



Department  
for Environment  
Food & Rural Affairs

# Marine Strategy Part One: UK Updated Assessment and Good Environmental Status **Summary of responses**

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## Contents

Introduction .....	4
Overview of responses .....	4
Summary of responses on general issues .....	5
Summary of responses on the proposals for Descriptors 1 & 4: Cetaceans .....	10
Summary of responses on the proposals for Descriptors 1 & 4: Seals .....	14
Summary of responses on the proposals for Descriptors 1 & 4: Birds .....	19
Summary of responses on the proposals for Descriptors 1 & 4: Fish .....	25
Summary of responses on the proposals for Descriptors 1 & 4: Pelagic habitats .....	25
Summary of responses on the proposals for Descriptors 1 & 6: Benthic habitats.....	26
Summary of responses on the proposals for Descriptor 2: Non-indigenous species (NIS)	31
Summary of responses on the proposals for Descriptor 3: Commercial Fish .....	33
Summary of responses on the proposals for Descriptor 4: Food webs.....	38
Summary of responses on the proposals for Descriptor 5: Eutrophication .....	40
Summary of responses on the proposals for Descriptor 7: Hydrographical conditions .....	41
Summary of responses on the proposals for Descriptor 8: Contaminants .....	44
Summary of responses on the proposals for Descriptor 9: Contaminants in seafood.....	48
Summary of responses on the proposals for Descriptor 10: Marine litter .....	50
Summary of responses on the proposals for Descriptor 11: Underwater noise .....	53
Annex A: list of consultation questions .....	58
Annex B: respondents and comment summaries .....	58

# Introduction

1. This document contains the UK government response to the consultation: Marine Strategy Part One: UK Updated Assessment and Good Environmental Status, which was held between 9 May and 20 June 2019.
2. The UK Marine Strategy outlines how we plan to achieve Good Environmental Status, which is defined as 'ecologically diverse and dynamic ocean and seas which are clean, healthy and productive', by 2020. This is a requirement of the Marine Strategy Regulations 2010, which is derived from the Marine Strategy Framework Directive. Achieving GES involves protecting the marine environment, preventing its deterioration and restoring it where practical and/or necessary, whilst at the same time providing for sustainable use of marine resources. GES does not require the achievement of a pristine environmental state across the whole of the UK's seas.
3. The consultation marked the beginning of the second implementation cycle of the UK Marine Strategy Parts 1-3 (the Strategy) and included: information about the features, characterisation of, and pressures facing our seas; an explanation of the UK's current approach to implementing the Strategy; the updated progress relating to the UK's GES targets; how progress towards the achievement of GES is measured; new objectives for GES and targets; and a separate Annex detailing threshold values or reference levels for the various indicators which the UK plans to use for the 2018-2024 cycle of the Strategy to assess whether the associated targets will be met.
4. A total of 47 responses to the consultation were received from a range of sectors including environmental Non-Governmental Organisations (NGOs), marine industries, the energy industry, the marine research community and members of the public. Annex B contains a list of respondents and a breakdown of the number of comments contained within those responses referring to each Descriptor.
5. The UK government and Devolved Administrations would like to thank everyone who contributed to our consultation.

## Overview of responses

The aim of this document is to provide a broad summary of stakeholder responses and responds to the main issues raised. The summaries of consultation responses that follow

highlight the main issues raised, but are not an exhaustive commentary on every response received. However, all responses were considered when making final decisions.

Many comments touched on multiple Descriptors. For example, comments relating to marine mammal populations may have covered issues including underwater noise and marine litter. Where this was the case, the comments have either been broken down into their component points or have been addressed under the key Descriptor flagged for policy decisions.

Generally, responses were supportive of the assessments of the state of the UK Seas, but it was noted that more needed to be done to achieve GES. Some respondents suggested that we could improve our trajectory towards achieving GES by putting in place more ambitious and explicit targets focused on the recovery of marine ecosystems and called for greater monitoring and research efforts in order to address knowledge gaps and uncertainties regarding the assessment of GES. Many respondents believed that championing a well-managed network of Marine Protected Areas (MPAs) was key to protecting our most vulnerable species. There was some uncertainty over the role of the UK Marine Strategy in tackling climate change, and how the impacts of different types of fishing on certain marine species were categorised in the assessments. We agree with these comments and have addressed these concerns in the updated document: we have set more ambitious operational targets; will be looking to put in place more effective monitoring programmes and to undertake research to address knowledge gaps and uncertainties; and are working hard to put in place a well-managed network of Marine Protected Areas (MPAs).

## Summary of responses on general issues

A number of respondents commented on issues that relate to more than one Descriptor, or that have a more overarching nature. We have provided a response to the main general issues below.

## Issue raised: historic environment<sup>1</sup>

**We received a number of comments from stakeholders wishing to see the economic and social value of the historic environment better reflected throughout the UK Marine Strategy. They recommended the addition of a new GES Descriptor covering the historic environment, the incorporation and express reference to the historic environment - wherever relevant - in existing GES Descriptors, and greater emphasis on the importance of our underwater cultural heritage and the historic environment in section 2 of the Marine Strategy.**

Conserving our marine historic environment and cultural heritage are aims that we support. Plans are in place to consider whether social and cultural indicators and targets could be developed and this will include marine cultural heritage and the historic environment. Our marine heritage is of great value to the UK society, communities, and the economy. In light of this, we have expanded section 2.5 of the UK Marine Strategy to make greater reference to the historic environment.

## Issue raised: citizen science

**Generally, respondents supported the use of citizen science and advocated taking advantage of the resource to achieve GES. Many felt that citizen science could be valuable in providing evidence to address knowledge gaps and improve monitoring efforts. A small number of respondents raised concerns with the quality of data generated by citizen science and a number of respondents also recommended that adequate training and guidance to facilitate quality data collection should be made available. One respondent suggested a "knowledge hub" online where requests for data can be outlined, and bids or offers to gather data against agreed metadata standards can be placed by a wide range of actors include marine research laboratories, universities, industry, NGOs and citizen scientists.**

Descriptor 1 & 4: Birds makes particular use of citizen science. Within OSPAR, the UK gathers a high quantity of its bird indicator data through citizen science programmes, such as the British Trust of Ornithology-led monitoring programmes, which government bodies play a key role in funding and co-ordinating. Citizen science is also playing an increasing role in building the evidence base for Marine Protected Area designations. We are keen,

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<sup>1</sup> In this instance, we refer to the marine historic environment defined in the UK Marine Policy Statement defined as: "all aspects of the environment resulting from the interaction between people and places through time, including all surviving physical remains of past human activity, whether visible, buried or submerged".

however, to make the better use of citizen science observations across other Descriptors, especially in support of marine mammal observations. We are aware of the limitations of citizen science. For example, the citizen science that is currently available in relation to microplastics provides strong indicative data, but does not meet our quantitative needs at this time for use in detailed assessments. However, we recognise the potential for engaging the public in working towards GES and harnessing the data they generate. As such, we will consider how best to develop new tools to make best use of the citizen science resource.

## Issue raised: climate change

**Issues relating to climate change featured in many respondents' comments. Many respondents wished to see climate change linked indicators incorporated into Descriptors and a greater ambition to comprehend and take into account the ways in which climate change may affect GES.**

Climate change is a known threat to marine habitats and wildlife. The UK is committed to an international effort to investigate and tackle climate change impacts in the marine environment. The UK also contributes to the work of the OSPAR Convention to monitor and assess the nature, rate and extent of climate change and ocean acidification on the marine environment. Furthermore, the UK is committed to ensuring the integrated management of human activities in order to reduce impacts on the marine environment, to considering appropriate ways of responding to observed climate shifts in the marine environment.

Climate change is an important force to consider and is primarily referred to in Section 2.7 of the UK Marine Strategy. In addition to this, human activities that contribute to climate change are making changes to the marine climate and the associated hydrographical conditions. These are also considered, ensuring that climate changes are built into understanding the drivers of change in all the indicators across Descriptors.

Further to this, a range of steps are being taken within the scope of the UK Marine Strategy to ensure that climate change is taken into account while we work towards achieving GES. For example, management tools are being developed for Marine Protected areas that will take into account the array of pressures that threaten designated species, including climate change and include consideration of how conservation of sea grasses and salt marshes can help sequester carbon. To safeguard the long-term health of fish stocks, Scotland have established a Climate Change and Ocean Acidification work-stream.

## Issue raised: data resources

**Several respondents claimed that there was a substantial quantity of data lacking, which was threatening to compromise the successful and effective establishment of target objectives.**

In order to make our sources of data transparent, a Marine Online Assessment Tool (MOAT) has been launched to support this consultation. The MOAT details the wide range of data that has contributed to this assessment. Assessments are carried out (for Descriptors 1, 4 & 6) for the main ecosystem component groups and food webs, with sensitive species indicator assessments covering demersal fish, birds, seals and cetaceans and habitat assessments for benthic and pelagic habitats. An underwater noise assessment (Descriptor 11) has been carried out with specific details available on the MOAT. Where there are knowledge gaps we hope to fill these through the updated monitoring programmes, including the use of new technologies and citizen science, which will be set out in the updated UK Marine Strategy Part 2 in 2020.

## Issue raised: governance of devolved countries

**One respondent commented on a perceived lack of adequate governance and queried the consistency of fisheries management in particular across the devolved UK countries.**

We do not agree with the specific reference to lack of adequate governance within Scottish waters, and would like to point out that fisheries enforcement is devolved within the UK. All constituent parts have to abide by EU/UK law, and in Scotland, by Scottish legislation. Fines and penalties act as a significant deterrent to non-compliance. Scotland is also in the process of rolling out vessel tracking for the under 12m fleet which will address some of the data issues for this sector going forwards.

## Issue raised: Marine Protected Areas (MPAs)

**NGOs recommended that MPAs across the UK should have robust management measures in place that are implemented and enforced by the end of 2020. They requested that management be clearly defined in the context of recovery of the MPA network as a whole. NGOs asked for areas of importance for carbon storage and sequestration, e.g. sea grass beds, be mapped by 2021 and incorporated into future MPA management and designation.**

We agree that Marine Protected Areas (MPAs) need to be managed effectively to ensure our marine environment is healthy and resilient. The UK MPA network has progressed substantially over the last six years. We currently have 355 MPAs protecting 25% of UK



waters compared to 217 sites covering 8% of UK waters in 2012. The UK's network of MPAs will play a significant role in supporting the achievement of GES for a number of descriptors, in particular descriptor 1 on biodiversity and descriptor 6 on seafloor integrity.

We have made progress in applying management measures within MPAs. For example in England, 94 inshore MPAs have management measures in place to protect sensitive features from methods of bottom towed fishing gears, and a review of Highly Protected Marine Areas (HPMAs), is underway.

Government recognises the crucial role of nature-based solutions for climate mitigation and adaptation, such as the protection and restoration of coastal habitats, including seagrass and saltmarsh. Whilst the primary purpose of MPAs is to protect biodiversity, protecting coastal and marine habitats provides a number of climate related co-benefits for mitigation and adaptation, including improved ocean resilience to the accelerating impacts of climate change, providing coastal protection from erosion and storm surge, and the protection and where necessary restoration of blue carbon habitats and nursery grounds for species of commercial interest and marine conservation importance. We continue to work on developing methods to assess impacts of climate change on MPAs.

We have updated the MPA chapter in the updated Marine Strategy Part One to reflect these views.

## **Issue raised: heavy industry and socio-economic assessment**

**Energy UK noted the significant increase in productivity that the renewable energy sector has seen in recent years, despite the reported decrease in GVA (Gross Value Added). Therefore, with the support and input from the Seabed and User Developer Group (SUDG), Energy UK has completed its own assessment of the socio-economic benefits of the marine industry.**

We have included a reference to this report in section 2.5, "Uses of the marine environment", of the updated Marine Strategy Part One.

## **Issue raised: reporting scales**

**One respondent requested clarification on the temporal and spatial scales of assessment.**

Status and trends assessments were conducted for the UK portion of the Greater North Sea and Celtic Seas (which constitute the Marine Strategy Framework Directive sub-regions), and at the smaller scale of the 8 UK biogeographic marine regions set out in

Charting Progress 2. The exact methods and stations used for temporal and spatial scales can be found in the Marine Online Assessment Tool for each indicator assessment<sup>2</sup>.

## Summary of responses on the proposals for Descriptors 1 & 4: Cetaceans

### Issue raised: structure and aim of cetacean targets

**A number of respondents put forward that GES targets should aim to stimulate improvement of the species and its associated habitats, as opposed to simply avoid or minimise decline. Further to this, it was stated that the targets in question must be SMART.**

There are pressures potentially threatening cetaceans in UK waters (e.g. bycatch). However, given the current lack of conclusive evidence to support a need to restore or increase populations of certain cetacean species, our aim is to prevent significant decline from current levels in all species. The 2018-2024 assessments provide an opportunity to make operational targets 'SMART' (Specific, Measurable, Attainable, Relevant, Time-bound) where possible. We aim to develop targets for pressures over which we can have direct management control with actions that will have clear timescales of achievement, to prevent decline in abundance. However, targets for natural states (biomass, abundance, distribution etc.) should be considered aspirational and not time-bound, given the range of influences acting on them, some of which are not in our control.

We acknowledge that declines are difficult to determine without long term datasets from regular surveys to enable analysis of trends (see below in Cetacean Population Monitoring or the "Going forward" section of the updated UK Marine Strategy). As such, we need to manage pressures to ensure no decline. Non-UK influences notwithstanding, by implementing targets that work to mitigate pressures, we should significantly reduce the threat on cetaceans in UK waters (see the "Going forward" section of the updated UK Marine Strategy for how this will be monitored).

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<sup>2</sup> <https://moat.cefas.co.uk/>

## Issue raised: cetacean bycatch

**Many respondents stated that a UK cetacean bycatch strategy should be developed by 2020. In addition, the respondents proposed that the target should be set to zero cetacean bycatch and include an indicator of common dolphin bycatch.**

Defra is leading development of a UK Cetacean Bycatch Mitigation Initiative driven by the need to identify sources of risk to the sustainability of cetacean populations, involving stakeholders to recommend effective ways forward to reduce cetacean bycatch. Risk from bycatch is currently monitored through the UK Bycatch Monitoring Programme and UK Cetacean Strandings Investigation Programme.

The assessments carried out ahead of this consultation were made using ASCOBANS (Agreement on the Conservation of Small Cetaceans of the Baltic and North Seas) thresholds: total anthropogenic removal to be less than 1.7 % of the best available abundance estimate, with 1 % for bycatch, ultimately aiming for zero percent cetacean bycatch.

For the North Sea assessment, bycatch was recorded at less than <1% and therefore lies within the boundaries of the threshold. Celtic Sea is less certain and likely above 1%, as stated in the consultation document. The ambition to drive bycatch towards zero is reflected in the consultation document "and to achieve this, bycatch should ideally be less than 1% of the best available abundance estimate and ultimately, be reduced to zero (ASCOBANS resolution No. 5, 2006)". It should be noted that attempting to implement a target of zero bycatch is not achievable as mitigation is rarely 100% effective without entirely removing the pressure. However, working to reduce bycatch as much as possible will drive improved monitoring and the best mitigation available.

## Issue raised: cumulative impacts on cetaceans

**Several respondents suggested that we introduce a cumulative impacts assessment and target. As part of this, they said that cumulative impacts should be incorporated as a future action and linked with work undertaken by OSPAR and in the UK, potentially through The Crown Estate's future Strategic Enabling Works as identified in the Offshore Wind Farm Sector Deal.**

The ASCOBANS 1.7% anthropogenic removal threshold is vital as a threshold for impact of cumulative pressures. Measuring is most straight forward when related to mortality and is monitored through, for example, the UK Cetacean Strandings Investigation Programme and may also be reflected in abundance trends. Indirect impacts, such as noise resulting in disturbance or impairment, are more challenging to measure. Though there are ongoing attempts to quantify the indirect impacts and models that combine direct and indirect to compare the contributions to impact, there are issues with all approaches, particularly

parameterising models. The methodology for cumulative effects assessments needs further development before it can be used for target setting.

In spite of the challenges, we recognise the need to act on cumulative impacts. Work is underway within OSPAR to develop a cumulative impacts indicator and to research the impacts of marine tourism and Acoustic Deterrent Devices (ADDs). A UK Dolphin and Porpoise Conservation Strategy is being developed, which includes identification of risk from pressures and an action plan to address the risk, resulting in, for example, development of the UK Cetacean Bycatch Mitigation Initiative.

## **Issue raised: Acoustic Deterrent Device (ADD) regulation**

**NGOs recommended that we introduce a robustly enforced licensing scheme for ADDs leading to an eventual phase out of use to protect marine mammals including seals.**

We acknowledge that there are concerns regarding the use of ADDs at fish farms and the potential for unintended consequences on cetaceans. Marine Scotland has recently commissioned research which will improve understanding on the use, efficacy and impact of ADD use within the aquaculture industry which will report in summer 2020. Furthermore, a review of the current regulation of ADDs is ongoing to determine if changes to the current processes are required.

## **Issue raised: cetacean population distribution**

**A number of respondents questioned whether the change of wording in the population distribution target would represent a weakening of the target. The wording has changed from ‘At the scale of the MSFD sub-regions the distribution of cetaceans is not contracting as a result of human activities: in all of the indicators monitored there is no statistically significant contraction in the distribution of marine mammals caused by human activities’ to ‘Population ranges are not significantly lower than favourable reference values for the species.’**

We believe the change in wording will not result in any weakening of the target. The change was made to align with the requirements of Commission Decision 2017/848, but both versions of the target involve testing against the same baseline.

## **Issue raised: cetacean population monitoring**

**Concerns were raised that current monitoring is insufficient, that a target for monitoring cetacean populations should be introduced, and that Small Cetaceans in the European Atlantic and North Sea (SCANS) monitoring should be supplemented with hydrophone data and surveying at other times of year.**

We acknowledge that current monitoring is insufficient to assess the outcome of the cetacean target accurately. Infrequency of SCANS surveys has been noted with a commitment to consider increasing frequency and making better use of citizen science observations. JNCC is leading a new project to make better use of other sources of cetacean monitoring data including industry and NGO sources, in order to enable analyses at relevant spatial and temporal scales. To support this ambition, the Collaborative Oceanography and Monitoring for Protected Areas and Species (COMPASS) project will continue to gather acoustic data and the Healthy and Biologically Diverse Seas Evidence Group will further develop the integrated monitoring of cetaceans in the UK.

In terms of additional data, there is growing use of drone footage to assess health of live animals and nutritional status data are routinely collected through post-mortem examination under the UK Cetacean Strandings Investigation Programme. There are ongoing discussions regarding licensing for landing bycaught cetaceans for scientific analysis, which would remove some of the bias existing with stranded animal data, and on how to enable more comprehensive diet monitoring from stranding samples. We will continue to investigate methods to improve our understanding of cetacean population status going forward.

## **Changes to Descriptor 1 & 4: Cetaceans in the updated Marine Strategy Part One resulting from the consultation**

In view of the comments received and our responses detailed above, the following actions will be carried out. We will take forward the development of a UK Cetacean Bycatch Mitigation Initiative to identify sources of risk to cetacean welfare. A UK Dolphin and Porpoise Conservation Strategy is being developed to identify risks from pressures acting on these cetaceans and create action plans to address those risks. We will work in OSPAR to develop cumulative impacts indicators for cetaceans. This includes researching the impacts of tourism and Acoustic Deterrent Devices (ADDs). A licensing review of ADDs is ongoing with recommendations for improved regulation expected in 2020. We will change the “Going forward” section in the updated UK Marine Strategy as follows.

“Going forward” section in the consultation document	Revised “Going forward” section
<p>We will aim to determine trends in abundance of cetacean species and the impact of human pressures, such as bycatch and noise disturbance, at a North-East Atlantic scale to better assess progress against the UK targets.</p> <p>We will consider increasing the frequency of our SCANS surveys to improve our confidence in our abundance assessments for more species and make better use of citizen science observations.</p> <p>We will develop a UK cetacean bycatch strategy.</p>	<p>We will aim to determine trends in abundance of cetacean species and the impact of human pressures, such as bycatch and noise disturbance, at a North-East Atlantic scale to better assess progress against the UK targets.</p> <p>We will consider increasing the frequency of our SCANS surveys to improve our confidence in our abundance assessments for more species and make better use of citizen science observations.</p> <p>We are developing the UK Bycatch Mitigation Initiative (BMI) as part of our commitment to deliver the UK Dolphin &amp; Porpoise Strategy.</p>

## Summary of responses on the proposals for Descriptors 1 & 4: Seals

### Issue raised: regional scale of marine mammal assessments

**One respondent queried the spatial scale at which marine mammal assessments were carried out, in particular why seals in Northern Irish waters were not assessed along with those from the Republic of Ireland waters rather than the rest of the UK.**

The UK Marine Strategy has been developed based on the Regional Seas Approach. Recognising that ecosystem components often cross national boundaries. Northern Ireland's marine waters are contained within the Celtic Seas sub-region of the NE Atlantic. The Celtic Seas sub-region groups marine waters of similar characteristics and includes sea areas from Northern Ireland, Ireland, Scotland, England, Wales and France.

Marine mammals are highly mobile species, therefore, monitoring and management need to occur at a relevant spatial scale. Marine mammal populations are managed at a variety of scales, including regionally; with area based management such as Marine Protected

Areas and also at population level which may be at Management Unit scale, which is developed based on evidence of demographically independent populations of a species.

## Issue raised: seal habitat management

**Some respondents felt that preservation and management of seal habitat was not sufficiently addressed.**

Special Areas of Conservation in UK waters have conservation objectives, which apply to the site and the individual species and/or assemblage of species for which the site has been classified. Habitat of qualifying species is a consideration within these conservation objectives which, along with other guidance including advice on operations, help inform management of activities in these designated areas. Presently within the UK, there are 13 Special Areas of Conservation (SACs) that list grey seals as an interest feature, and 12 SACs listing harbour (common) seals. Within SACs, competent authorities have to take appropriate steps to avoid significant disturbance to the species concerned.

The Marine Scotland (2010) Act allowed for the designation of five Seal Conservation Areas in Scottish waters and also provides for additional protection for seals at designated haul-outs. There is guidance available on the offence of harassment at these designated seal haul-out sites. The UK and devolved administrations have responsibility for the conservation and management of seal populations in their waters on the basis of independent scientific advice provided by the Natural Environment Research Council's Special Committee on Seals (SCOS). Seal surveys are conducted by the Sea Mammal Research Unit to inform this advice. Elsewhere in the UK, a number of safeguards for seal habitat are being considered. For example, a wildlife watching code to help minimise human disturbance of seals and adding seals as protected feature of existing Sites of Special Scientific Interest (SSSIs) are being considered.

Wildlife watching codes of best practice, operator advice and accreditation schemes are already in place in many parts of the UK. For example, the Partnership for Action against Wildlife Crime Northern Ireland and WiSe Scheme accreditation are initiatives already in operation.

## Issue raised: seal interactions with fisheries

**Respondents raised concerns regarding seal and fish stock population interactions. They highlighted the need to better comprehend seal inter-species competition, and predation impacts on sustainable fisheries and the wider food web.**

Most recent estimates of seal populations in the UK (to the nearest 100 individuals) are 150,000 for grey seal and 32,600 for harbour seal (SCOS, 2018). For the larger grey seal



population, patterns of increase across the UK are not stable and show wide fluctuations, with trends at some haul out levelling out indicating carrying capacity has been reached (for example in North West Scotland) (SCOS, 2018). Potential causes and drivers of the harbour seal decline along the east and north coast of Scotland is being investigated by the Sea Mammal Research Unit at the University of St Andrews, including inter-species competition, pollution and contaminants amongst others.

The UK Bycatch Monitoring Programme collects data and regularly reports on the bycatch of all protected species including seals. The programme puts observers onto commercial fishing vessels. These observers could potentially be used to collect information on the levels of seal depredation of fish in nets, which could help take note of the numbers of seals that depredate fish, but avoid being bycaught.

Research has shown that predation by seals is not one of the major factors effecting fish stocks and that commercial fisheries and predation by other fish are more important. However, the food web indicator looks to measure targets in this area. Fish communities are a key component of the food webs indicator, with some communities showing evidence of recovery. Future targets and criteria under consideration may include trophic guild diversity, balance between trophic guilds, size distribution within guilds/communities and productivity of key fish species (such as sandeels). As part of the food web indicator investigations, predator-prey interactions between plankton, fish, seabirds and marine mammals will be explored to identify foraging areas supporting top-predators, and assess changes in interactions.

## **Issue raised: seal bycatch prevention**

**A number of respondents wish to see a legally underpinned bycatch strategy by the end of 2020 with some suggesting a target of zero seal bycatch.**

Research investigating the cause of harbour seal decline along the Scottish east and north coast has ruled out bycatch as a potential cause of the decline. Nevertheless, a bycatch indicator and target for seals will be developed to ensure the long-term viability of seal populations is not threatened by incidental bycatch across the UK. We are also looking into incorporating data collection on seals as part of the Cetaceans Strandings Investigation Programme, which will help us to better understand and mitigate this issue.

Fisheries often have multiple species bycatch therefore single species solutions may not be appropriate and may even exacerbate the issue for other species, so a coordinated approach is required. Mitigation is also rarely 100% effective unless pressures are completely removed. Unfortunately, a true zero is not achievable, but having a realistic threshold with zero as the 'ultimate' goal (like ASCOBANS cetaceans) and putting in place adequate monitoring and best mitigation to reduce bycatch below the threshold, and as close to zero as possible, is the preferred way forward.



## Issue raised: seal population status and monitoring

**Numerous respondents raised concerns about the assessment of GES for seals and harbour seal population declines. Comprehensive monitoring was put forward as a mechanism to effectively assess seal populations and manage activities that impact upon them. Respondents recommended utilising nutritional analysis of blubber samples from strandings, telemetry and bycatch.**

We concluded that GES had been partially achieved for seals because the status of grey seals was consistent with GES, but the status of harbour seals in the Celtic Seas was uncertain and was not consistent with GES in the Greater North Sea. Abundance and productivity of grey seals have both increased significantly since the UK initial assessment (HM Government, 2012) and also over the longer-term, since the early 1990s. Both UK targets for grey seal abundance and pup productivity were met. In the Greater North Sea, abundance of harbour seals is stable or increasing along the east coast of England, but significant declines have been observed on the Scottish east coast. Celtic Sea harbour seal numbers have decreased in the Western Isles, but increased on the west coast of Scotland. Combining these conclusions for harbour seal with the achievement of GES for grey seal has led us to the overall conclusion for seals was therefore assessed as partially met.

The Harbour Seal Decline Project, conducted by the Sea Mammal Research Unit at the University of St. Andrews, is an ongoing investigation into the potential causes of declining harbour seal numbers along the east and north coast of Scotland (<https://synergy.st-andrews.ac.uk/harbourseals/>). The project, funded by the Scottish Government, investigates potential drivers including bycatch, prey quality and availability, competition with marine species, and the legal control to name but a few. Regular surveys of UK seal haul out sites will continue to be conducted to monitor population and trends, and regions of decline and uncertainty will be surveyed more frequently to establish population trends and abundance. The Scottish Marine Animal Stranding Scheme (SMASS) routinely collect data on dead stranded seals around the coast of Scotland, including cause of death. These data is used by various government bodies and research institutes across the UK, including to inform investigations and research conducted by the harbour seal decline project. Depending on availability and condition of stranded animals, this could expanded into England and Wales by including seals in the established UK Cetaceans Strandings and Investigation Programme (CSIP). There are biases with the use of stranding data; stranded individuals may not be typical examples of seal health. Nevertheless such data are no doubt valuable given the current lack of a non-lethal alternative direct measures of nutritional condition in wild seals. Whilst post-mortems are not systematically carried out on all stranded seals in Northern Ireland DAERA do currently log and record details of all dead seals.

Seal abundance surveys are not designed to detect changes in distribution, and they reflect the (on-land) distribution of seals only at specific times of the year. Change in

distribution is therefore used as a ‘surveillance indicator’ to help interpret changes in abundance, and it is monitoring these changes that provide crucial information on the status of the species around the UK coast. Incorporating telemetry data would allow for better understanding of both on-land and at-sea distribution of seals.

## Changes to Descriptor 1 & 4: Seals in the updated Marine Strategy Part One resulting from the consultation

In view of the comments received and our responses detailed above, we will change the “Operational targets” and “Going forward” section in the updated UK marine Strategy as follows.

<b>Operational target in consultation document</b>	<b>Revised operational targets</b>
<p>We will conduct research to:</p> <p>a) investigate potential causes of the harbour seal declines in Scotland, focusing on interactions with grey seals (competition and predation) and on exposure to toxins from harmful algae.</p> <p>b) investigate the life history parameters (e.g. survival and birth rates) and population dynamics of seals to improve our understanding of what is happening within these populations.</p>	<p>We will conduct research to:</p> <p>a) investigate potential causes of the harbour seal declines in Scotland, focusing on interactions with grey seals (competition and predation) and on exposure to toxins from harmful algae.</p> <p>b) investigate the life history parameters (e.g. survival and birth rates) and population dynamics of seals to improve our understanding of what is happening within these populations.</p> <p>We will continue investigations into seal-fishery interactions, such as seal depredation of commercial fish and seal bycatch and entanglement, underpinned by improved monitoring where possible.</p>

“Going forward” section in the consultation document	Revised “Going forward” Section
<p>Determining the impact of human pressure is key to assessing progress against the UK target. Regular surveys will continue around the UK coast to monitor population abundance and trends. In addition, regions of decline will continue to be surveyed more frequently to establish population trends and abundance. A seals bycatch indicator will be developed.</p>	<p>Determining the impact of human pressure is key to assessing progress against the UK target. Regular surveys will continue around the UK coast to monitor population abundance and trends. In addition, regions of decline will continue to be surveyed more frequently to establish population trends and abundance.</p> <p>A seals bycatch indicator and target will be developed in collaboration with OSPAR to ensure that the long-term viability of seal populations is not threatened by incidental bycatch.</p>

## Summary of responses on the proposals for Descriptors 1 & 4: Birds

As noted under ‘Descriptors 1 & 4: Cetaceans’, a need to create a SMART target that stimulated the improvement of seabird populations and their associated habitats and resources, as opposed to preventing decline from 2012 levels, was also raised for birds. Our response for this target for birds is in line with that given for ‘Descriptors 1 & 4: Cetaceans’.

### Issue raised: marine bird bycatch

**NGOs called for a seabird bycatch action plan to be developed by 2020 and implemented without delay, setting the bycatch threshold to 1% of natural annual mortality and ensuring that targets are coherent and SMART.**

Defra, together with JNCC, are developing the transposition of the FAO Plan of Action on Seabird Bycatch into a National UK Plan of Action (PoA), which regulatory bodies will be able to adopt. As part of this process, we are working with a wide group of stakeholders including environmental groups and the fishing industry.

To represent this work in the Marine Strategy, the updated Part One will incorporate the following proposed operational target: ‘Delivering the UK Plan of Action on Seabird

Bycatch; by improving our understanding of bycatch risk, the publication of a UK National Plan of Action and the development of bycatch mitigation tools.'

We aim for the UK PoA to be published by 2021. JNCC will also develop a mitigation tool box, which will assist the government, regulatory bodies, the fishing industry and individual fishers in decision making with regards to appropriate mitigation, specific to gear type and other factors.

In order to assess the scale of seabird bycatch in UK waters, two government-commissioned studies on seabird mortality from bycatch and the possible associated population impacts will be published by early 2020. Furthermore, part of the PoA will detail collecting seabird bycatch data more systematically and plans for regional projects that will increase monitoring and trialling mitigation measures for seabird bycatch beginning in 2020.

The current target for bycatch mortality in the Marine Strategy is that "the long-term viability of marine bird populations is not threatened by deaths caused by incidental bycatch in mobile and static fishing gear" and this will be further discussed with stakeholders, including the fishing industry during the development of the UK PoA.

We find the suggested '1% natural annual mortality' as a threshold for bycatch mortality a useful and pragmatic approximation to a limit of zero bycatch. It acknowledges that with the best mitigation measures in place, birds will still be caught accidentally. However, a seabird bycatch threshold should also be in line with international standards in order to facilitate international coordination and research.

## **Issue raised: marine bird breeding success thresholds**

**Some respondents asserted that the threshold 'widespread lack of breeding success in marine birds caused by human activities should occur no more than three years in six' is insufficient to prevent population decline.**

This issue refers to a current target which is assessed using the OSPAR indicator on Marine bird breeding success or failure which was developed by JNCC and British Trust of Ornithology in the UK. We acknowledge the indicator's limitations and these have also been highlighted in reports by the OSPAR /ICES/HELCOM JWGBIRD. Nevertheless, both HBDSEG and OSPAR consider the indicator is useful in highlighting those species that are experiencing severe breeding problems.

A new method for assessing trends in breeding success is being developed within JWGBIRD and changes to the existing target setting approach will be proposed to OSPAR in 2020.

We would like to highlight that, while the threshold for measuring GES is that widespread lack of breeding success occurs no more than three years in six, our overall target is still

that the abundance of seabirds is not significantly affected by human activities. We will therefore continue to minimise the impacts of human activities as far as possible, even if this target is achieved.

## **Issue raised: marine bird abundance targets**

**Some respondents questioned whether the target of ‘changes in abundance of marine birds should be within individual target levels in 75% of species’ is insufficient. They suggested that the target level should be changed to 90%.**

Species specific thresholds for declines in abundance of 20% and 30% are in line with the UK Birds of Conservation Concern criteria of 25% long-term decline to identify species of concern. However, the particular thresholds used in the assessment were developed by OSPAR for the Intermediate Assessment 2017. The thresholds originally intended to be compared against an objective baseline (i.e. at a population size indicating a healthy population with negligible human impacts), rather than any given point in time. We share the ambition to set more objective baselines and address our knowledge gaps. But the procedure from collecting data to setting more objective baselines and gaining consensus on these baselines in OSPAR is a complex process.

Confidence in using 90% would be higher if more evidence was available to link changes in distribution and population size of every species in the indicators to anthropogenic activities, providing a high level of confidence that the implementation of certain measures would reverse unfavourable change and restore or maintain GES. Without stronger links between state, pressure and response, we are not yet ready to amend the target percentage.

## **Issue raised: Special Protection Area (SPA) connectivity and management**

**Respondents called for a greater commitment towards creating a complete network of UK SPAs with management plans and conservation objectives for all protected areas to support bird populations.**

The UK is committed to completing an ecologically coherent and well-managed network of Special Protection Areas (SPAs), supporting a wider network of MPAs across the North Atlantic and honouring our legal obligation under the Birds Directive. In light of this and changes to operational targets for Marine Protected Areas in general, the following amended operational target will be included in the updated UK Marine Strategy Part One: ‘Effective management at protected sites, including estuaries and coasts for migrating

waterbirds; seabird colonies and other coastal breeding sites, and inshore and offshore marine areas.'

Since 2015, a number of marine SPAs have been classified for seabirds: 10 marine SPAs in English inshore and offshore waters, and 13 marine SPAs in Welsh inshore and offshore waters. In addition, there a number of SPA proposals for seabirds under consideration by governments (15 in Scotland, two in Northern Ireland, and two in England). In Wales, for example, this equates to the SPA network now covering 28.2% of inshore waters and 17.2% of inshore and offshore waters, including recent extensions to provide 'at sea' protection for seabird colonies and protecting a stable bird population across the region. There are a further 23 Welsh SSSIs to protect seabird breeding colonies. The protection afforded to these colonies extends beyond the boundaries of the SSSIs.

There are a number of conservation and management tools being employed to support seabirds. These include conservation advice packages, licensing, area-based tools such as site designations for seabirds, and non-spatial management approaches that can be more effective in addressing issues and threats to seabirds such water quality, marine litter, prey availability and climate change.

## **Issue raised: invasive predatory mammals, seabird habitats and biosecurity**

**Several respondents asserted that it is necessary for us to adopt a more precautionary approach to invasive mammal incursion on islands, strengthening biosecurity and eradication schemes and including all important seabird islands in assessments, not just those fully encompassed by SPAs.**

We recognise the urgency of protecting bird colonies from the threat of invasive terrestrial mammals. In view of this, we will be strengthening protection through adopting the following new operational target: "We will continue to enhance and protect marine birds by reducing the risks to island seabird colonies from invasive predatory mammals". This will be achieved through biosecurity and eradication management and measured using the existing indicator on invasive predatory mammal presence on seabird islands.'

Current biosecurity plans at each site were assessed by the RSPB who determined whether they would be sufficient or not, if implemented. The sufficiency was measured against the UK Rodent Eradication Best Practice Toolkit. The assessment found that at the Special Protection Areas that had no invasive predatory mammals, the risk of invasion was minimised by effective biosecurity at six sites and was partially reduced at a further ten sites. We do, however, acknowledge that there is a pressing need to continue preserve as many marine bird habitats as possible that are currently free of established invasive predatory mammal populations. The Biosecurity for Life project will work with island managers, conservation organisations such as the Royal Society for the Protection of Birds and Natural England, island communities and key marine industries to develop the

UK's capacity to implement seabird island biosecurity. In addition, Government will be leading on planning activities beyond the completion of the project in 2021.

In terms of scope of protection, there are currently 42 SPAs in the indicator, which contain a total of over 700 islands. These include all the SPAs in the UK that contain offshore islands and which were designated because of the national or international importance of their breeding seabird. The addition to the indicator of other seabird islands that are not in an SPA will be considered on a case by case basis.

### **Issue raised: marine bird categorisation**

**Some stakeholders felt that the categories of marine birds assessed do not sufficiently represent the species of seabird and waterbird that utilise marine and coastal habitats throughout their breeding and non-breeding life stages.**

We recognise there are gaps and are investigating how to better monitor seabirds and waterbirds at sea for the UK Marine Strategy Part 2, particularly those species that were not included in the current indicator assessments.

### **Issue raised: sea surface temperature and breeding success**

**It was considered, by two respondents, that an evidence gap exists concerning the relationship between Sea Surface Temperature (SST) and Kittiwake breeding success in the Celtic Seas in relation to the assessment of the indicator kittiwake breeding success. On this matter, one respondent recommended that research is undertaken to ascertain what impacts SST has on seabird breeding success and to identify the predominant drivers of breeding success in this Skomer Island, and that this research is developed as part of the Welsh Marine Evidence Strategy in development by Welsh Government and Natural Resources Wales.**

We are aware that Kittiwakes have declined across the UK in recent years and the decline is thought to be linked to a decrease in breeding productivity, related to a lower availability of prey such as sandeels and other small fish. This is thought to be linked to changes in the food chain as a result of rising sea temperatures. We developed an indicator on kittiwakes that considers the changes in their breeding success that are related to changes in sea-surface temperature to identify years when factors other than prevailing climatic conditions (e.g. fishing, extreme weather events) may be impacting on kittiwake productivity. This indicator could not be developed for the Celtic Seas because no relationship between sea surface temperature and kittiwake breeding success could be found. As we point out in the assessment, this is likely because sea surface temperature is not the primary driver of food availability on the west coast of the UK as a result of the



convoluted tidal currents in coastal areas. Kittiwakes in the Celtic Seas are also more reliant on other species of small fish, such as sprat and herring that are differently affected by sea surface temperature compared to sandeels.

## Changes to Descriptor 1 & 4: Birds in the updated Marine Strategy Part One resulting from the consultation

In view of the comments received and our responses detailed above, we will change the “Going forward” section in the updated UK Marine Strategy as follows.

Operational target in consultation document	Revised operational targets
<p>We will contribute to the further development of the assessment of bird populations and identify the most important pressures at a regional level through OSPAR. We will continue to enhance and protect marine birds through:</p> <p>a) management at protected sites onshore and offshore; such as reducing the risks to island seabird colonies from invasive predatory mammals;</p> <p>b) wider measures; such as delivering the UK Plan of Action on Seabird Bycatch and applying Environmental Impact Regulations for inshore and offshore activities; and</p> <p>c) achievement of the targets to reduce marine litter, particularly floating litter.</p>	<p>We will contribute to the further development of the assessment of bird populations and identify the most important pressures at a regional level through OSPAR. We will continue to enhance and protect marine birds through:</p> <p>a) effective management at protected sites;</p> <p>b) delivering the UK Plan of Action on Seabird Bycatch;</p> <p>c) reducing the risks to island seabird colonies from invasive predatory mammals</p> <p>d) achievement of the targets to reduce marine litter, particularly floating litter.</p>



## Summary of responses on the proposals for Descriptors 1 & 4: Fish

A number of issues were raised under the Fish ecosystem component that related strongly to Underwater Noise and Marine Litter policy. Those points have therefore been dealt with under Descriptors 10 and 11.

### Issue raised: fish population drivers

**We were asked to improve the assessment of population drivers other than fishing.**

We agree that it is necessary to consider temperature and other pressures on fish in addition to predator-prey interactions. We will address this through research on food web modelling, as identified in the “Going forward” section on D4 Food webs in the original Consultation document.

### Changes to Descriptor 1 & 4: Fish in the updated Marine Strategy Part One resulting from the consultation

The issues raised above do not require significant changes to the targets, operational targets and work going forward highlighted in Section 3 of the Consultation Document at this time.

## Summary of responses on the proposals for Descriptors 1 & 4: Pelagic habitats

### Issue raised: data limitations

**A respondent raised the concern that Descriptor 1 & 4 Pelagic Habitat assessments could not be described as accurate in light of the prevalent data gaps and limited scope of the included parameters.**

It has already been acknowledged that the assessment for this Descriptor is not robust. The only data currently available are the planktonic component of this system. However, the steps made towards recognising changes in pelagic habitats represent significant progress towards their management and the next phase of the UK Marine Strategy will

focus on interpreting these changes. In light of this, the research teams driving these assessments are working towards proposing indicators that would allow microbial and bacterial time series data, when they become available to be incorporated into the assessment.

## Changes to Descriptor 1 & 4: Pelagic habitats in the updated Marine Strategy Part One resulting from the consultation

The issues raised above do not require significant changes to the targets, operational targets and work going forward highlighted in Section 3 of the Consultation Document at this time.

## Summary of responses on the proposals for Descriptors 1 & 6: Benthic habitats

### Issue raised: knowledge of gear components interacting with the seabed

**A number of respondents requested that we improve our knowledge and understanding of the specific gear components interacting with the seabed.**

Improving our knowledge and understanding of the specific gear components interacting with the seabed will be very helpful to refine and improve the accuracy of the results. At present there are several projects to evaluate the results provided using VMS with others such as AIS, which we hope will help to improve the fishing data layers in the future. Working with the fishing industry to improve the data available, interpretation and calculation of impacts will be very important to improve the benthic indicators and communication of results. We are currently working on a few case studies testing the benthic indicators involving the fishing industry and we hope these type of case studies will extend and increase in the future.

**A respondent from the fishing sector proposed a fishing gear benthic impact reduction initiative.**

Improving our knowledge and understanding of the specific gear components interacting with the seabed will be very helpful to refine and improve the accuracy of the results. At present there are several projects to evaluate the results provided using VMS with other data such as AIS, which we hope will help to improve the fishing data layers in the future. Working with the fishing industry to improve the data available, interpretation and

calculation of impacts will be very important to improve the accuracy of the benthic indicators and communication of results.

We will assess the feasibility of setting up a partnership working group with key stakeholders to identify solutions for potential fishing impacts on seabed integrity.

## **Issue raised: robustness of benthic habitat indicators**

**One respondent highlighted some uncertainties concerning the robustness of the Infaunal Quality Index and OSPAR indicators ‘Extent of Physical Damage to Predominant seafloor habitats’.**

The gaps and uncertainties on the assessments have been fully captured under the results and the knowledge gaps sections. The assessments have been undertaken based on the best available evidence we currently have on the distribution and extent of fisheries and habitat and species sensitivity data. ICES also provided some useful advice on potential ways to improve and validate these methods which we are currently taking forward. The results from the physical damage indicator have been validated with those from indicator on the condition of benthic habitat communities and we are continuing to develop these improvements.

## **Issue raised: epibenthic species and habitats**

**It was noted by one respondent that ICES advice on seafloor integrity does not consider epibenthic species or habitats in both sensitivity and recoverability responses to impact by bottom towed fishing.**

It is correct that the ICES assessments only used infaunal data. However, the assessments we are presenting under the UK Marine strategy benthic indicators include infaunal and epifaunal species.

## **Issue raised: data and assessment limitations**

**Other uncertainties were addressed concerning the methods of assessment. These were namely concerning a lack of no-trawl zones, an omission of threshold definitions, the limited nature of the data drawn upon, and a need for better contextualisation of how each operational target will contribute to the achievement of GES.**

We have found the feedback very helpful and agree with comments and it should be noted that the suggestions will be incorporated in the knowledge gaps outlined on MOAT and considered for the planning to improve the indicators of seafloor integrity and benthic condition for the next round of assessments.

To give some examples, we are currently looking at different approaches to improve the data and methods being used for the evaluation of seafloor integrity and benthic condition within and outside MPAs, which will give us more accurate assessments in the future. Work is underway to develop better data for seabed impacts on benthic condition and food webs due to trawling in the UK EEZ.

## **Issue raised: cumulative impacts of marine industries**

**One respondent proposed that, in order to increase the likelihood of achieving GES, the cumulative impacts of marine industries on the seafloor must be addressed. This includes more emphasis to be placed on seafloor recovery, reform of fisheries management across UK seas with emphasis placed on stricter regulation in MPAs, increased data collection on all damaging activities which impact on the seafloor and a programme of stakeholder engagement.**

In relation to seafloor recovery, it should also be noted that, in many cases, the recovery of the benthic condition might take place over a long period of time, and that it will not always be possible for communities or habitat types to return to the original state due to the natural changes i.e. biological interactions, changes within the ecology of the areas and the influence of environmental drivers. On the technical side of MPAs regulation, it is possible to use the current evidence and the planned improvements on the current methods to inform discussions on sustainable fisheries management within and outside MPAs with regards to the condition of benthic communities. We agree with the need for stakeholder engagement.

## **Issue raised: recovery of benthic communities**

**Two respondents proposed that targets for the recovery of benthic communities should be set, and several knowledge gaps related to the benthic recovery were noted.**

Variables on the recovery of benthic communities and the ability to withstand impacts are already included within the indicators as part of the evaluation of the sensitivity to exposure of impacts. There are however, data gaps with regards to the timing and the probabilities of recovery of communities to the original state. However, obtaining this information is difficult, as the recovery of the benthic condition might take place over a long period of time, and it will not always be possible for communities or habitat types to return

to the original state due to the natural evolution of communities, caused by biological interactions, changes within the ecology of the areas and the influence of environmental drivers.

## **Issue raised: measures of damage to benthic zones**

**One respondent requested measures for the damage already caused to benthic zones.**

The purpose of the current assessments, that is to say the results of the extent of physical damage indicator, was to identify and quantify areas and habitat types under different levels of disturbance caused by a range of fishing gears, and not to determine specific types of measures that need to be put in place to reverse the impacts. However, the evidence is going to be used to inform the programme of measures, in particular for those habitats where resilience and ability to recover is currently being hampered by current activities.

## **Issue raised: seafloor physical damage**

**Respondents requested that impacts on the seafloor other than fishing should be given more consideration in the assessments.**

We agree that it is crucial to incorporate other anthropogenic impacts. The intention has always been for other activities to be incorporated. We are undertaking additional improvements to the method in order to incorporate data from other activities causing an impact to seafloor habitats, including inshore fisheries and other non-fisheries activities. This is currently being discussed at UK and OSPAR level to facilitate collaboration and coordination amongst stakeholders.

## **Issue raised: incorporating commercial fishing into assessments**

**One respondent stated that consideration needs to be given to how commercial fishing grounds can be incorporated into an assessment and still enable the area to achieve GES if the fishery is managed sustainably. Alongside this, they offered some valid suggestions for how this might be executed. These included: partially re-weighting the indicator assessment method to allow a 'set-aside' area for commercial exploitation, or, where a sub-area includes Marine Protected Areas (MPAs) that have fisheries management measures, incorporating these**

**management measures into a spatial weighting that may offset the negative impact in the same region of bottom-contacting fishing gear.**

These suggestions are being considered. For the extent of physical damage indicator, we are currently exploring approaches to improve the method on the evaluation of different levels of disturbance including within and outside MPAs, and areas of higher fishing intensity. An element of this work is exploring different ways to evaluate and propose potential trade-offs between areas and/or habitats under high levels of disturbance. In terms of MPA data, we will explore how additional information can be incorporated into the assessment results.

### **Issue raised: dredging**

**One respondent highlighted the issue of dredging on the Welsh coast, drawing attention to the status of Cardigan Bay.**

The majority of Welsh MPAs are closed to scallop dredge fishing under The Scallop Fishing (Wales) Order 2010, however, scallop dredge fishing is allowed within an area of the Cardigan Bay SAC from the start of November to the end of April each year. An annual Habitats Regulation Assessment is undertaken that demonstrates the proposed activities do not adversely affect the integrity of any European marine site. The Cardigan Bay SAC Bottlenose dolphin feature level was reported as being in Favourable conservation status (May 2017) by Natural Resources Wales (NRW).

### **Changes to Descriptor 1 & 6: Benthic habitats in the updated Marine Strategy Part One resulting from the consultation**

The consultation has proved extremely insightful in highlighting the priorities of stakeholders regarding Descriptor 1 & 6: Benthic habitats. We have flagged up some relevant activities in the above responses but the issues raised do not require significant changes to the targets, operational targets and work going forward highlighted in Section 3 of the Consultation Document at this time.

# Summary of responses on the proposals for Descriptor 2: Non-indigenous species (NIS)

## Issue raised: marine litter as a vector

**Some respondents highlighted the risk that marine litter poses as a non-indigenous species vector. They suggested an operational target to reduce marine litter to help slow the rate of introduction of new NIS.**

We agree that reducing marine litter could help to prevent the introduction of some non-indigenous species and have put forward some initiatives we are taking to achieve this in the section on Descriptor 10.

## Issue raised: NIS impacts on aquaculture

**Respondents raised concerns regarding the impact of NIS on aquaculture, particularly in light of increased potential for NIS introductions or establishment under climate change. They called for specific targets relating to aquaculture.**

A number of projects are underway to better understand and tackle NIS effects on aquaculture. A dedicated species action plan is in development to manage the carpet sea squirt, *Didemnum vellium*, whose colonies are a threat to the health of mussel and oyster beds. Two projects are tackling Pacific oysters; one is performing a comprehensive cost-benefit analysis on the Pacific oyster incursion, the other is developing population models to inform control decisions. In addition to this, work is ongoing to develop policy around the use of NIS in aquaculture.

It is worth mentioning that, while the impacts of NIS on aquaculture is a valid concern, the UK Marine Strategy and its assessments focus on the risk of introduction and spread of NIS across all species and habitats in UK waters. As such, the assessments evaluated in this consultation do not directly tackle threats to aquaculture, but the information produced will allow us to develop measures to reduce introduction and spread of NIS across all systems in UK waters, including aquaculture.

## Issue raised: progress on NIS action plans and knowledge gaps

**Respondents asked for clarification of what progress has been made to ensure timely implementation of action plans and to address knowledge gaps and to clarify the approach to the GES assessment.**

We acknowledge that the rate of introduction of NIS has remained unchanged and has always been presented as such. The indicator is designed to assess introductions rather than impact. The number of NIS records, rather than impacts, reflects how effectively we are preventing new introductions. This is a primary objective both nationally and internationally, including under the UK Marine Strategy.

We are working towards creating a more comprehensive monitoring programme of NIS. Monitoring for NIS in UK marine waters prior to the Marine Strategy being implemented was limited. In 2016, monitoring efforts increased and we look forward to our understanding of NIS status increasing in the near future.

It is agreed that there is still much to do in relation to the management of pathways of introduction, such as shipping. This requires much co-ordination between governments and devolved administrations and the scrutiny of many different legislative measures. As part of this effort, Defra have had several meetings with the Maritime and Coastguard Agency and Department for Transport to discuss progressing the implementation of the Ballast Water Convention and the importance of the convention in limiting the risk from a major pathway way has been expressed.

High risk locations have already been identified and further work is being progressed on how this process can be improved. Timescales for pathway action plan development and implementation need to link with the process being undertaken by the Great Britain Non-Native Species Secretariat for the Alien Species Regulations. We are anticipating a six year cycle for development and implementation.

Beyond this, rapid response to new introductions in the UK is managed by the Non-Native Species Secretariat. A risk based approach has already been adopted whereby high risk (i.e. invasive) NIS are identified. This is coupled with monitoring data to identify populations of these species. Effective species action plans are gradually being developed. Our ability to respond to new introductions on a national scale is robust, as demonstrated by our response to the introduction of large numbers of American lobsters into the south of England in 2015, but we will always strive for improvement.

## Issue raised: NIS spread

**A respondent put forward that the rate of spread of NIS as a result of human activities should be minimised and reduced where possible.**

We agree with this, as expressed in the target for non-native introductions “The rate of spread of invasive NIS, as a result of human activities is minimised and reduced where possible”.



## **Issue raised: additional criteria and targets for NIS**

**A respondent suggested a number of amended or new criteria and SMART targets for consideration to improve progress towards GES and additional research. The suggestions included NIS impact and monitoring criteria; biosecurity, training and ballast water targets. Operational target recommendations covered pathways analysis, introduction and spread assessments on a three year basis, rapid response measures, and quantitative NIS introduction aims.**

Additional targets, research and monitoring will be discussed in line with the suggestions relating to impact and better biosecurity. We will consider whether quantifiable aims and threshold values for species introductions are practicable under this policy. However, we must be mindful of the significant challenges in managing NIS in the marine environment, especially under the shifting conditions brought about by climate change.

Priority species relating to introductions and management have already been identified, but not included in this assessment. Rapid response measures NIS are managed by the GB Non-Native Species Secretariat. In addition, we would like to note that assessments of introduction and spread are conducted annually and then more comprehensively every six years, but due to issues with data licensing we are not in a position to distribute and publish the findings widely.

## **Changes to Descriptor 2: Non-indigenous species in the updated Marine Strategy Part One resulting from the consultation**

The consultation has proved extremely insightful in highlighting the priorities of stakeholders regarding Descriptor 2: Non-indigenous Species. We have flagged up some relevant activities in the above responses but the issues raised do not require significant changes to the targets, operational targets and work going forward highlighted in Section 3 of the Consultation Document at this time.

## **Summary of responses on the proposals for Descriptor 3: Commercial Fish**

### **Issue raised: data limitations**

**An industry respondent stated that the quality of data for assessing pelagic shelf fish and commercially fished shellfish is currently insufficient.**

At present some stock assessments are limited by current data collection and scientific difficulty, therefore further research into assessment methodology and indicators coupled with improved and expanded monitoring will be necessary to fill these data gaps. A number of research projects are underway to address these issues, including on improving scallop assessments through underwater TV surveys. We now hold over 30 years of time series of data for scallops in Northern Irish waters and are now in a strong position to evaluate trends in these stocks. The International Council for the Exploration of the Sea (ICES) and national institutes including Marine Scotland have also been developing a series of management indicators for data-poor stocks, such as Maximum Sustainable Yield (MSY) proxies which is allowing more MSY based assessments to be conducted on data poor stocks.

**One response pointed out that the information provided in the consultation draws upon data that is four years old. Given that significant pieces of legislation have been implemented since 2015, this is seen as outdated.**

We acknowledge that the assessment and sign-off process has resulted in us being unable to present more recent assessments. The national shellfish stocks are on a three year assessment cycle and the most recent assessments available at the time of reporting were from 2015. We have recently updated the quota stock assessment indicator however, for the sake of comparability, assessments from 2015 were used in this report. In 2019, 59% of quota stocks with an MSY assessment for which the UK had an interest were fished at or below the MSY level

The reference period does indeed pre-date recent regulations, but in some cases it would be difficult to detect significant impacts at this stage and it is important to demonstrate long term trends to fully appreciate the impact of management measures. In terms of reproductive capacity, any improvement may take years for results to become apparent due to the nature of long term improvement plans and the biology of some species (e.g. slow growth rates).

As reporting process will be more regular in the future, this knowledge lag will improve. While we have in fact recently updated the quota stock assessment indicator, the national shellfish stocks are on a three year assessment cycle so a complete update is only possible on this cycle.

**One respondent suggested that for data-limited stocks, a precautionary approach could be adopted to ensure they are resilient to change and protected in the long-term.**

The current approach of the government for data-limited stocks is to make progress towards addressing measurement gaps for data limited stocks and get MSY assessments where possible.

As mentioned UK scientists through ICES and their own institutes are actively engaged in the development of MSY proxies for data limited stocks and use them for multiple stocks

where a full MSY assessment is not possible. MSY proxies have been used as GES indicators for quota stocks where they have been internationally agreed through ICES.

**One respondent requested that a suitable MSY proxy be developed, with the intention of moving towards a full MSY assessment through the collection of more data.**

UK scientists are actively engaged in the development of MSY proxies and we have used these for GES indicators for quota stocks where they have been internationally agreed through ICES.

## **Issue Raised: suggestions for new fishing targets to achieve GES**

**NGOs requested that precautionary fishing targets were established in order to realistically achieve GES. It was also proposed that fishing targets should be more flexible, given the uncertainty surrounding how quickly it will take for species to recover to GES, as well as a need to recognise the importance of managing trade-offs in reaching MSY/GES and other fisheries objectives, such as minimising discards.**

The Government does recognise the need for flexibility around targets. Our intention is to have legislation in place to ensure we have established a legal framework to continue making progress towards achieving GES and that supports our international obligations to manage stocks towards MSY.

However, it is not simply in the UK's power to recover all fish stocks, as many stocks of interest to the UK do not exist solely in UK waters but are shared, so for these cooperation with other coastal States is essential. The UK has long been committed to sustainable fisheries, and we shall continue to work closely with our neighbours to ensure the sustainable management of shared stocks.

**It was suggested that specific GES targets should be set for the Aquaculture industry, given the industry's rapid growth, and the nature of the industry cutting across many of the GES Descriptors.**

It is not believed that a specific GES target for aquaculture is required, as that would require a target for all individual pathways, relating to a wide variety of production systems and species. However, we acknowledge the complexity of the issue in Scotland and actions to further improve the management and regulation of salmon farming are underway. These actions include the publication of Scotland's 10 Year Farmed Fish Health Framework, the creation of a Salmon Interactions Working Group, which will make recommendations for a future approach to managing farmed and wild fish interactions, advice that Environmental Monitoring Plans should be a condition of planning consents, a

review of Scotland's farmed fish sea lice policy (changes to strengthen the policy were announced on 5 June), and a strengthened Scottish Environment Protection Agency (SEPA) finfish regulatory regime, including a revised standard for organic waste depositions, enhanced environmental monitoring and a new enforcement unit.

In terms of aquaculture, the national average adult female lice level reported by industry in Scotland was at its lowest level for 6 years. Scottish Government announced changes to strengthen its sea lice compliance policy on 5 June. Changes included a lowering of the reporting and intervention thresholds and a commitment to introduce reporting legislation in 2020. Changes in the environment will have future implications for fish health. That is why Scottish Government has produced a co-owned 10-year farmed fish health framework which will provide a strategic and evidence-based approach to the short and long-term improvement in fish health in Scotland. This includes the establishment of a Climate Change and Ocean Acidification work stream. Discharges into the marine environment are strictly regulated by the Scottish Environment Protection Agency in order to ensure environmental impacts are minimised.

We are also aware that that aquaculture is a hot spot for invasive non-native species and this should be considered within the development of surveillance and monitoring programmes and data transfer. There are currently a number of actions to address specific concerns across the various sub-sectors of this diverse industry. Relevant actions include two codes of practice which were developed by industry to reduce the risk of the spread of non-native species with movements of juvenile mussels for relaying. Also relevant are the initiatives mentioned elsewhere in this document relating to a dedicated species action plan to manage the carpet sea squirt, *Didemnum vellium*, and Pacific Oyster research projects.

**NGOs requested that precautionary fishing targets were established in order to realistically achieve GES.**

UK scientists are actively engaged in the development of MSY proxies and we have used these for GES indicators for quota stocks where they have been internationally agreed through ICES. Through ICES the advice on the precautionary approach is given alongside that of the MSY approach. UK scientists are engaged within the observer programme to monitor catches at sea and this evidence is routinely used within stock assessments that are now based on total catches.

## **Issue Raised: better monitoring of bycatch and sustainable fishing required**

**Multiple responses suggested that remote electronic monitoring (REM) should be used for data collecting, giving its unbiased nature, reliability and cost-effectiveness. Additionally, it was proposed that vessel monitoring systems should**

**be carried by all vessels and remote electronic monitoring with CCTV for all large vessels.**

Unrecorded catches, whether ultimately landed or discarded, contribute significant uncertainty to the scientific assessment process and thereby enhance the risk that stocks are fished at levels beyond MSY and that fishing opportunities are not optimised. Accurate recording and reporting of total catch of quota species should be a key priority. The most efficient and cost-effective tools for scientific monitoring of fishing activity should be applied for the long-term sustainability of fish stocks.

We are exploring the potential use of Remote Electronic Monitoring (REM) in the future, alongside other monitoring and enforcement tools, as cost-effective and efficient way of monitoring fishing activity and ensuring compliance.

Some trials on REM have already been undertaken and have produced positive results and the UK will continue to consider the opportunities for use REM more widely post-EU Brexit, for large and small vessels.

## **Issue raised: accountability and legal enforcement of regulation relating to GES in fishing**

**Numerous respondents called for the Fisheries Bill to underpin a legal framework that could strictly regulate the fishing industry to help achieve GES, fish at MSY, and prevent illegal fishing**

Our intention is to re-introduce the Fisheries Bill which will put in place the framework to continue making significant progress towards fishing more stocks at MSY contributing to the achievement of GES. The Bill will set out clear objectives to ensure that fisheries and aquaculture activities are environmentally sustainable in the long-term, that we deliver on MSY in line with our international obligations, and that we apply an ecosystems-based approach to fisheries management measures that accounts for the full range of effects of fishing on ecosystem services, and corresponding societal needs in our decisions.

## **Issue raised: bycatch pressures**

**One respondent proposed to add seabirds to 'Table 3, pressures and associated activities in UK seas' in the consultation document, given that some species of birds particularly sensitive to bycatch in fishing gear.**

We have included "birds" in Table 3 of the updated UK Marine Strategy.

## Changes to Descriptor 3: Commercial fish in the updated Marine Strategy Part One resulting from the consultation

The consultation has proved extremely insightful in highlighting the priorities of stakeholders regarding Descriptor 3: Commercial fish. We have flagged up some relevant activities in the above responses but the issues raised do not require significant changes to the targets, operational targets and work going forward highlighted in Section 3 of the Consultation Document at this time. However, due to the impacts of fishing on birds, we will have included “birds” in Table 3 (Pressures and associated activities in UK seas) in the updated UK Marine Strategy.

## Summary of responses on the proposals for Descriptor 4: Food webs

### Issue raised: development of targets

**An industry body highlighted that the targets for food webs are not as strong as they were in the 2012 edition of the Marine Strategy Part One consultation.**

In 2012 the UK’s targets for food webs were very similar to those used under Descriptor 1 on biodiversity. They enabled us to assess each component part of the food web but they did not enable us to assess the interactions between them and thus, how well the food web is functioning. A Commission Decision has meant that we have had to redraft our food web targets, which are now much more focused on food web structure and function. Whilst we acknowledge that the food web targets have not become more specific or quantitative, we are constrained in target setting by the lack of research and development in the area. But we have proposed the following operational target: We will continue ongoing development of UK food web indicators and will work with other countries in OSPAR to: a) develop and test regional assessment methods that can also be used for assessing the status of food webs and b) establish the feasibility of setting threshold values for the UK targets.

Indeed, work has already begun to develop more bespoke food web indicators (see below). As we gain a better understanding of the variability in these indicators, we will become more confident in determining what is indicative of GES in relation to a healthy marine food web that is not significantly adversely affected by human activities.

## Issue raised: complexity of indicators

**NGOs suggested that the indicators used for measured food webs should be further developed in their detail and complexity if we are to implement an ecosystem approach to management of human activities.**

We agree with this comment and have previously identified this as a key area that food web assessments in future should pick up on. But since 2012 we have developed, in collaboration with OSPAR, two new food web indicators of fish community species composition and size structure. Furthermore, in annex 1 of the consultation document we highlighted further indicators that are already in development or will be developed to aid our understanding and assessment of food web structure and function.

## Issue raised: anthropogenic impacts

**A number of responses suggested that the impacts of anthropogenic behaviour should be incorporated within food webs assessments.**

The assessments of the food web indicators on fish community species composition and size structure and the Large Fish Index were closely linked to the impacts of fishing pressure. They provided an indication of how effective fisheries management measures have been in alleviating pressure and reducing impacts of fish communities. However, this is limited to one component of the food web and we agree that an incorporation of additional anthropogenic impacts and of other food web components would potentially tell us more about the impacts of human activities on the wider structure and functioning of the entire marine food web. As mentioned above, we aim to better understand the impacts of human activities on other parts of the food web, such on plankton. Also we have already started to develop more bespoke food web indicators that will incorporate all components of the food web.

## Changes to Descriptor 4: Food webs in the updated Marine Strategy Part One resulting from the consultation

The consultation has proved extremely insightful in highlighting the priorities of stakeholders regarding Descriptor 4: Food webs. However, the issues raised have not required a significant shift in the targets, operational targets or the aims of work going forward at this time.

# Summary of responses on the proposals for Descriptor 5: Eutrophication

## Issue raised: target assessment methods and reporting

**Several respondents suggested that the accuracy, contextual detail, and reporting of progress towards achieving Eutrophication targets require improvement.**

The assessments used were based on methodologies developed and used by the Contracting parties of the OSPAR Convention for assessing the Eutrophication Status of the North East Atlantic. We are confident that they provide a robust picture of eutrophication problems in UK seas.

The Marine Online Assessment Tool provides the scientific detail of the assessments and lists all the scientists across the UK which have contributed. The individual assessments of nitrogen, chlorophyll and dissolved oxygen also took into account peer reviewed findings from the wider scientific community.

## Issue raised: aquaculture as a source or sink for organic input

**Several respondents requested that a distinction be made between the input of organic material generally associated with aquaculture and the ecosystem services provided by bivalve aquaculture as a sink for organic input. They suggested that targets be introduced to develop the capacity of bivalve cultivation to address Eutrophication.**

The complexity of the drivers of Eutrophication make it challenging to develop targets specifically regarding bivalve cultivation, but the Clean and Safe Seas Evidence Group will be asked to assess whether this is feasible.

## Changes to Descriptor 5: Eutrophication the updated Marine Strategy Part One resulting from the consultation

The issues raised do not require significant changes to the targets, operational targets and work going forward highlighted in Section 3 of the Consultation Document at this time.



# Summary of responses on the proposals for Descriptor 7: Hydrographical conditions

## Issue raised: greenhouse gases targets for infrastructure developments

**NGOs suggested that new targets should be developed for the reduction of greenhouse gas emissions from significant marine infrastructure developments.**

We do not consider the development of new targets to be a priority as the Environmental Impact Assessment Directive and associated regulations already include requirements to minimise greenhouse gases and other gaseous emissions.

## Issue raised: cumulative impact mitigation

**A respondent recommended operational targets applying Environmental Impact Assessment along with the use of mitigation hierarchy, for marine planning across multiple areas of the Strategy. For example, 'D7 Hydrographical Conditions' refers to assessing the cumulative impacts of major developments and Marine Plans. In this case, applying Environmental Impact Assessment would be included in operational targets for measuring progress towards GES and in Marine Plans.**

All major developments must undergo Environmental Impact Assessment as a matter of law and we do not think it needs to be included as an operational target.

## Issue raised: target ambition

**An industry body stated that the current target for D7 regresses from the previous target of "all developments must comply with the existing regulatory regime and guidance should be followed to ensure that regulatory assessments are undertaken in a way that ensures the full consideration of any potential impacts, including cumulative effects at the most appropriate spatial scales to ensure that GES is not compromised".**

The new version states "All significant marine infrastructure developments must meet licensing conditions to ensure they do not adversely affect the marine ecosystem. We will further develop our approach to assessing the cumulative effects of major developments." The wording is simpler, but we would argue that this is stronger and clearer in its

requirement: "must meet licensing conditions to ensure they do not adversely affect the marine ecosystem".

## **Issue raised: climate change impacts**

**Some respondents highlighted that the impacts of climate change, such as hypoxia and ocean acidification, on marine biota and biogeochemical processes merit greater consideration within the Marine Strategy.**

A number of the comments we received for Descriptor 7 Hydrographical Conditions (D7) related to climate change. We believe there may be a fundamental misunderstanding of the purpose of the Directive regarding D7. Examples of activities causing hydrographical changes are given as offshore structures or transport infrastructure, which are local or regional issues. D7 should not include climate change as a result of human activities as climate change is necessarily considered to affect the prevailing conditions of the seas and measures to mitigate climate change are covered under other international and national legislation/obligations.

We agree that climate change is an important component of the prevailing conditions of the marine environment and for future updates to the marine strategy a specific assessment would be appropriate. In the case of oxygen, data availability and absolute levels is included in the oxygen indicator assessment for Descriptor 5 (Eutrophication) in the MOAT and can be referred to in the Marine Strategy Part One prevailing conditions Table 4.

## **Issue raised: using marine plans more effectively**

**An NGO called for effective implementation of marine plans to set licensing limits, address the cumulative impacts of anthropogenic activity and increase connectivity between marine and freshwater environments.**

We agree that marine plans have an important role to play in licencing marine industries and addressing the cumulative impacts of anthropogenic activity and have updated the going forward section of Descriptor 7 to acknowledge this.

## Changes to Descriptor 7 in the updated Marine Strategy Part One resulting from the consultation

<b>“Going forward” section in consultation document</b>	<b>Revised “Going forward” section</b>
<p>We will continue to assess significant infrastructure developments and their potential impacts on hydrographical conditions. Marine Plans, when in place, will enhance the regulatory framework for the licensing and consents process.</p> <p>We will continue to work with OSPAR in relation to cumulative effects, and to identify future potential developments likely to be of relevance to this Descriptor. This is particularly important in light of the anticipated increased pressure on the marine environment resulting from larger developments such as large-scale wind farms and tidal lagoons.</p>	<p>We will continue to assess significant infrastructure developments and their potential impacts on hydrographical conditions. Marine Plans, when in place, will enhance the regulatory framework for the licensing and consents process in conjunction with other relevant plans, including those relating to freshwater environments.</p> <p>We will continue to work with OSPAR in relation to cumulative effects, and to identify future potential developments likely to be of relevance to this Descriptor. This is particularly important in light of the anticipated increased pressure on the marine environment resulting from larger developments such as offshore wind energy generation alongside other activities and the need to plan for this in a way that enhances and protects the environment.</p> <p>We will use the results of on-going monitoring as well as improved understanding of cumulative effects to inform the review of marine plans.</p>

# Summary of responses on the proposals for Descriptor 8: Contaminants

## Issue raised: GES status not correct

**Several respondents claimed that the GES status for contaminants is not correct.**

We acknowledge that the GES status for Descriptor 8 is based on the limited number of legacy hazardous chemicals that the OSPAR Convention uses to assess the status of the North East Atlantic. For these chemicals, the concentrations, and particularly their biological effects, are generally meeting agreed target thresholds for protecting sea life.

Thus, GES has been 'largely' achieved on the basis of the chemicals assessed and it is recognised that legacy chemicals (such as PCBs) will prevent us 'fully' achieving GES in 2020.

Over the next couple of years, it is our objective to identify and prioritise contaminants of emerging concern which may pose risks to marine life. This will permit a broader spectrum of hazardous substances to be used to in the assessment of GES so we are not just reliant on using legacy chemicals which have either been banned / restricted for considerable periods of time.

Also, we recognise that it may be more accurate to amend the high level objective to include 'specified' contaminants.

## Issue raised: cumulative impacts of chemicals

**NGOs suggested that a cumulative impacts target be put into place with particular reference to fish farm inputs and combinations of contaminants on marine biota.**

We recognise the potential for localised contamination as a result of chemicals used in the aquaculture industry and we ensure that risks are minimised through regulatory bodies. For example, the potential environmental impacts of fish farms in Scottish waters are fully assessed by the Scottish Environment Protection Agency. Predictive modelling is used to estimate nutrient enhancement and benthic impact in sea lochs and to produce Marine Scotland's Locational Guidelines for Authorisation of Marine Fish Farms in Scottish Waters <https://www2.gov.scot/Resource/0054/00547770.pdf>

In terms of shellfish aquaculture, the carrying capacity of the water body is considered as part of any application.

Our target for the health of species and the condition of habitats (that biological or ecological effects on sea life due to contaminants are below thresholds agreed by OSPAR) goes towards addressing pressures on marine biota due to combinations of contaminants.

## Issue raised: contaminant ingestion by sea life

**A respondent recommended investigating the ingestion of microplastics and other contaminants entering the marine food web.**

We acknowledge that this is a concern and will support the proposed development of an indicator by OSPAR to assess the impacts of contaminants in marine mammals, which are near the top of the food chain, using data collected by the Mammals Stranding Programme.

We have operational targets for D10 litter to a) develop an indicator for micro-litter in sediment and biota, and b) establish, if practicable, whether the amount of litter and micro-litter ingested by marine animals adversely affects the health of the species concerned.

## Issue raised: preventing contaminants at source

**Several respondents suggested introducing targets to reduce production and emission of contaminants, taking into account the pathways, such as waste water, between the terrestrial or freshwater environments and the marine environment.**

Plans of this level of detail will be dealt with in the updated Programme of Measures in 2021. However the “source to sea” approach, which tracks or models contaminants from where they enter surface waters to where they end up in the sea, is being increasingly used in river basin management planning. The links between aquatic and terrestrial habitats have been the subject of recent discussion and will be tackled in England by developing and applying an indicator for the exposure and adverse effects of chemicals on wildlife in the environment to meet the 25 Year Environment Plan goal of managing exposure to chemicals. This indicator will track changes in the exposure of wildlife to harmful chemicals in freshwater, marine, coastal and terrestrial ecosystems. In addition, research will be performed by the UK water industry and from 2020 in the national Chemicals Investigation Programme to understand the management of trace contaminants in domestic wastewaters discharging to coastal and transitional waters. The outputs from these investigations will improve our understanding of the effectiveness of treatment and removal processes for legacy and other micro-level contaminants.

## **Issue raised: improving information on chemicals of possible concern and developing or updating chemical threshold values**

**Respondents asked for a clear process to be formulated to revise threshold values as new evidence emerges.**

We will work nationally, and with others, including OSPAR countries, to ensure we have a broader understanding of the risks posed by contaminants of emerging concern for the purposes of revising current threshold values and developing new ones.

In 2018, The International Council for the Exploration of the Sea (ICES) prepared a report for OSPAR identifying those substances of possible concern for the marine environment based on production volumes and uses. Within the UK, the competent monitoring authorities had a look at these chemicals and discussed which would pose a likely risk to the marine environment. In parallel, the European Chemicals Agency (REACH) regulation the European Chemicals Agency is evaluating possible risks of chemicals. Most of these chemicals are from land-based sources and in future, may be considered as candidate substances under the Water Framework Directive's (WFD) watch list process. After it has been assessed which chemicals are detectable and which are considered to pose potential biological effects in coastal, traditional and marine waters, the threshold values or environmental quality standards can be derived and established.

The UK will also continue to develop analytical-instrumental screening techniques and methods using the likes of gas or liquid chromatography with mass spectrometric detection to better identify a wide range of contaminants of emerging concern entering surface waters and the marine environment to help evaluate risks, and develop strategic monitoring programmes.

Furthermore, as more robust toxicological information becomes available, e.g. on secondary poisoning, we will work in OSPAR to update threshold values.

## **Issue raised: scope of chemicals assessed needs developing**

**A number of respondents pointed out that the list of chemicals included in the assessment needs to be expanded.**

We recognise the need to improve our assessment of the risks posed by the wide spectrum of chemicals entering the marine environment and to expand our assessment and monitoring programmes accordingly.

We are doing this nationally through investigative monitoring of chemicals of emerging concern carried out by CEFAS and other UK marine organisations, which evaluate whether targeted chemicals are likely to pose risks, and through initiatives such the

'Prioritisation and Early Warning System for contaminants of emerging concern in the aquatic environment being developed by the Environment Agency.

At regional level, we contribute to the work that the OSPAR Hazardous Substances and Eutrophication Committee is carrying out to update the OSPAR lists of Chemicals for Priority Action, and Possible Concern, based on updated risk assessments of chemicals likely to reach the marine environment.

We also participate in the surface water Watch List (WL) programme of potential water contaminants. These substances require monitoring to determine the spatial distribution of their presence and the risk they pose to the wildlife and human health and whether Environmental Quality Standards (EQS) should be set for them.

UK agencies also participate in the NORMAN network of European reference laboratories, research centres and related organisations for the monitoring and biomonitoring of emerging environmental substances which has developed lists of chemicals of emerging concern.

## Changes to Descriptor 8 in the updated Marine Strategy Part One resulting from the consultation

In the light of the responses received we have made the following changes to the Section on D8 Contaminants in Section 3 of the Consultation Document.

a) the High level objective has been modified as follows: "Concentrations of specified contaminants in water, sediment or marine biota, and their effects, are lower than thresholds that cause harm to sea life, and are not increasing".

b) the operational targets have been modified as shown in the following table.

<b>Operational targets in consultation document</b>	<b>Revised operational targets</b>
Work with other countries to establish common threshold values for contaminants and their effects where necessary	Work nationally and with other countries to establish common threshold values for contaminants and their effects where these pose risks to marine life.
Work nationally and with other countries to identify chemicals of emerging	Work nationally and with other countries to identify chemicals of emerging

concern and develop common management actions.	concern which pose risks to marine life and develop common lists and management actions by 2022.
Work with other countries to investigate the cumulative effects of combinations of contaminants on sea life populations.	Work nationally and with other countries to investigate the cumulative effects of combinations of contaminants on sea life populations and take appropriate actions

## Summary of responses on the proposals for Descriptor 9: Contaminants in seafood

### Issue raised: “GES achieved status” may change in the light of the revision of threshold values

**Several NGOs indicated that it was encouraging to see the high level of compliance with regulatory limits for the fish tested, but pointed out that many of the limits are under consideration for revision and were not confident that the current assessment would be maintained.**

Descriptor 9 covers contaminants for which limits are set out in Regulation (EC) No 1881/2006 although general food law would apply to additional contaminants not listed in Regulation (EC) No 1881/2006 but which have been identified as being of emerging concern in seafood and for which exposure can be shown to be unsafe on the basis of risk assessment using established Health-based Guidance Values (HBGVs).

We have always been clear that there is a possibility of regulatory changes concerning regulatory limits under contaminants legislation in the light of new information. New limits will only be established following a risk-benefit analysis on fish consumption that EFSA carries out and the Food Standards Agency participates in the discussions concerning these changes.

If new regulatory limits are agreed for existing or new substances, and future monitoring programmes show that there is a change in compliance, then we would have to modify the GES status accordingly.

In any event, we recognise that new chemicals or groups of chemicals of concern are continually being identified and welcome engagement with stakeholders in prioritising these for future investigation subject to resource availability.



## Issue raised: assessment sample size not sufficient for robust assessment

Several NGOs suggested that the limited number of substances and the small sample sizes mean that they cannot be confident that the Descriptor 9 assessment provides an accurate reflection of contaminants in seafood.

We do not agree that the number of substances was limited. Our assessment for Descriptor 9 included a range of environmental contaminants that went well beyond those that are currently regulated under regulation 1881/2006 and also targeted the fish species at highest risk of contamination. The contaminants measured included brominated flame retardants, brominated and mixed halogenated dioxins and biphenyls, perfluorinated alkyl substances and polychlorinated naphthalenes, as well as some legacy pesticides and heavy metals.

We are also confident that the sample size, species of fish and range of locations, which included commercial fishing grounds within the Greater North Sea and the Celtic Seas, including a small number of samples from adjacent waters but destined for the UK market, was sufficient to get a good picture of the state of compliance of the safety of seafood for human consumption under this descriptor.

## Changes to Descriptor 9 in the updated Marine Strategy Part One resulting from the consultation

In the light of the responses received we have made the following changes to the Section on D9 Contaminants in Seafood in Section 3 of the Consultation Document.

<b>“Going forward” section in the consultation document</b>	<b>Revised “Going forward” section</b>
We will continue to carry out appropriate periodic risk-based surveys to check that agreed safety levels continue to be met.	We will continue to carry out appropriate periodic risk-based surveys to check that agreed safety levels continue to be met.  We recognise that new chemicals or groups of chemicals of concern are continually being identified and we will

	prioritise these for future investigation subject to resource availability.
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## Summary of responses on the proposals for Descriptor 10: Marine litter

A significant number (49) of issues were raised with regards to marine litter.

### Issue raised: tackling marine litter at source

**It was suggested by a number of respondents that the UK Marine Strategy would be more effective overall if the scope of initiatives relating to marine litter took account of all sources of litter entering the sea.**

The various national and regional litter and waste strategies mentioned in the “progress and actions since 2012” section of the consultation document all embrace the concept that litter needs to be tackled at source, and aim to reduce litter through reducing, reusing and recycling associated materials, therefore contributing to the protection of the marine environment and we will continue to work closely across UK Administrations and with OSPAR countries, including the Republic of Ireland to ensure a coordinated approach.

DAERA will also shortly commence funding of a PhD titled ‘The distribution, abundance and impacts of plastic pollution in Northern Ireland’s freshwater ecosystems.’ This will provide evidence to inform future monitoring plans in freshwaters.

### Issue raised: more ambitious targets

**We received numerous comments that urged the UK government to set both more ambitious and more specific targets in relation to the reduction of plastic pollution, especially in relation to waste water treatments, port reception facilities, the significance of ghost gear in fishing, and ingestion by mammals.**

A number of the suggestions made were looking at potential future measures and not proposing new targets. There is ongoing work and investigation on developing appropriate measures to address most of these issues and these will be consolidated into the upcoming update to the UK Marine Strategy Part Three Programme of measures.

Through OSPAR the UK is co-leading a study to improve our understanding of the issue of fishing gear as a source of marine litter across the OSPAR area. This study will specifically look at best practices for gear recycling and innovation.

An indicator for micro litter is currently under development. This is a complex process and until we are further along the line it is difficult to set a date for its deployment.

## **Issue raised: aerial surveying for monitoring litter**

**One recipient suggested extending the use of aerial surveying from observing marine mammals to additionally counting floating litter, as is undertaken in Scotland through the SCRAPbook project.**

Aerial surveys for floating at sea are very expensive and not very effective due to the size of litter items that can be identified and difficulties in rough sea states. The SCRAPbook project is identifying hotspots for litter on the coastline.

## **Issue raised: ingestion of plastic litter**

**Three respondents stressed the need for the UK government to establish the extent to which the ingestion of marine plastic litter by animals has an adverse effect on the health of the species concerned, including the possible transfer into the food chain.**

We have adjusted the language in the UK Marine Strategy Part One on by-catch and plastic ingestion by seabirds to reflect the current research on the effects of plastics on UK seabirds.

The transfer of contaminants from microplastics to the food chain is not sufficiently well established yet and needs further evidence. However, we are currently working to develop rigorous protocols to standardise approaches.

## **Issue raised: floating litter monitoring**

**The suitability of the use of fulmar indicator for floating litter was highlighted.**

The UK is a member of OSPAR, which has been using data on litter in fulmar stomachs as a proxy for floating litter for some time. Presently, we are discussing an alternative to this proxy. The UK will continue to work through the OSPAR Marine Litter Working Group to develop targets, indicators and assessment methods to monitor floating litter.

## Issue raised: microfibres from synthetic fishing gear

Concerns were raised around microfibre release during fishing activities from dolly ropes. It was suggested that it could be reduced by finding alternative materials or banning the use of dolly ropes if such alternatives cannot be found within the next 3 years.

The UK is working together with other countries in OSPAR to improve our understanding of the issue of fishing gear, including ropes and nets, as a source of marine litter. We are co-leading a study which will look at this issue across the OSPAR area and will inform future policy actions.

## Issue raised: knowledge hub

A public knowledge hub was proposed, where government requests for public science data can be outlined; and increased participation in schemes to reduce marine litter from the fisheries sector.

This is a helpful idea which will be considered in the framework of the citizen science initiative mentioned in updated Marine Strategy Part One.

## Changes to Descriptor 10 in the updated Marine Strategy Part One resulting from the consultation

In the light of the responses received we have made the following changes to the Section on D10 Litter in Section 3 of the Consultation Document.

<b>“Going forward” section in consultation document</b>	<b>Revised “Going forward” section</b>
We will work both nationally and with other countries in OSPAR to develop a clearer quantitative definitions of GES if feasible, and continue to develop appropriate measures building on the OSPAR Litter Action Plan to reduce the input of different litter types.	We will work both nationally and with other countries in OSPAR to develop clearer quantitative definitions of GES if feasible, and continue to develop appropriate measures building on the OSPAR Litter Action Plan to reduce the input of different litter types.
We will also work internationally with the	We will also work internationally with

<p>relevant organisations (IMO, UNEP, FAO) and Commonwealth Countries to develop marine litter action plans and measures worldwide.</p> <p>We will work in OSPAR to develop an indicator for microplastics in sediment.</p>	<p>the relevant organisations (IMO, UNEP, FAO) and Commonwealth Countries to develop marine litter action plans and measures worldwide.</p> <p>We will work in OSPAR to develop an indicator for microplastics in sediment.</p> <p>We will investigate the feasibility of using more robust alternatives to the fulmar indicator for the assessment of floating marine litter.</p>
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## Summary of responses on the proposals for Descriptor 11: Underwater noise

### Issue raised: noise management and targets for future risk

**Concerns were raised that there is no mechanism in place to look at potential future noise impact and implement management measures and that GES targets should be expanded to consider the future risk of underwater noise.**

The UK Marine Noise Registry (MNR) collects data on planned (regulated) noisy activities in addition to its main remit of collecting retrospective information on when and where the relevant activities took place. The 'forward look'/proposed activity data represents estimated, planned information regarding the activities. Currently, the primary purpose for collecting 'forward look' data is to generate a list of planned activities and their expected end dates which are then used to set deadlines for the submission of 'backward look' data (via a close-out report). However, there is potential to use that data to inform, in particular, cumulative impact assessments and also noise management measures and this will be looked at in the future. We will also continue to work with regulators to fill in current gaps in MNR coverage. Those gaps and associated caveats and limitations are published yearly alongside MNR outputs.

Also, the UK is working with OSPAR colleagues to develop a new impact indicator addressing the risk of impacts of noise pressures on marine wildlife. This will be based on the assumption that exposure to noise pollution is an indicator of the risk of impact, and allows for an estimation of the proportion of population/habitat exposed and the length of exposure. It does allow for the inclusion of mitigation measures, such as noise reduction technologies. We will continue to work with other international organisations such as the IMO on the regulation of underwater noise and specific measures will be outlined in the forthcoming updated UK Marine Strategy Part 3: Programme of Measures.

## Issue raised: GES targets for underwater noise

**Several stakeholders requested that clearer and more defined targets need to be put into place in relation to the achievement of GES for underwater noise, including anthropogenic noise. It was also proposed that a comparison analysis of any trends in impulsive block days should be included in the future assessment, and compared to this assessment.**

We are working to more clearly define the targets relation to the achievement of GES for underwater noise. OSPAR is developing a risk of impact indicator for impulsive noise and the GIS tools being developed for continuous low frequency noise will also allow us to have a better understanding of potential impact. Also there is ongoing work at EU level through the Technical Group on Underwater Noise (TG Noise) to develop thresholds.

The threshold values derived for GES under Descriptor 11 will apply to cumulative levels of noise-generating activity. We will then set targets to achieve compliance with these threshold values, which will be reflected by licencing decisions. The assessment of impacts at this strategic level will be conducted in accordance with the agreed indicator methodology, and is necessarily a separate process to the assessment of impacts at the scale of individual activities/projects.

## Issue raised: additional research

**There were several calls for additional research into underwater noise, and research that would be coordinated on a wider scale including the need for research into cetacean populations, expanding the noise registry to include high frequency noise, and better understanding of cumulative underwater noise.**

Regarding protected species, we are looking at ways to increase our knowledge on the impact of water noise on cetaceans. We are looking into increasing the frequency of the SCANs surveys and making better use of citizen science observations. JNCC is leading a new Defra-funded project to make better use of other sources of monitoring data including industry and NGO sources, in order to enable analyses at relevant spatial and temporal scales. In addition, the COMPASS project, among others, will continue to gather acoustic data and the HBDSEG are committed to a programme working of integrated monitoring in the UK.

We are also looking at collecting additional data on the characteristics of sound such as levels and frequencies or proxies such as airgun array size and hammer energy. As data collection further improves and we have more confidence in that sound characterisation data and how that relates to effects on species, it is possible that more in depth analyses will be possible in the future.

The UK plays a leading role in two regional expert groups on underwater noise to foster collaboration between countries and institutions and also to identify research gaps. It is beneficial to have several groups identifying and commissioning research on impacts to cetaceans as there are different drivers and priorities depending on industry type for example. There are two ongoing projects that have benefited from a regional approach – JOMOPANS and JONAS.

Research is also being carried out to develop the noise registry. The sources of noise chosen for the noise registry follow TG Noise Guidance. The expert group made the decision to leave out higher frequency sounds >10Khz (e.g. vessel echo sounders) as these sounds don't propagate very far from the source and so any effects will be very localised.

Finally, steps are being taken regarding cumulative noise impacts. Once thresholds for the effects of underwater noise on marine wildlife are established through regional cooperation, we can then investigate the need to manage cumulative levels of noise, which would be reflected in licensing decisions. As a first step towards this, work is underway to develop an indicator of the effects of noise.

## **Issue raised: regional targets**

**A number of respondents suggested that targets should be set at a regional sea level.**

The noise reduction target was discussed at an OSPAR North East Atlantic level, but it was decided that as the monitoring and indicators were not yet in place it was too early to take this forward.

## **Issue raised: plan of action to minimise impacts of underwater noise**

**An NGO called for the implementation of a noise reduction strategy by 2021.**

We recognise that this needs to be addressed, and will explore the feasibility of developing a marine noise management strategy with relevant competent authorities, scientists and stakeholders. We have included this as an operational target in the updated Marine Strategy Part One.

## Changes to Descriptor 11: Underwater noise in the updated Marine Strategy Part One resulting from the consultation

In the light of the responses received we will make the following changes to the Section on Descriptor 11 Underwater noise in Section 3 of the Consultation Document.

<b>Operational target in consultation document</b>	<b>Revised operational target</b>
<p>We will work nationally and with other countries, particularly in OSPAR to:</p> <p>a) conduct research to establish relevant information on the impacts of sound on marine animals.</p> <p>b) establish threshold values for levels of anthropogenic impulsive sound and anthropogenic continuous low frequency sound taking into account research on impacts and regional or subregional specificities.</p>	<p>We will work nationally and with other countries, particularly in OSPAR to:</p> <p>a) conduct research to establish relevant information on the impacts of noise on marine animals.</p> <p>b) establish and apply quantitative targets for levels of anthropogenic impulsive sound and anthropogenic continuous low frequency sound taking into account research on impacts and regional or subregional specificities.</p>

<b>“Going forward” section in consultation document</b>	<b>Revised “Going forward” section</b>
<p>We will work with other countries sharing our seas to develop threshold values for levels of impulsive and continuous sound which are likely to cause harm at population so that common quantitative targets can be established in the future.</p> <p>We will work in international forums such as IMO to ensure that continuous underwater noise from shipping is robustly controlled at global level.</p>	<p>We will explore the feasibility of developing a marine noise management strategy with relevant competent authorities, scientists and stakeholders</p> <p>We will work with other countries sharing our seas to develop threshold values for levels of impulsive and continuous sound which have the potential are likely to cause harm at the population level so that common quantitative targets can be established in the future.</p>



	<p>We will work in international forums such as IMO to ensure that continuous underwater noise from shipping is robustly controlled at global level.</p>
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## Annex A: list of consultation questions

**Question 1:** Does the UK Marine Strategy Part One provide an accurate reflection of the state of UK marine waters and the economic and social uses of those waters?

**Question 2:** To what extent are the proposed new criteria and associated targets sufficient to guide progress towards achievement of GES?

**Question 3:** To what extent are the proposed operational targets sufficient to achieve GES?

**Question 4:** Where gaps have been identified do you have suggestions on how these could be filled?

## Annex B: respondents and comment summaries

### List of respondents

ALGAO UK Maritime Committee

Anglian Water Services Ltd

Anglo-North Irish Fish Producers Organisation (ANIFPO) Aquaculture Initiative European Economic Interest Grouping (EEIG) Bournemouth University

Bridgend County Borough Council

British Association for Shooting and Conservation (BASC)

British Ecological Society

British Trust for Ornithology

Chartered Institute for Archaeologists

CHEM trust

CIEEM

Council for Nature Conservation and the Countryside (CNCC)

EDF Energy

Energy UK

Environment Links UK

European Subsea Cables Association

Flamborough Head European Marine Site Management Scheme

Historic England

IAGC

Individual (2)

Keep Northern Ireland Beautiful (KNIB)

Keep It Green  
 KIMO international  
 Marine Biological Association  
 Menai Strait Fishery Order Management Association (MSFOMA)  
 National Federation of Fishermen's Organisations (NFFO)  
 Northern Ireland Marine Task Force (NIMTF)  
 Royal Yachting Association  
 RSPB  
 Scottish Fishermen's Federation (SFF)  
 Scottish Power Renewables  
 Scottish Water  
 Seabed User and Developers Group  
 Seafish  
 Society for Underwater Technology  
 Southern Insure Fisheries and Conservation Authority (Southern IFCA)  
 Statutory Advisory Council to the Department of Agriculture, Environment and Rural Affairs  
 The Crown Estate  
 The Heritage Alliance  
 The Honor Frost Foundation (HFF) Steering Committee on Underwater Cultural Heritage (UCH)  
 The Wildlife trust  
 UKELA  
 University of Plymouth  
 World Animal Protection  
 WWF

## Descriptor comment summaries

Table 1: The number of comments received referring to each Descriptor

Descriptor	Number of comments
1 & 4: Cetaceans	35
1 & 4: Seals	24
1 & 4: Birds	65
1 & 4: Fish	12
1 & 4: Pelagic habitats	6

1 & 6: Benthic habitats	31
2: Non-indigenous species	26
3: Commercial Fish	73
4: Food Webs	24
5: Eutrophication	7
7: Hydrographical conditions	13
8: Contaminants	20
9: Contaminants in seafood	7
10: Marine litter	49
11: Underwater noise	33