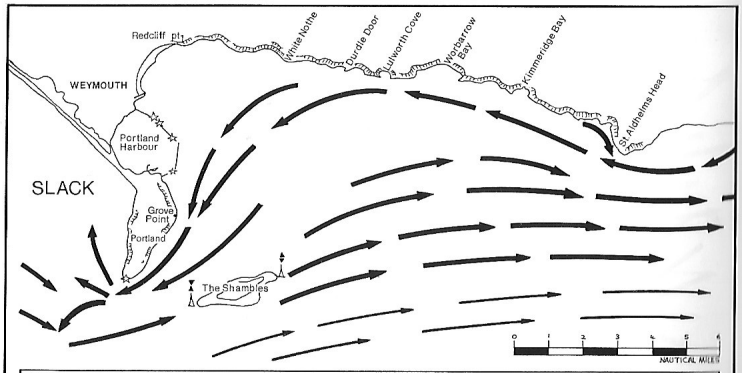
TWO HOURS AFTER HIGH WATER WEYMOUTH

Main Channel stream east-going and becoming less strong.
Inshore west-going stream flowing within a half mile of the shore as far as White Nothe where it breaks off to the south-west and broadens.
South-going stream on both sides of the Bill.
Portland and St Aldhelm's head races strong.



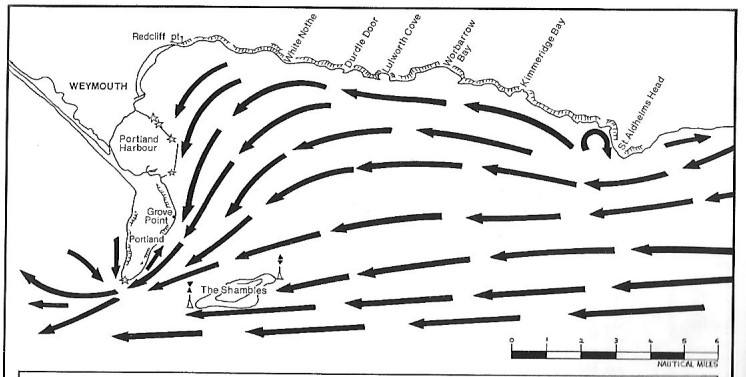
FOUR HOURS AFTER HIGH WATER WEYMOUTH

Channel stream weak west-going, or slack.
Inshore west-going stream running strongly.
North-going stream under the west side of the Bill.
East-going eddy formed to the west of Anvil point and St Aldhelm's head.



THREE HOURS AFTER HIGH WATER WEYMOUTH

East-going Channel stream weakening.
Strong inshore stream from Poole to Portland flowing westward.
Brief period of slack water between the Bill and Portland race.
South-going eddy on west side of St Aldhelm's head.



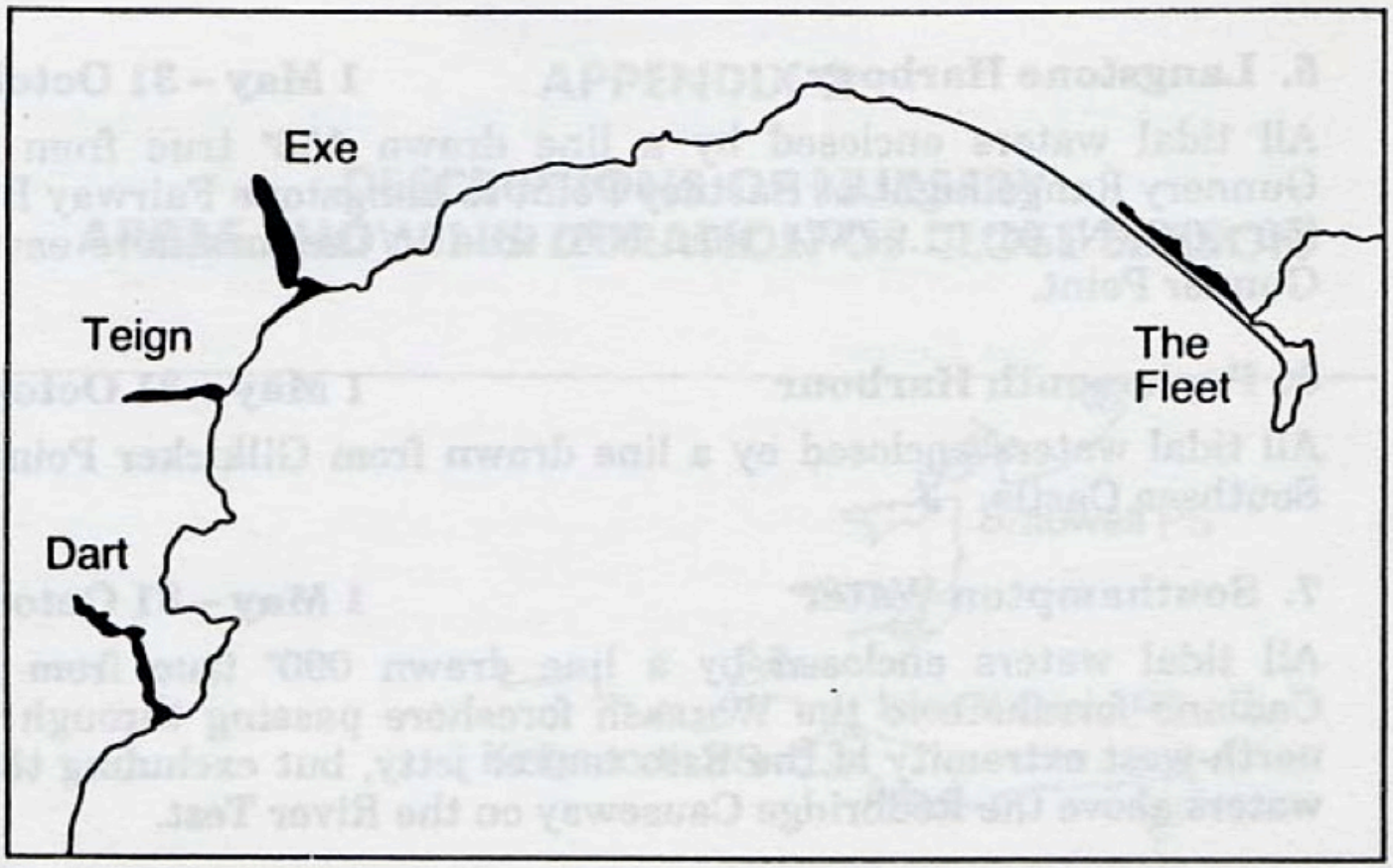
FIVE HOURS AFTER HIGH WATER WEYMOUTH

Inshore and Channel streams of equal strength.
South-going stream on west side of the Bill.
Portland and St Aldhelm's races becoming strong.
North-going eddy forming off Church Ope.
Circular stream to the west of St Aldhelm's head.

3.8.9. The Fleet (change)

The Fleet is a stretch of brackish water behind Chesil beach. The proposed extension of the existing BNA at The Fleet was to cover the whole Ferry Bridge Channel (Figure 9S). No sampling data were available, with only summary physical characteristics available for the whole of the Fleet (Table 4, Figure 7A and B). In 2015, landings by under 10 m vessels from the adjacent ICES rectangle indicated that 45 t of sea bass were retained representing 3% of the catch of all species (Figure 8).

Conclusion: There were no data on the fish assemblage compiled in this study for the Fleet extension so there is insufficient evidence at present to support the proposed BNA (Table 5). More data are required before a BNA designation could be considered.



10. The Fleet **All year**

All tidal waters of the Fleet inside Ferry Bridge.


Chesil Cove and Stennis Ledges are toward the eastern end of Chesil Bank. Subjected to south-westerly Atlantic swell and regular storms, these high-energy areas support sturdy and robust wildlife capable of withstanding the forces of nature.
Chesil Beach is a popular angling location throughout the year and commercial boats still operate from Chesil Cove.
[Image credit - Jim Elwood, Creative Commons CC]

Sailing

Portland isn't just good for sailing, it could well be considered as the best place for sailing in the United Kingdom, if not Europe. With the Natioanal Sailing Academy sitting on the harbour and the 2012 games sailing events held in Portland it would be hard to disagree with these statements, indeed the Royal Yachting Association has also credited the area as the best in Northern Europe.

There is a huge amount of dinghies and larger keel boats that both use the waters for recreation and for competition. Last year alone saw competitions for Optimists, Darts, RS500, 600, 700 and 800, 18ft Skiffs, Moths, F18s, B14s, Laser 4000s and many others.

To sum up, if you have an interest in sailing or wish to give it a go for the very first time you would be hard pushed to find a better place. The geography of the area is already acknowledged as one of the best and the National Sailing Academy offer instruction for both novice to expert alike. For more information on what the National Sailing Academy could offer you please visit their website.

Why is the site important?

MCZs, together with other types of marine protected areas, will form the UK contribution to an international network of protected sites in the north east Atlantic. The network will help to deliver the government's vision of clean, healthy, safe, productive and biologically diverse oceans and seas. MCZs protect typical, rare or declining habitats and species found in our seas.

The Chesil Beach and Stennis Ledges MCZ provides a wide range of seabed habitats that support a great variety of species. The rocky habitats are rich in plants and animals such as sponges, sea squirts, bivalve molluscs (such as mussels and native oysters), and also support commercially important crustaceans (such as lobsters and crabs).

Sediments including gravels, pebbles and coarse sands are found within the intertidal area of the site. This habitat supports tiny shrimp-like creatures that are able to live within this unstable sediment and tolerate exposure to the air, and these provide an important feeding source for wading birds.

The softer sediments within the site provide habitats for a wide variety of animals that live on the sediment, for example flat fish, starfish and sea urchins, and also those that live within the sediment, such as bristleworms, burrowing anemones and venus clams. Sediment habitats provide nursery grounds for many ecologically and commercially important fish species.

Pink sea-fan is a type of soft coral found within the site. It is made up of colonies of tiny anemone-like creatures that attach to rocky sea bed habitats and never move during their adult lives. It is an extremely slow-growing species and is therefore very sensitive to damage.

Designation of this site as a Marine Conservation Zone protects the following features. You can find detailed information about each feature at http://jncc.defra.gov.uk/page-4527.

Department for Environment, Food and Rural Affairs

Chesil Beach and Stennis Ledges Marine Conservation Zone

This document sets out why this site is important, the features protected and general management information.

31 May 2019

Intertidal coarse sediment on Chesil Beach © Natural England

Why do biodiversity net gain now?

The Environment Act 2021 makes biodiversity net gain mandatory for all but small sites and some exemptions from an as-yet unconfirmed date in January 2024 and for small sites from April 2024. Councils will need to be ready to meet the new legal requirements then – so why should you start thinking about biodiversity net gain now?

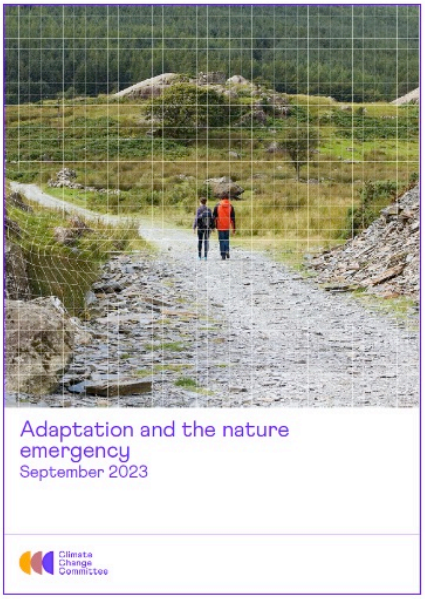
BNG is already required through national planning policy in England and Wales, and can be achieved on site, off site, or through a combination of on-site and off-site measures. You can find more information about this on our **Biodiversity net gain now and in the future** page.

There is a lot of preparation required to get ready for the new legal requirements, including planning decision-making and policy, but it's also worth thinking beyond the essentials:

- BNG is **not just about planning**. You could start thinking now about how you could **join up across council services**.
- Have you declared **a climate and ecological emergency**? BNG is an action you can take in your plan to address these twin emergencies.
- BNG links into **place-making and infrastructure** and you can start thinking and gathering evidence now about:
  - what you want your borough's natural environment to look like, and
  - how the natural environment can deliver for local people.
- Local Nature Recovery Strategies (LNRS) will be produced at the county, unitary or combined authority level and there will be other opportunities associated with **working with neighbouring authorities** on BNG.
- BNG will involve **local communities, landowners and farmers**, especially where delivery of BNG happens off the development site.
- Defra and Natural England are developing policy and secondary legislation on BNG, so you can **test approaches and feed in experience** if you start doing BNG now.
- BNG will need **expertise and resourcing**, so it is worth considering what you will need now.
- There are concerns that there will a **rush of non-BNG planning applications** before it becomes mandatory in those areas that haven't already implemented BNG, so you can avoid this if you start now.

This **article** in LGA's first magazine highlights why councils should start thinking about and planning for biodiversity net gain now.

Adaptation and the nature emergency



Download this report
788KB

1. Outline

The Welsh Government commissioned the Committee to advise on the "interrelationships between climate change adaptation and the nature emergency". This briefing considers how adapting to a changing climate strongly aligns with the actions needed to address the nature emergency, and describes how synergies can be captured across policy objectives and trade-offs managed.

2. Key messages

We outline eight principles for jointly addressing the nature and climate emergencies.

1. **Set out a vision and supporting strategy for a healthy, resilient natural environment in Wales.** The next national adaption plan in 2024 is a key opportunity to set out the vision for what adaption in Wales should achieve and should include a framework of associated targets.
2. **Support nature to adapt to climate change.** This includes: making space for nature and the ecological processes underpinning ecosystem health; creating opportunities for species to disperse across landscapes; restoring and connecting habitats; and enhancing the diversity and condition of native species and habitats, where appropriate.
3. **Reduce other pressures on nature.** Through reducing habitat loss, reversing degradation, minimising pollution, preventing unsustainable use, controlling pests and diseases, and working to eliminate invasive non-native species.
4. **Identify suitable nature-based solutions (NbS) to support climate and nature goals.** NbS interventions can include: restoring coastal ecosystems and native vegetation in catchments to improve biodiversity and moderate peak flows; bringing nature into cities;

Our research programmes

Joint Defra / Environment Agency Flood and Coastal Erosion Risk Management (FCERM) Research and Development Programme

Find out about the FCERM Research and Development programme.

Environment Agency Air, Land and Water Research Programme

The programme has 6 themes:

- catchment management – supporting river basin planning including catchment-based science and hydromorphology
- land and water quality – impacts, risks and control of pollution in soil, groundwater and surface water
- fisheries and biodiversity – protecting and managing aquatic species, including monitoring and diagnostic tools
- regulated industry – supporting permitting and guidance with a focus on air quality and nuclear regulation
- climate change – understanding the impacts of climate change and supporting adaptation and resilience in business and the environment
- resource use – the sustainable management of natural resources including water supplies and solid wastes

The King Charles III England Coast Path (ECP) is a new national trail being created by Natural England. For the first time people will have the right of access around all of our open coast.

As part of this work a coastal margin is being identified which includes all land seaward of the trail. Much of the coastal margin is open access land under the Countryside and Rights of Way Act 2000 (CROW Act).

How your coastal land is affected

Natural England must:

- aim to strike a "fair balance" between your property interests and the public's rights to enjoy open-air recreation on coastal land

Coastal access won't:

- take the ownership of your land away from you - you can still manage your land as you see fit
- create new public rights through your private space around houses such as gardens
- interfere with any businesses you run on your coastal land unnecessarily

GOV.UK

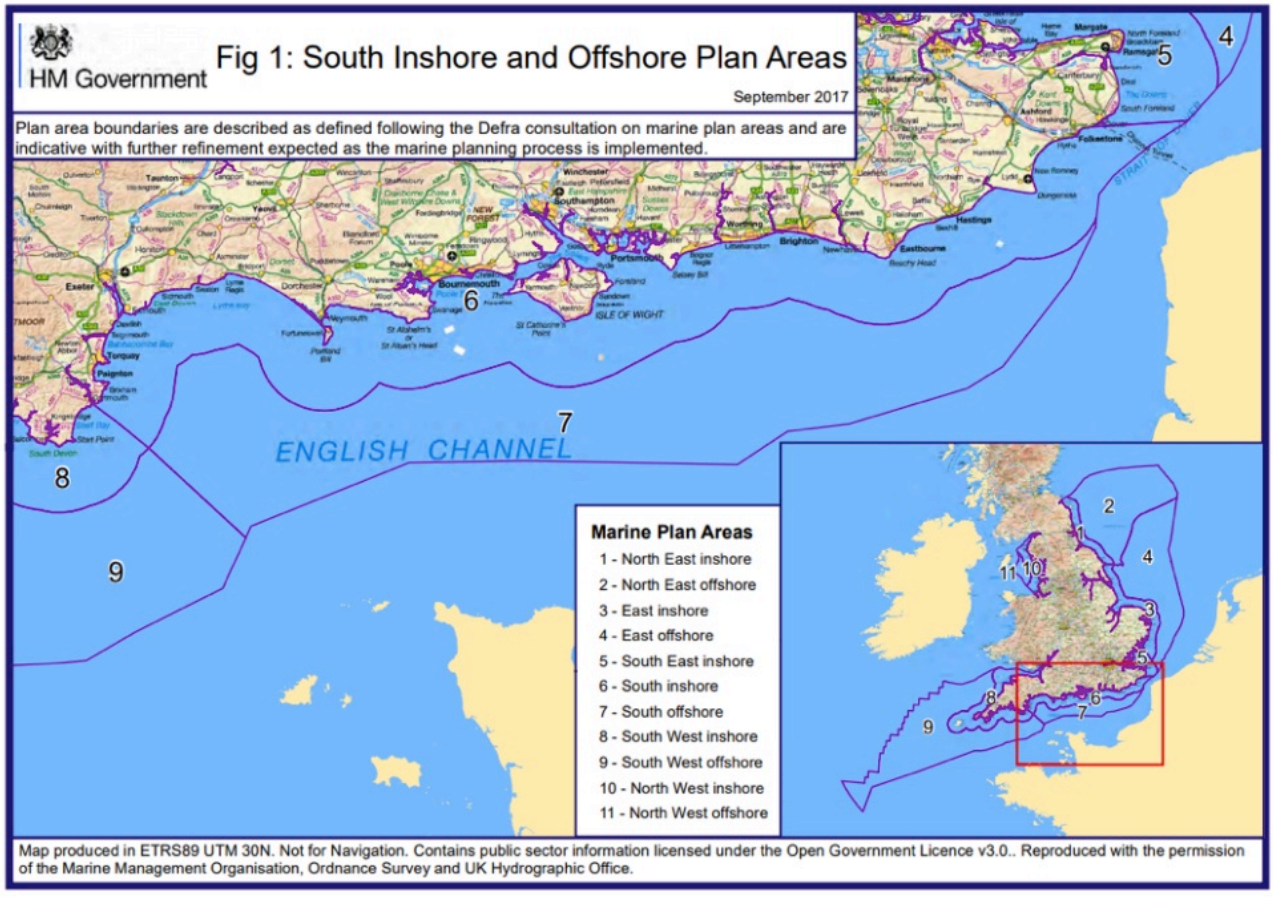
Guidance

Marine Protected Areas (MPAs)

The Marine Management Organisation (MMO) is responsible for managing fishing and marine non-licensable activities in England's marine protected areas (MPAs).

From: Marine Management Organisation
Published 13 March 2023

The South Inshore and Offshore Plans were combined into the second English marine plan to be adopted. It covers an area of around 20,000 square kilometres of inshore and offshore waters across 1,000 kilometres of coastline from Folkestone to the river Dart. The South Inshore Marine plan area cover the area from the mean high water spring tide out to 12 nautical miles. The area includes the UNESCO world heritage Jurassic coast and contains a diverse range of habitats and species. The South Offshore Plan area covers the area from 12 nautical miles to the maritime borders with France and the Channel Islands, totalling approximately 10,000sq km.



South Inshore and South Offshore Marine Plan

1 The South Marine Plan

1.1 Overall aims

1. The South Marine Plan introduces a strategic approach to planning within the inshore and offshore waters between Folkestone in Kent and the river Dart in Devon. It provides a clear, evidence-based approach to inform decision-making by marine users and regulators on where activities might take place within the marine plan area.

2. The plan applies national policies in a local context, ensuring that the needs and aspirations of the marine plan area are reflected. To achieve this, the marine plan has been developed in consultation with stakeholders and in conjunction with government.

3. The plan will enable activities to move more quickly from concept to consent by identifying areas suitable for investment, encouraging earlier and clearer communication between developers and regulatory decision-makers, and by early identification of proposals that are inappropriate or unfeasible.

4. Implementation of the plan's objectives, through more informed decision- making, will help to ensure that we optimise use of the marine area's natural capital, realising greater protection of vulnerable habitats and species, and natural defences against climate change and flooding, as well as improving the well-being of coastal communities and supporting a stronger marine economy.

3 Using and implementing the South Marine Plan

29. This section provides guidance on how to use and implement the South Marine Plan. Applicants, those developing a proposal, and third parties, such as advisors, as well as public authorities, should consider the South Marine Plan where relevant. It is the responsibility of the user to determine whether and to what extent the policies are relevant, and to apply them to a proposal in the context of their own processes and current practice.

3.1 Specific plan policy considerations

30. The marine plan policies affect different types of decision including not only 'authorisations', such as those similar to plan-based permitting, but also those which are not 'authorisation' decisions that are capable of affecting the marine area, eg making of bye laws in the management of marine protected areas. As such, the term "proposals" is used where appropriate in the plan policies to encompass the range of activities that could require a decision including those that have no formal "application" process as well as those that do. Plan policies can therefore apply to new developments, uses, management measures and other activities, and in the review of existing activities, authorisations or measures.

31. The South Marine Plan addresses overall and specific issues of the south marine plan areas. As the issues vary in impact and priority, the policy text has been written to reflect this. Public authorities and applicants should note whether a policy uses 'must/will' or 'should'. 'Must' or 'will' provides strong direction and greater certainty. 'Should' is used where greater flexibility is required, for example in relation to proportionality. This is consistent with the language used in the Marine Policy Statement.

32. A number of South Marine Plan policies require proposals to demonstrate that they will a) avoid, b) minimise or c) mitigate impacts on other users or the environment. Policies with steps a) to c) indicate that proposals should not proceed unless criteria in a) to c) are met in order of preference. In other words proposals cannot proceed to b) unless they have first demonstrated why they cannot meet a) and likewise cannot proceed to c) unless they have first demonstrated why they cannot meet a) and b).

Guidance

Managing marine non-licensable activity in Studland Bay Marine Conservation Zone

This page details the MMO's work on the management of marine non-licensable activity in Studland Bay Marine Conservation Zone (MCZ).

From: Marine Management Organisation

Published 18 February 2021

Last updated 5 June 2023 — See all updates

Find out about the different marine species and how they are protected UK wildlife legislation.

From: Marine Management Organisation
Published 11 June 2014
Last updated 13 June 2023 — See all updates

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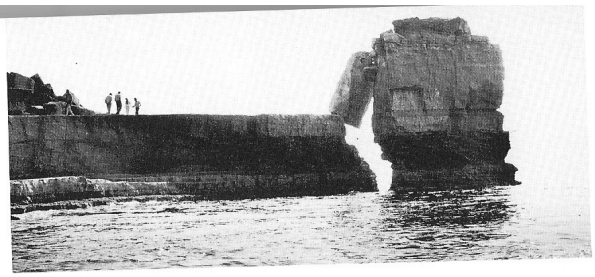
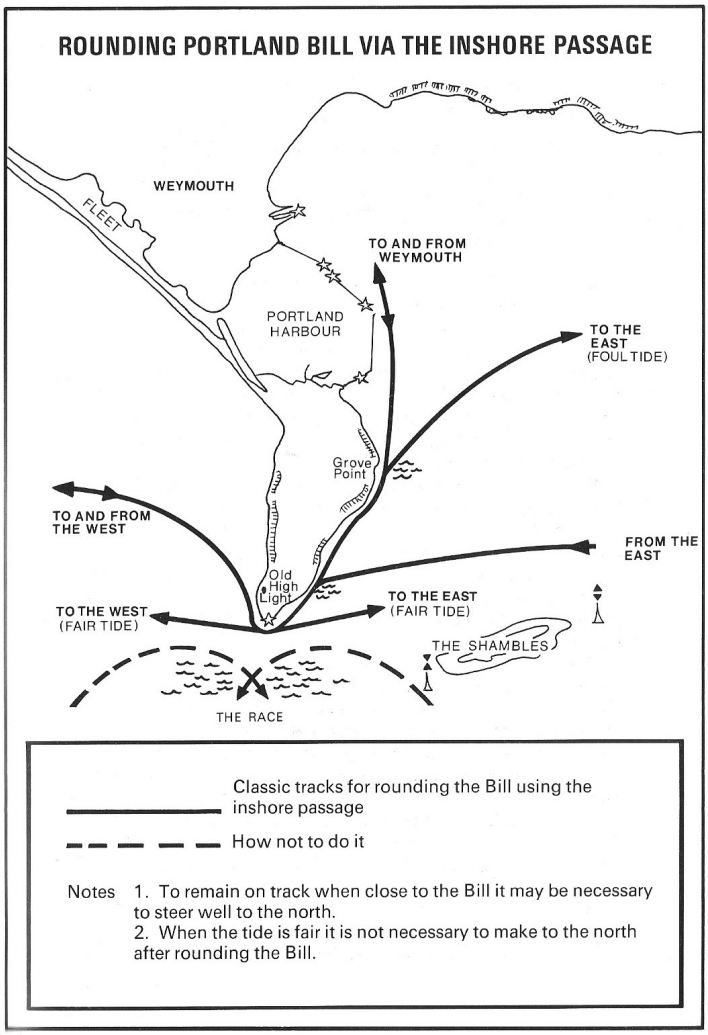


Plate 104. Pulpit rock.

About one third of the distance along the south-west facing shore of the Bill there is another larger rock amongst others called the Snail, which gives its name to this same shore between the Bill and Pulpit rock (Plate 104). There is deep water close to Pulpit rock, but even so due regard should be paid to the south-going Lyme bay tidal stream which fairly sizzles past. Both the tip of the Bill and the area round the corner provided the stone for the government buildings of Whitehall in London, hence the local name Whitehall for the 200 m stretch of coast to the north of Pulpit rock.

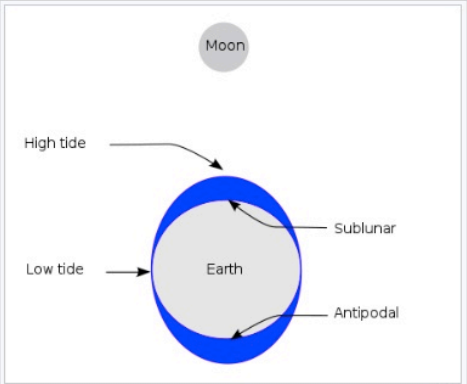
There is, of course, a radio beacon at Portland Bill lighthouse, transmitting PB on a frequency of 291.9 kHz. The light flashes through most of the visible arc four times every 20 seconds, but there is a reducing number of flashes in sectors marked on the chart at either side of the Bill. The red sector light encompassing the Shambles comes from the lowest lighthouse window on the east side. Incidentally Portland Bill light is due south (True) of the Old High lighthouse.

The Admiralty chart of 1863 describes the Portland race as 'a periodical commotion of the sea which rages with great violence'. Even if it cannot be seen in darkness or fog, it can be heard some miles away; as Adlard Coles put it: 'like the rumble of a distant train'. It must be said that Portland race should be treated seriously, and on many occasions the only wise choice is to pass between 2 and 5 miles to the south of the Bill, depending upon the severity of the weather. The race is formed by a confliction of the strong Channel tide running over a dramatically steep ledge containing caverns as big as a cathedral, so divers say, and strong currents running south for 9 hours out of 12 on either side of the Bill. The race moves, as one would expect, from one side of the ledge to the other dependent upon the direction of the Channel stream. The most dangerous seas occur, as might also be expected, with spring tides and



Tides are the rise and fall of sea levels caused by the combined effects of the gravitational forces exerted by the Moon (and to a much lesser extent, the Sun) and are also caused by the Earth and Moon orbiting one another.

Tide tables can be used for any given locale to find the predicted times and amplitude (or "tidal range"). The predictions are influenced by many factors including the alignment of the Sun and Moon, the phase and amplitude of the tide (pattern of tides in the deep ocean), the amphidromic systems of the oceans, and the shape of the coastline and near-shore bathymetry (see *Timing*). They are however only predictions, the actual time and height of the tide is affected by wind and atmospheric pressure. Many shorelines experience semi-diurnal tides—two nearly equal high and low tides each day. Other locations have a diurnal tide—one high and low tide each day. A "mixed tide"—two uneven magnitude tides a day—is a third regular category.[1][2][a]



Simplified schematic of only the lunar portion of Earth's tides, showing (exaggerated) high tides at the sublunar point and its antipode for the hypothetical case of an ocean of constant depth without land, and on the assumption that Earth is not rotating; otherwise there is a lag angle. Solar tides not shown.

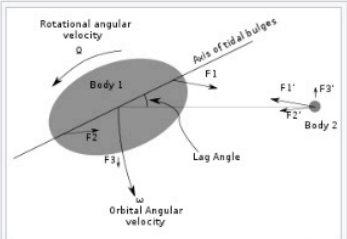
Tides vary on timescales ranging from hours to years due to a number of factors, which determine the lunitidal interval. To make accurate records, tide gauges at fixed stations measure water level over time. Gauges ignore variations caused by waves with periods shorter than minutes. These data are compared to the reference (or datum) level usually called mean sea level.[3]

While tides are usually the largest source of short-term sea-level fluctuations, sea levels are also subject to change from thermal expansion, wind, and barometric pressure changes, resulting in storm surges, especially in shallow seas and near coasts.

...

Lunar distance

The changing distance separating the Moon and Earth also affects tide heights. When the Moon is closest, at perigee, the range increases, and when it is at apogee, the range shrinks. Six or eight times a year perigee coincides with either a new or full moon causing perigean spring tides with the largest *tidal range*. The difference between the height of a tide at perigean spring tide and the spring tide when the moon is at apogee depends on location but can be large as a foot higher.[12]



Earth's rotation drags the position of the tidal bulge ahead of the position directly under the Moon showing the lag angle

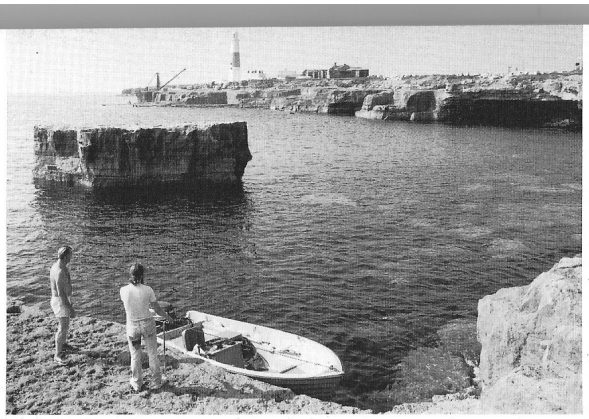


Plate 101. Collar's ledge and Robinson Crusoe island.

The shore area at Butts is also called Red Pool after a rock pond at the back of the ledge, which sometimes turns red through lying stagnant between spring tides. It was here that the trawler *Marguerita* went ashore in a gale in 1946 with the loss of her Danish crew, and at low water spring tide bits of ship can be seen from the cliff.

The next ledge, with no easy landing, is called Long Points which, as its name implies, has submerged extensions. However the subsequent ledge, lying due south of the Old Low lighthouse, called Collar's ledge, has good landing places on both sides at mid-tide, though nothing at all to tie up to (Plate 101). The flat-topped island

Plate 102. Red Crane, Mugley's plain and Boathaul.

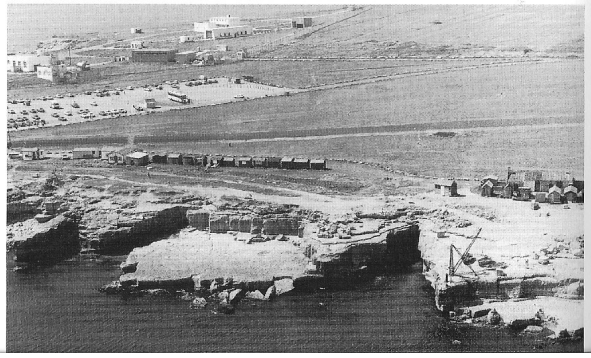


Plate 103. The tip of the Bill.

to the south is called Robinson Crusoe island, and the beach behind is called Pom Pom.

The most southerly of the fishing boat derricks which fishermen have been using since 1873, called Red Crane (Plate 102), stands on the next promontory. There are 2 or 3 m under the crane jib at high water, a smooth alongside position, shaped to take a boat, and access by a chain hanging from the cliff with adjacent footholes. The flat ledge called Mugley's plain to the south of Red Crane ends at a gap in the rock called Boathaul, where long ago some sort of boathaul system once operated. There is a narrow beach at the end of Boathaul where the slightest swell will build up and break.

If rounding the Bill really close, the outermost drying rock to be encountered is in line with the lighthouse and the 18 m high Trinity house obelisk, erected in 1844, on 020° Mag (Plate 103). This was the rock that surprised a number of competitors in the ill-fated 1979 Fastnet race. When the top window of the lighthouse is in view above the obelisk from an open boat one is clear of the rock.

New contracts [edit]

The Ministry of Transport and Communications in Norway announced in 2017 that the Hurtigruten contract was split into three contracts. The contracts were put up for bid and in the end, two were granted to Hurtigruten AS and one to Havila Kystruten AS, with each operating seven and four ships respectively. The two companies will alternate departure days for the entire route from Bergen to Kirkenes.[8]

Havila Kystruten AS is building four new vessels to serve the route, while Hurtigruten AS will be refitting seven of its vessels to meet the stricter emissions requirements.[8]

The four new vessels from Havila will run on LNG and battery power. LNG will cut CO_2 emissions by 25 per cent, and the battery power will yield additional savings.[9] The vessels will be named Havila Capella, Havila Castor, Havila Polaris and Havila Pollux. All four vessels were built at Tersan shipyard in Turkey.[10]

Existing vessels from Hurtigruten will be modernized and renovated in order to meet the new requirements.[8] MS Eirik Raude, MS Trollfjord and MS Otto Sverdrup are all getting modernized and renovated with a scandinavian interior style similar to the expedition vessels MS Roald Amundsen and MS Fridtjof Nansen.[*citation needed*]

The ships will be fitted with filters and LNG compatible engines in order to reduce emissions by 25%. The ships will also get hybrid motors, and battery packs.[*citation needed*]

Our strategy

National Grid ESO is at the heart of the transformation to a fully decarbonised electricity system by 2035, while continuing each day to reliably and safely move electricity across Great Britain second by second.

Our Mission

Our mission is to drive the transformation to a fully decarbonised electricity system by 2035 which is reliable, affordable and fair for all.

This aligns to the 2035 government target of a decarbonised power system. It's important to note that although the mission only mentions electricity, as per our current license and operational remit, we recognise that an industry-wide, whole-system approach will be needed to achieve the government target. We also understand that the acceleration of wider industry and societal change is necessary to deliver this target.

1. Introduction

1. The development of, and production from, oil and gas fields in the United Kingdom's territorial waters and on the United Kingdom Continental Shelf ('**UKCS**') is subject to a licensing regime overseen by the Oil and Gas Authority ('**OGA**'). Under the model clauses applicable to a seaward production licence, licensees require the OGA's consent to erect or carry out permanent works for the purpose of getting or conveying petroleum from a licensed area or to get petroleum from such an area. Such consent is referred to as a 'Development and Production Consent'.

2. The document submitted in support of an application by a licensee for authorisation to proceed with a proposed development is referred to as a Field Development Plan ('**FDP**'). The FDP is the pre-requisite for the OGA's development and production considerations and should provide a description of the technical and economic information on which the development is based.

3. When considering whether to consent to an FDP, the OGA will, amongst other things, assess whether the proposed project accords with the obligations set out in the strategy for enabling the principal objective of maximising the economic recovery of UK petroleum ('**MER UK Strategy**'), and whether the development methods proposed comply with good oilfield practice.

Scope and purpose of the document

4. This document is intended to assist those involved in the planning of a new field development and subsequent consent to an FDP leading to production of first hydrocarbons. The guidance covers the following:

   - An overview of the OGA's objectives and considerations relevant to all new field developments
   - The Assessment Phase leading to the Concept Select
   - The Authorisation Phase leading to the consent to a Field Development Plan
   - The Execute Phase leading to the production of hydrocarbons
   - The process for revising a previously consented-to FDP (i.e. an FDP Addendum ('**FDPA**'))

5. This guidance is not a substitute for any regulation or law and is not legal advice. It does not have binding legal effect. Where the OGA departs from the approach set out in this guidance, the OGA will endeavour to explain this in writing to the person seeking a decision from the OGA.

picocyanobacteria after 4 days of exposure to aerosol inputs. Dinoflagellates, unicellular microorganisms associated with harmful algal blooms, also benefit from Asian Fe- and N-enriched aerosols, and therefore, an increase in anthropogenic aerosol emissions could lead to more algal bloom events in the future [101].

Liao et al. [102] found high trace metal concentrations, namely Fe, Mn, Zn, and Cu, in phytoplankton collected in the open ocean region of the Western Philippine Sea, which was assigned to anthropogenic aerosols from eastern Asia. For these elements, the size-fractioned plankton ratios were significantly higher than the reference intracellular ratios and lithogenic ratios (normalized to Al), suggesting a possible influence of extracellular adsorption or aggregation on plankton and the role of aeolian deposition of anthropogenic particles generated from fossil fuel burning in East Asia, respectively. Similarly, Liu et al. [103] reported the presence of fine particulates with a diameter of approximately 1 μm ($PM_{1.0}$) in sea anemones, which are released from fossil fuel combustion into the air. These marine organisms are suspension/filter feeders and, therefore, can incorporate and accumulate suspended particles, including $PM_{1.0}$ particles, in their bodies. The same research team reported that the bioaccumulation factor of $PM_{1.0}$ in sea anemones was approximately 5–7 orders of magnitude. Furthermore, a maternal transfer of $PM_{1.0}$ was also suggested based on the existence of PM in sea anemone eggs and juveniles, suggesting that fine PM accumulation in marine biota is a long-lasting issue once it occurs [103]. The study of Liu et al. [103] also highlight that the hazardous fine PM may pose a serious risk to other marine organisms via the food web. In another study carried out in six coastal areas from the south of China (i.e., suburban industrial, suburban agricultural, and four urban areas), $PM_{2.5}$ samples were collected and used as a simulation of wet deposition scenarios for exposure to the marine fish, the medaka *Oryzias melastigma*. Significant changes were observed in the fish gut microbiome diversity and lipid metabolism, consequently inducing a decrease in medaka growth [104]. It was also concluded that the $PM_{2.5}$ samples from the industrial site with higher concentrations of Zn and Cr exert significant impacts than $PM_{2.5}$ from the agricultural location that exhibit lower Zn and Cr concentrations [104].

Coral reefs are another example of a key marine ecosystem whose decline can be also exacerbated by the deposition of African dust [38]. In order to study the impact of Sahara dust deposition in the coral diseases at the Caribbean Sea, Hunter et al. [38] applied an association rule data mining (ARDM) algorithm alongside a combination of satellite remote-sensing and in situ data to establish a relationship between Saharan dust storms, Caribbean climate, and the prevalence of coral diseases. It was reported that the ARDM algorithm indicated a relationship between the African dust and coral disease observations in the Caribbean Sea, modulated by the sea surface temperature. The findings of Hunter et al. [38] support the assumption that African dust plays an important role in coral reef diseases alongside the sea surface temperature. This study also reported that the diffuse attenuation coefficient at 490 nm (K490), which is an important water property related to light penetration and availability in aquatic systems, and the Chl-a are not statistically significant parameters concerning the coral disease observations. It has been shown, however, that both Chl-a and K490 values are marginally influenced by the concentration of UV-absorbing aerosols [38]. Nutrient (N and P) enrichment in oceans can indirectly compromise coral health mostly by increasing the incidence and severity of coral diseases (e.g., white spot disease, white pox, aspergillosis) and predation susceptibility, affecting the population dynamics and ultimately causing corals mass extinction [75]. Therefore, all scenarios of increasing soluble forms of nutrients in worldwide oceans pose serious and real risks for the marine ecosystems [75], since corals are amongst the most ecologically and economically relevant marine ecosystems [105].

Total PM to $PM_{2.5}$

3.21 $PM_{2.5}$ denotes airborne particulate matter with an aerodynamic diameter of less than 2.5 micrometres. PM_{10} denotes airborne particulate matter with an aerodynamic diameter of less than 10 micrometres. PM denotes total airborne particulate matter. Thus, PM_{10} is a subset of PM, while $PM_{2.5}$ is a subset of PM_{10}. PM emissions from EfW facilities in the UK are controlled using fabric filters. This type of filter medium has been shown to have a high collection efficiency for large particles (Jones and Harrison (2016)). The available evidence on particle size distributions thus suggests that almost all PM emitted from such facilities is likely to be in the form of $PM_{2.5}$ (and thus also PM_{10}) (Buonanno et al. (2009)). Particle size distributions can change following release from stacks; for example smaller particles may coagulate together to form larger particles. Such effects are not considered in this study. It has thus been assumed that the $PM_{2.5}$ concentration is the same as the total PM concentration, with the same being the case for the PM_{10} concentration.

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Plankton

91 languages

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From Wikipedia, the free encyclopedia

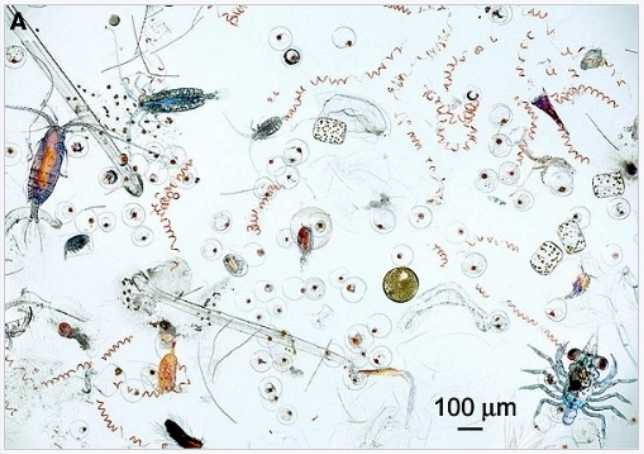
This article is about the marine organisms. For other uses, see Plankton (disambiguation).

Plankton are the diverse collection of organisms found in water (or air) that are unable to propel themselves against a current (or wind).[1][2] The individual organisms constituting plankton are called **plankters**.[3] In the ocean, they provide a crucial source of food to many small and large aquatic organisms, such as bivalves, fish, and baleen whales.

Marine plankton include bacteria, archaea, algae, protozoa and drifting or floating animals that inhabit the saltwater of oceans and the brackish waters of estuaries. Freshwater plankton are similar to marine plankton, but are found in lakes and rivers. Mostly plankton just drift where currents take them, though some, like jellyfish, swim slowly but not fast enough to generally gain control from the influence of currents.

Although plankton are usually thought of as inhabiting water, there are also airborne versions that live part of their lives drifting in the atmosphere. These *aeroplankton* include plant spores, pollen and wind-scattered seeds. They may also include microorganisms swept into the air from terrestrial dust storms and oceanic plankton swept into the air by sea spray.

Though many planktonic species are microscopic in size, *plankton* includes organisms over a wide range of sizes, including large organisms such as jellyfish.[4] This is because plankton are defined by their ecological niche and level of motility rather than by any phylogenetic or taxonomic classification. The "plankton" category



Marine microplankton and mesoplankton

Part of the contents of one dip of a hand net. The image contains diverse planktonic organisms, ranging from photosynthetic cyanobacteria and diatoms to many different types of zooplankton, including both holoplankton (permanent residents of the plankton) and meroplankton (temporary residents of the plankton, e.g., fish eggs, crab larvae, worm larvae).

Nanophytoplankton

1 language

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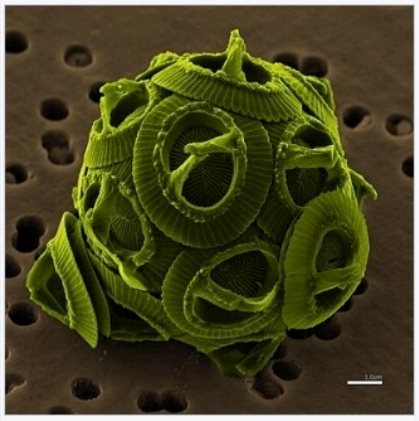
Nanophytoplankton are particularly small phytoplankton with sizes between 2 and 20 μm. They are the autotrophic part of nanoplankton. Like other phytoplankton, nanophytoplankton are microscopic organisms that obtain energy through the process of photosynthesis and must therefore live in the upper sunlit layer of ocean or other bodies of water. These microscopic free-floating organisms, including algae, and cyanobacteria, fix large amounts of carbon which would otherwise be released as carbon dioxide.[1] The term nanophytoplankton is derived from the far more widely used term nannoplankton/nanoplankton.



False-color scanning electron micrograph of *Gephyrocapsa oceanica*

Part of a series on

Ecosystem role [edit]

Phytoplankton form the beginning of the food chain for aquatic animals. Zooplankton and krill feed on nanophytoplankton, and are then eaten by whales, seals, birds, fish, squid, and other organisms.[2]

Life cycle [edit]

Populations are low in the winter, when nutrients are high, and then the populations increase as the nanophytoplankton consume nearly all of the nutrients, reach their carrying capacity, and decline in number at the end of the summer, beginning the cycle again in the winter. However, nanophytoplankton have different

Effect on global warming [edit]

Continued global warming will significantly alter the food chain on Earth. With nanophytoplankton and phytoplankton at the base of the food chain, their decreased productivity from increased UV-B radiation from ozone depletion will provide less food for krill and subsequent organisms in the food chain. Antarctica has experienced up to 50% ozone depletion, harming nanophytoplankton located here the most. Through carbon fixation, nanophytoplankton absorb carbon from the atmosphere, and with depleting populations, more carbon is left in the air, contributing to more global warming and ozone depletion. The cycle then continues. However, some scientists believe that existence of nanophytoplankton contributes to further progression of global warming, because they absorb the sun's radiation that would otherwise be reflected back into space. Despite the controversy, it is evident that nanophytoplankton, despite their minimal size and apparent irrelevance because they are hardly visible, are an integral part of sustaining life on Earth.[7]

Tyre particles are contaminating our rivers and ocean, study says

New report reveals tyres are a major source of microplastics found in the marine environment.

From: Department for Environment, Food & Rural Affairs and Rebecca Pow MP
Published 27 May 2020

The research advances understanding of ways in which microplastics enter the marine environment.

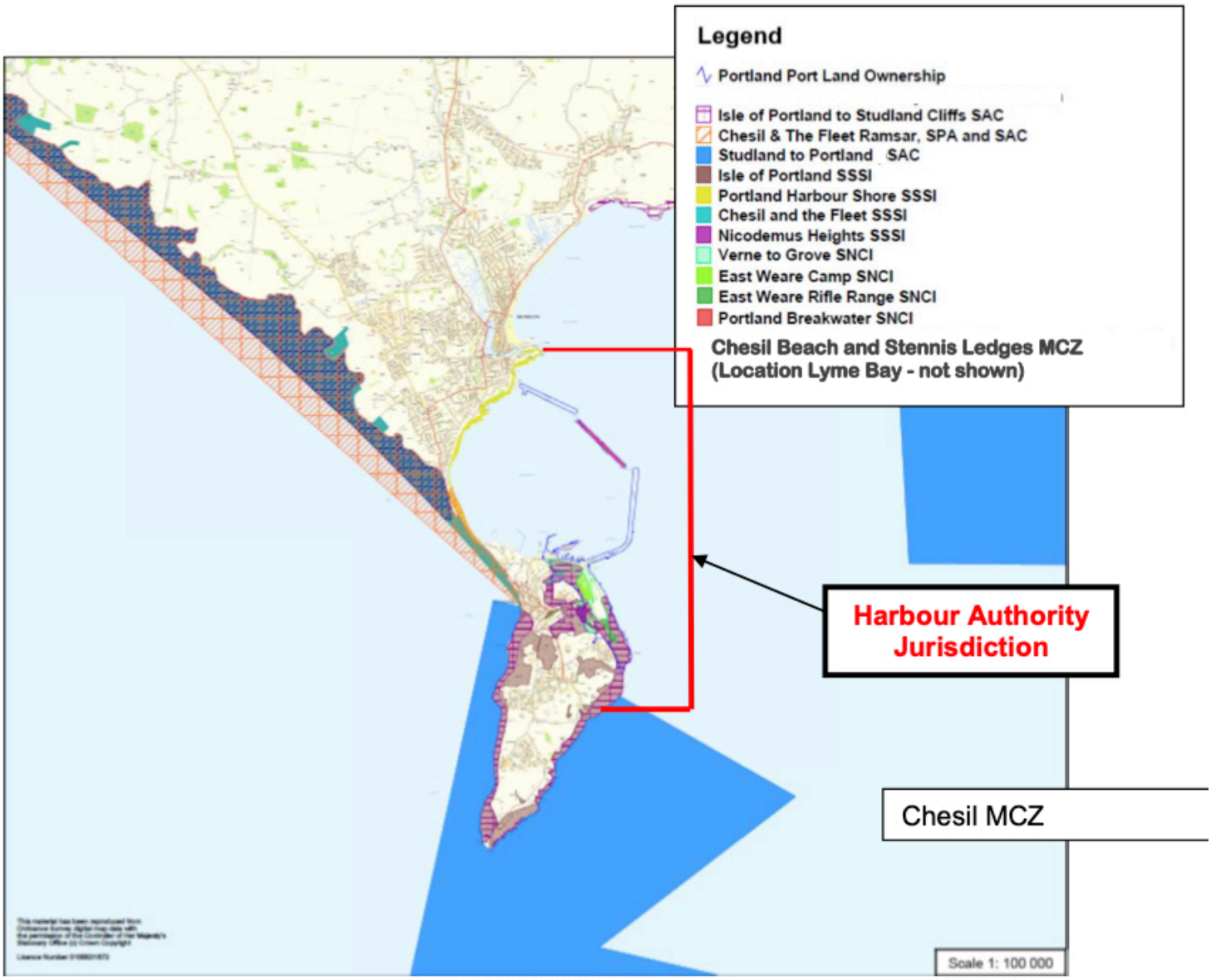
A major government-funded research study published today suggests particles released from vehicle tyres could be a significant and previously largely unrecorded source of microplastics in the marine environment.

The study is one of the first worldwide to identify tyre particles as a major and additional source of microplastics. Scientists have previously discovered microplastics, originating from microbeads in cosmetics and the degradation of larger items such as carrier bags and plastic bottles, in marine environments globally - from the deep seas to the Arctic.

What does seagrass have to do with climate change?

Seagrasses don't receive much attention, but they are one of the most productive ecosystem types on the Earth. They also have an incredible ability that helps fight climate change – a huge capacity for carbon absorption. Seagrasses act as a dense sediment trap, capturing carbon and storing it, eventually depositing it onto the seafloor.

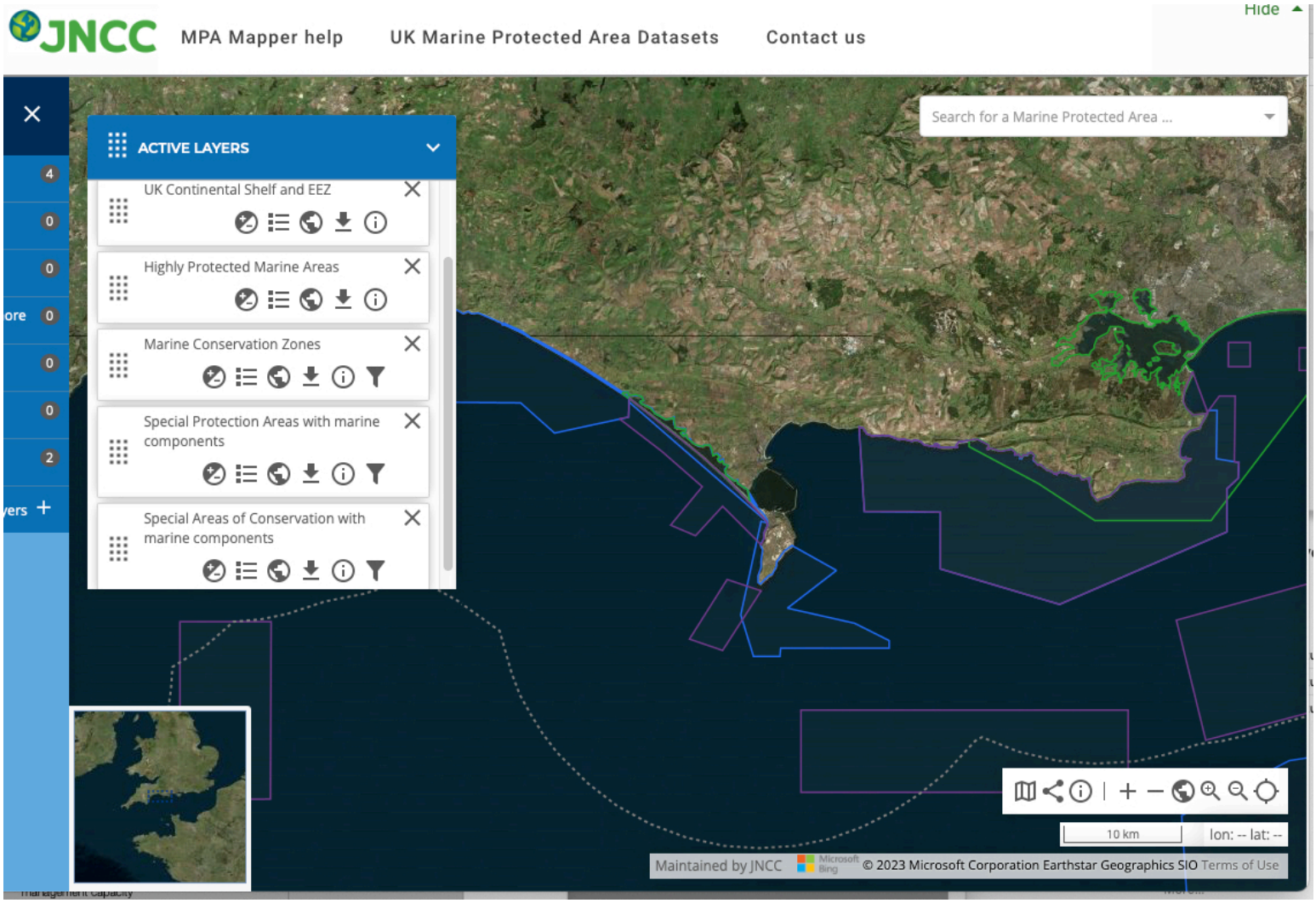
Figure 1 - Designated Nature Conservation Sites



2. **The priority areas for action on climate change adaptation are covered**

In a previous blog on how to measure success on adaptation in the natural environment, I outlined the four areas that the ASC has said need to be improved in order to give us the best chance of adapting to climate change. These four areas are: resilience of habitats and biodiversity; soil health; flood hazard protection; and the marine environment and fisheries. Each area is covered in some detail in the Plan. It contains announcements for new strategies on nature, peatlands, fisheries, and of course the next National Adaptation Programme. And there are a range of relevant actions included, such as accelerated woodland planting (including the creation of the new Northern Forest), developing a 500,000 hectare nature recovery network, and investing £200,000 to identify better ways to monitor soil health, including soil carbon. These measures are important for both climate change mitigation and adaptation.

The Plan also includes ambitions for using the natural environment to improve societal health. The strengthening of an "environmental gain principle" for new development, if implemented well, could incentivise much greater uptake of green infrastructure including sustainable urban drainage (SuDS), green space, green roofs and walls. These are measures that help to reduce the risk to people from flooding and overheating, and also have a host of co-benefits, for example in increasing urban habitat space for biodiversity, and improving air quality. The Plan includes actions to amend Planning Practice Guidance to clarify construction and maintenance arrangements for sustainable urban drainage, which the ASC and many other organisations have called for. There is also an action to look at strengthening the National Planning Policy Framework to ensure new developments are flood resilient.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UK Continental Shelf and EEZ
Highly Protected Marine Areas
Marine Conservation Zones
Special Protection Areas with marine components
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