

# Marine Strategy Framework Directive consultation: UK Marine Monitoring Programmes

A joint response from Wildlife and Countryside  
Link, Scottish Environment LINK, Wales  
Environment Link and the Northern Ireland Marine  
Task Force

March 2014



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**Introduction**

- Wildlife and Countryside Link, Scottish Environment LINK, Wales Environment Link and the Northern Ireland Marine Task Force work together to achieve better protection for marine wildlife and effective management of all UK seas. Each is a coalition of environmental voluntary organisations, united by their common interest in the conservation and enjoyment of wildlife, the countryside and the marine environment. A list of the constituent members of each coalition is provided in Appendix 1 to this response. We welcome the opportunity to provide comments on the Marine Strategy Framework Directive (MSFD) consultation on UK Marine Monitoring Programmes.

**Summary of Comments**

- Overall, we are concerned that the proposed MSFD Monitoring is largely based on existing surveys, with very little new monitoring proposed. It is our view that this current planned approach to monitoring will mean that the UK and devolved governments will not have the necessary tools in order to assess GES in 2016. This will therefore result in the UK failing to deliver GES and therefore the MSFD by 2016/2020.
- We are also disappointed about limitations with respect to the development of targets and indicators and monitoring programmes for a number of Descriptors. For example, despite Charting Progress 2, the Scottish Marine Atlas and the Initial Assessment identifying serious concerns with a number of fish populations particularly sharks, skates and rays, and diadromous fish, and because of the limitations in the ability to assess these as well as deepwater fish and coastal fish, the targets, indicators and monitoring programmes simply do not address these fish groups. It is disappointing that at this stage, with only six years for GES to be achieved, there is still a lot in development or not yet operational e.g. targets, indicators and monitoring programmes to address deepwater fish, cephalopods, coastal fish, cetaceans, seabird bycatch, pelagic and benthic habitats. Our concerns about the lack of ambition in the proposed targets and indicators which will be monitored were highlighted in detail in a previous Joint Links MSFD response.<sup>1</sup>
- We are also very disappointed that currently no new monitoring is proposed for marine mammals, and the proposed monitoring programme is based solely on existing programmes.
- We also note that the European Commission's recent assessment of the first phase of implementation of MSFD (Article 12 review) raised concerns about the lack of

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<sup>1</sup> [http://www.wcl.org.uk/docs/Link\\_response\\_to\\_MSFD\\_180612.pdf](http://www.wcl.org.uk/docs/Link_response_to_MSFD_180612.pdf)

coherence of Member States within the same regions/sub-regions. It is important that the UK coordinates its monitoring programme proposals with those of other countries in the North East Atlantic via OSPAR and more widely in Europe via the relevant EC working groups. This will optimise opportunities for collaboration.

### **Descriptors 1 and 4: Fish**

- We are disappointed that the consultation does not propose any new monitoring programmes in relation to Descriptor 1 and 4 fish. While existing surveys including the International Bottom Trawl Survey (IBST), English Beam trawl survey, Scottish deepwater survey and herring acoustic surveys will form the basis of the monitoring programme for fish along with the unspecified, small, local scale monitoring programmes around the UK, these surveys focus largely on commercial finfish, such as herring, whiting, cod, haddock, and mackerel, leaving major gaps in the proposed monitoring programme in relation to a number of fish or fish groupings identified as being particularly vulnerable by Charting Progress 2, the Scottish Marine Atlas and by the UK Initial Assessment. Continuing with the status quo will also mean that where geographical monitoring gaps exist already (e.g. a lack of coordinated approach to IBST and beam trawl survey within the Celtic Seas region), such areas will continue to go under-surveyed. Furthermore, the targets for Descriptors 1 & 4 have been based only on offshore assessments of demersal fish species, due to existing gaps in monitoring of pelagic, deep-sea and coastal fish species, leading to inadequate data to enable the development of these targets. As a result, there is nothing proposed to address those fish identified by Charting Progress 2 and the UK Initial Assessment as being vulnerable and for which populations have continued to deteriorate, that is sharks, rays, skates, eels, salmon, and sturgeon. Indeed, one could argue that under NERC act duties, government has a duty to monitor condition of all Biodiversity Action Plan species. Many of these are fish species<sup>2</sup> in UK waters.
- Under the proposed Scottish National Marine Plan, Scottish Government has also developed a list of Priority Marine Features many of which are fish species, some with no current monitoring and so with unknown statuses – sandeels, for example.
- The UK Initial Assessment identifies that there have been improvements in the status of demersal fish probably due to a reduction in fishing pressure (decommissioning of vessels, and reduced 'days at sea' effort, particularly for offshore fleets) and that fish communities in estuaries have benefitted from improvements in water quality. However, the Assessment raises particular concerns about the status of threatened and vulnerable species such as sharks, skates, rays, deep sea species and diadromous fish such as the European eel and salmon. It highlights the need for improved information in relation to the causes of declines in diadromous fish populations (the Feeder Report identifies lampreys, sturgeon and shads as requiring additional research) and oceanic sharks. The Scottish Marine Atlas indicates that, though the species trend for demersal fish in most of Scottish waters is stable, there are some concerns in eastern waters. In particular species richness, diversity and size show long term declines, some of these trends persist into short term declines. This is the case for East Scotland Waters, the Forties and Fladens.

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<sup>2</sup> Including, 13 species of sharks, skates and ray, European eel, Atlantic salmon, allis and twaite shad

- The lack of any monitoring programme focused on shark, skate and ray populations is a major concern, not least because angel shark and common skate have disappeared from the Southern North Sea, and some authors believe that a blue shark population has disappeared from the Rockall Bank and Trough region. The Charting Progress 2 Feeder Report regional assessment identified that thornback ray, angel shark and blonde ray have been absent from Start Bay in on the southwest coast in recent years, while recent data from surveys in the Celtic Sea suggests that the composition of catch has changed with higher trophic level species including sharks and rays decreasing markedly. In the Irish Sea a comparison of data collated between 1901 – 1907 and 1989 – 1997 found that some species had disappeared including angel shark while others have increased in abundance such as lesser spotted dogfish. The Scottish Marine Atlas indicates that there are many concerns for shaks and rays in all areas of Scottish waters and presents negative trends for all regions where data are available. Dramatic changes have already occurred in shark, ray and skate populations and monitoring of these populations in UK waters is fundamental to understand current trends, pressures and changes in population status. That no trends were available in Faroe Shetland Channel, Fladen, Rockall, Bailey, Forties and East Shetland indicates that the current monitoring regime is not fit for purpose – MSFD monitoring must fill this gap.
- With respect to diadromous fish, in the Western Channel / Celtic sea region there has been a long term decline in the rate of capture of adult eels and recruitment of elvers, and also signs of a long-term decline in twaite shad populations. Dramatic declines have been experienced in salmon numbers from a number of rivers in the Minches and Western Scotland regions since the 1970s. Between 1890 – 1896, around four hundred to one thousand Atlantic sturgeon were caught each year in the North Sea, but now it is very rarely found, and is functionally extinct from this range. Monitoring will be essential to assess current status and trends in diadromous fish populations, and to understand and quantify the pressures.
- The UK's Initial Assessment identifies that while data are scarce for deep-water fish assemblages, the diversity of deep-water fish communities has been reduced in areas subject to deep-water fisheries. Monitoring is again essential to quantify the status and trends in deep-water fish communities and to quantify the pressures.
- The targets and indicators developed in the UK's Initial Assessment focus on the distribution of sensitive fish species, population of sensitive fish species, and size composition of fish communities, and do not specify any particular fish species or groups that will be monitored to measure progress towards GES. For GES to be achieved for Descriptors 1 & 4 fish, it is essential that the targets and indicators are achieved with respect to all the functional groups identified for the purposes of the MSFD assessments and relevant to UK waters i.e. diadromous fish, coastal fish, pelagic fish, pelagic elasmobranchs, demersal fish, demersal elasmobranchs, deep-sea fish, and deep-sea elasmobranchs. We believe the omission of any monitoring programmes focused on sharks, skates and rays (pelagic elasmobranchs, demersal elasmobranchs, deep-sea elasmobranchs for the purposes of the MSFD assessments), diadromous fish, deep-sea fish and coastal fish is a major gap in the proposed monitoring programme for Descriptors 1 & 4 fish and will prevent GES being achieved for these descriptors.
- Currently there is another gap in the proposed monitoring programme with respect to the non-commercial fish species which form an important part of the diversity of UK

waters, indeed the UK Initial Assessment recognises that there are more than 330 species of fish inhabiting the shelf seas of the British Isles.

- We recognise that the consultation document identifies a number of areas of work with respect to Descriptors 1 & 4 fish, which are still in development, including the development of targets and indicators for cephalopods which is due this year, and which is very welcome. Other areas of work include research to enable the development of indicators for deepwater fish, and it is a concern though that the work to develop monitoring programmes for deep water fish and coastal fish is less advanced, as is the work to develop a regional scale survey for the Celtic Seas.

## **Descriptors 1 and 4: Marine Mammals: Cetaceans**

### ***Consultation Questions 1 and 2***

- We believe that the current UK marine monitoring of cetaceans does not meet the monitoring requirements for adequate implementation, management and enforcement of the MSFD and are surprised that no new monitoring is proposed. Further work is required to identify options for cost effective monitoring programmes. An ECJ ruling in 2005 (ECJ C-6/04) found that the UK was in breach of its duties to adequately survey its most biodiverse sites, let alone the condition of its wider seas.<sup>3</sup>
- However, we believe that current UK marine monitoring is adequate in those areas designated as Special Areas of Conservation for bottlenose dolphins (Moray Firth, Scotland and Cardigan Bay, Wales). Yet, limiting the surveying of coastal bottlenose dolphins to SACs falls far from an appropriate monitoring scheme for cetaceans with only three areas for one species being monitored. We would like further recommendations on how the UK Government intends to make monitoring of bottlenose dolphins representative of the UK area.
- It is particularly disappointing that for only one of the five most abundant species is any dedicated monitoring underway (bottlenose dolphins) and that this monitoring is purely in relation to its presence in marine SACs. Nothing specific is included in the proposed monitoring programme for the other four most abundant species (harbour porpoise, minke whale, white-beaked dolphin and fin whale) in UK waters. This is particularly disappointing considering the fin whale is listed as endangered. The European Commission started legal proceedings in 2005 against the UK and 7 other member states because of insufficient surveillance of cetacean populations.
- It is also disappointing that there is no monitoring proposed to progress the assessment of the status of the six further species (short-beaked common dolphin, Atlantic white-sided dolphin, Risso's dolphin, long-finned pilot whale, killer whale and sperm whale) for which the status is unknown due to a lack of suitable abundance estimates, particularly as some reports have identified that critical habitat exists in UK waters for both Risso's dolphin and the short-beaked common dolphin.<sup>4</sup> Monitoring is essential to establish baselines and trends and enable targets and indicators to be developed for such species.

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<sup>3</sup> Paragraph 67 of the ruling states: '*...the United Kingdom's argument that the list of surveillance activities carried out proves that surveillance is undertaken effectively cannot be upheld...*'

<sup>4</sup> J. Clark, S.J. Dolman, & E. Hoyt (2010) *Towards Marine Protected Areas for Cetaceans in Scotland, England and Wales*, WDGS.

- We also believe that there needs to be urgent attention given to address some major gaps in our knowledge of the status of cetacean populations in UK waters. Charting Progress 2 provides expert judgment assessments of the status of cetaceans at a UK regional basis and identifies that the status of cetaceans is unknown for two sub-regions – the Scottish Continental Shelf and the Atlantic North-West Approaches, yet it also recognises that the offshore waters north and west of Scotland along with the offshore waters to the south-west of England support the highest diversity of cetaceans in UK waters. Charting Progress 2 recognises that a better understanding of the abundance and distribution patterns of cetaceans including seasonal variation would be valuable. We consider that the status of cetaceans in the two sub-regions is a major gap in our knowledge which should be addressed within the proposed monitoring programme.
- We are very supportive of the UK stranding scheme (CSIP) that contains a valuable and long term data series that is vital to contribute understanding to the assessment of impacts in UK waters. Analysis of samples required to determine biological parameters to understand population dynamics and contaminant analysis should be covered in the CSIP's core funding.
- We are also supportive of the UK Bycatch monitoring scheme, although it does not go far enough to reduce, with a view to elimination, the bycatch of small cetaceans. Also, no efforts are currently underway to reduce the bycatch/entanglement of large cetaceans, despite more than 50% of stranded minke whales showing signs of entanglement and a further 17% of minke whales at sea also showing signs of entanglement (Northridge et al., 2010; Mathewson, 2012).
- The large-scale surveillance of cetacean population abundance through surveys like Small Cetaceans in the European Atlantic and North Seas (SCANS) is important to understand broad-scale trends in harbour porpoise populations across Europe. A well-resourced monitoring programme should include offshore, systematic SCANS-type surveys in addition to dedicated, strategic, high resolution and regionally representative surveys.
- The requirement for regionally representative surveys was highlighted by the European Court of Justice in 2007 where the Advocate-General opinion concluded that the cetacean monitoring programme in Ireland was 'ad hoc and confined to certain geographical areas'. All existing valuable field datasets are required (for example, Seawatch Foundation, Atlantic Research Coalition (ARC), NORCET (Northern North Sea *Cetacean* Ferry Surveys) and WDC) to achieve an adequate spatio-temporal understanding of population trends. In order to monitor GES adequately, all existing data are therefore required, especially where they can be used to assess habitat requirements.
- The consultation document itself identifies that 'the status of a further six species was unknown due to a lack of suitable abundance estimates'. These include populations regularly found in coastal waters, including Risso's dolphins and killer whales.
- As a result, it is unlikely that criteria/indicators 1.2/1.3 (population size/condition) and 4.1/4.3 (productivity/abundance/distribution of key trophic groups/species) are being met for the Risso's dolphin and killer whale.
- The UK MPA network will form an integral element of the UK's programme of measures for GES, meeting the Directive's requirements to put in place spatial

protection measures which contribute to a coherent and representative network of MPAs (MSFD consultation Part 1, Dec 2012). Identifying Natura sites for harbour porpoise, with the UK containing a significant proportion of wider European populations, is a critical component of this network. Work is currently underway to identify further SAC sites for bottlenose dolphin and harbour porpoise candidate sites. Likewise, monitoring of the Scottish MPA Network will be required once Search Locations have been progressed for minke whale, white-beaked and Risso's dolphin. These sites and other mobile species Marine Protected Areas for birds, seals, basking sharks and other cetaceans need to be advanced to achieve ecological coherence of the UK MPA network.

- Charting Progress 2 (CP2) provided the basis for the MSFD initial assessment. The limitations of CP2 were commented on by Wildlife and Countryside Link. It noted that knowledge of population trends was considered to be poor for cetaceans. The resulting MSFD consultation Part 1 (Dec 2012; page 19) found (emphasis added): 'Populations of whales and dolphins were severely affected by whaling before the international moratorium in 1980's, but have remained relatively stable in UK waters in recent years. The main anthropogenic pressure is the by-catch of cetaceans, especially dolphin and harbour porpoise, in commercial fisheries. **Overall assessments of cetacean status in UK seas are mainly of low confidence**, a classification of few or no problems only in the Northern North Sea and Southern North Sea where the assessments are of higher confidence'.
- The UK's Initial Assessment identifies a range of pressures on cetacean populations, and raises the problem of making direct links between individual pressures and impacts, but recognises that the cumulative impact of the range of pressures is a serious concern and may affect the long-term viability of some species. In addition, Charting Progress 2 identified a number of areas where further effort is needed to meet EU requirements, including the development of a strategic monitoring and surveillance programme, further monitoring of static-net fisheries where cetacean by-catch is greatest, information about the potential impacts of activities that generate noise, plus the possible synergistic effects of exposure to various environmental pollutants. Charting Progress 2 also identifies that while concentrations of some pollutants are clearly declining, the concentrations of chlorinated biphenyls in harbour porpoise blubber have declined only slowly despite controls on the use of polychlorinated biphenyls for thirty years. The current proposed monitoring programme addresses very little of this significant gap, and in light of the concern around cumulative impacts, we recommend that greater focus is placed on the investigation and monitoring of the cumulative impact of pressures, including those identified in Charting Progress 2, on cetacean populations.
- Given that a number of cetacean species have been proposed as Priority Marine Feature in the Scottish draft National Marine Plan, we also seek further clarity on how these species will be monitored, under MSFD or NMP.

#### ***Consultation Questions 3 and 4***

- Further information on the use and future of the Joint Cetacean Protocol would be useful. As would a transparent strategy for the inclusion of all other surveys, including government, industry and NGO programmes.
- Additional monitoring requirements are likely to include:

- Development of a comprehensive monitoring programme including offshore, systematic SCANS-type surveys in addition to dedicated, strategic, high resolution and regionally representative surveys;
- In order to monitor GES adequately, this monitoring programme should incorporate all existing data, including SCANS and smaller scale surveys of a variety of types, especially where they can be used to assess habitat requirements. It should also be designed such that it can monitor the individual and cumulative impact of the range of pressures on cetacean populations;
- Monitoring should include dedicated monitoring of the five most abundant species (bottlenose dolphin, harbour porpoise, minke whale, white-beaked dolphin and fin whale) as well as of the six further species whose status is unknown (short-beaked common dolphin, Atlantic white-sided dolphin, Risso's dolphin, long-finned pilot whale, killer whale and sperm whale). Such monitoring should be undertaken throughout their respective UK habitat ranges (i.e. within and outside protected areas and in coastal and offshore habitats);
- The UK bycatch monitoring scheme should be extended to include monitoring of the bycatch of large cetaceans, for example that of minke whales in creel fisheries, including for addressing MSFD descriptors on bycatch;
- The bycatch monitoring scheme should also have a renewed focus on monitoring the efficacy of existing mitigation, compliance rates, and informing the development of additional mitigation measures to reduce and ultimately eliminate bycatch. It should incorporate data from monitoring programs run by the various countries fishing within UK waters, such that the total impact of bycatch on populations can be estimated and should also include monitoring of bycatch for fishing vessels of 12 m length or less using electronic means; and
- MPA monitoring, like that already underway by Nature Conservation Statutory Agencies for bottlenose dolphin SACs, within further bottlenose dolphin and harbour porpoise SACs, as well as Scottish nature conservation MPAs for minke whales, white-beaked dolphins and Risso's dolphins, and any other cetacean MPAs that may be designated.

## **Descriptors 1 and 4: Marine Mammals: Seals**

### ***Consultation Questions 1 and 2***

- The proposed monitoring programmes for Descriptors 1 and 4 may be sufficient to meet requirements of the Directive for seals. However, the proposed monitoring programmes for this Descriptor will not be sufficient to guide progress towards the achievement of GES, where harbour seals were found to have an 'Unfavourable' status for FCS (Favourable Conservation Status) reporting under Article 17 of the EU Habitats Directive in 2013. Whilst MSFD consultation Part 1, Dec 2012 stated that it was 'not considered appropriate under GES to apply the FCS targets that are used under the Habitats Directive to all UK species and habitats', the dramatic declines of some harbour seal populations cannot be overlooked.

- The MSFD consultation Part 1 (Dec 2012; page 19) found (emphasis added): ‘Grey seals are generally experiencing few problems, but the reasons for **declines in some harbour seal populations on the East Coast of Scotland and in the Northern Isles, as well as the slow recovery of harbour seals from the most recent phocine distemper virus outbreak in the Southern North Sea**, need to be more fully understood’.
- A comprehensive seal monitoring programme has been in place for some time, resulting in good historical information on seal populations. The major concern with respect to seals is the recent significant declines in harbour seal populations in some areas, in particular the Shetland Islands, Orkney Islands, the outer Hebrides and the east coast of Scotland. The causes of the dramatic decline are not understood, though a number of factors are considered potentially relevant. The harbour seal monitoring programme focuses on the major haul-out sites at least once every five years, however in light of the recent declines in some areas monitoring has been enhanced,<sup>5</sup> and we recommend that the monitoring programme continues to be enhanced by monitoring harbour seals on a more regular basis which further investigation and reporting on the outcomes of investigation of the causes of the recent declines in population
- Criteria/indicators 1.2/1.3 (population size/condition) and 4.1/4.3 (Productivity/Abundance/distribution of key trophic groups/species) are not being met for harbour seals.

#### **Consultation Questions 3 and 4:**

- As harbour seal populations are in decline in some parts of the UK and overall, the FCS is ‘unfavourable’, additional monitoring to understand declines (page 31) are required. ‘Harbour seal monitoring occurs at each major haul-out site at least once every 5 years (grey seal summer distribution is included). The major grey seal breeding colonies are monitored at least once every two years’ (page 33). Five year monitoring is not sufficient for harbour seals considering the current unfavourable status of the population and the impact of corkscrew injuries.
- Regular beach monitoring in areas where corkscrew injury ‘hotspots’ have been identified (Orkney, Firth of Forth, Scotland; Blakeney Point, England) and elsewhere are required to provide a baseline and a more accurate understanding of scale of impact.
- Full commitment to post mortem seals is required in England and Wales, as is currently underway in Scotland, to enable a more accurate understanding of scale and location of corkscrew injuries, especially in harbour seals.
- However, most critically, immediate management efforts are required to improve the conservation status of harbour seals, and to enable GES to be met.

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<sup>5</sup> <http://www.smru.st-andrews.ac.uk/documents/678.pdf>

## **Descriptors 1 and 4: Birds**

### ***Consultation Question 1***

- We have examined the proposed monitoring programmes for the MSFD in relation to seabirds and waterbirds in conjunction with the recommendations of the Commission's Common Implementation Strategy recommendations for reporting on monitoring, which Member States also approved at the Marine Strategy Coordination Group (MSCG) in 2014.<sup>6</sup> This guidance states 'The reporting... needs to include information about what will be monitored, where, with what spatial resolution and temporal frequency, and with what methodologies' (Page 3).
- The consultation describes the main existing national monitoring programmes relating to seabirds and waterbirds, which are largely focused on breeding seabird colonies and wintering waterbird populations. We also support the integration of monitoring associated with the management of UK Marine Protected Areas (MPAs). However, given the wider range of species and functional groups identified as being necessary to monitor under the MSFD, the survey methodologies required to adequately monitor these species, and the wider range of MSFD criteria, we do not feel that these monitoring programmes are sufficient in their current form to meet the requirements of the MSFD and do not contain the necessary information to satisfy the reporting requirements under Article 11.
- Furthermore, it is unclear how these existing monitoring programmes could be modified in order to meet the requirements of MSFD monitoring. Some more detailed examples of their current shortcoming are:
  - The Wetland Bird Survey (WeBS) is unable to generate good quality trends for a high proportion of our important wintering populations of marine waterbirds, including all diver species, most seaducks and more offshore species such as Little Gull (an Annex 1 species for which we have no population estimate or trend).
  - This is largely due to poor coverage across the ranges of some species and an inappropriate survey methodology (ground-based counts). There is little WeBS alone can do about this, and a bespoke marine waterbird monitoring strategy is needed that incorporates WeBS data where appropriate and collects new data, including from aerial surveys, as required.
  - British Bird Survey (BBS) does not currently produce trends for any breeding marine waterbirds (e.g. Common Eider and Red-breasted Merganser) yet it is proposed as the only monitoring scheme for collecting data on these species. Whilst the methodology of BBS is appropriate, a large increase in volunteer surveyors would be needed for this scheme to collect sufficient data to monitor trends in these species, and this is unrealistic. A more achievable, professionally supported, means of monitoring the trends of breeding marine waterbirds is needed.
- Given that the targets are applicable to all species in all functional groups, for example, there is no detail on which species will be considered apart from kittiwakes, only that 'a range of key seabird and waterbird species' will be considered. Given the

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<sup>6</sup> [https://circabc.europa.eu/sd/a/b4d71a29-bdeb-4baf-bfed-e682b52513b1/MSCG\\_12-2014-02rev3\\_MSFDArt-11\\_ReportingPackage\\_AfterMSCG.doc](https://circabc.europa.eu/sd/a/b4d71a29-bdeb-4baf-bfed-e682b52513b1/MSCG_12-2014-02rev3_MSFDArt-11_ReportingPackage_AfterMSCG.doc)

degree of concern over the conservation status of some seabirds and marine waterbirds, including two species of seaduck listed as globally threatened by the IUCN (Velvet Scoter and Long-tailed Duck), we seek clarity on which species will be monitored and which methods will be used.

- There is little information on the level of regional coordination of monitoring programmes between the UK, other OSPAR countries and HELCOM. During this winter there was wreck of over 30,000 seabirds in the English Channel. No one knows the significance of this wreck or indeed the origin of the birds. To understand the effect of this wreck on European sea bird populations there is a need to ensure and support cross channel monitoring and research. For birds, the UK should commit to integrating the work of OSPAR's subgroup ICG-COBAM, which is developing common biodiversity indicators for the OSPAR area. The UK is leading the development of the subset of bird indicators. Further coordination with HELCOM is also necessary to ensure monitoring is carried out at the most meaningful scale for conservation.
- We strongly welcome the identification of the next major UK seabird breeding census, last conducted in 2000 (Seabird 2000), as contributing fundamentally to the monitoring of the MSFD. The successful completion of this survey, which provides the baseline for several species, is absolutely critical to the measurement of Good Environmental Status. The current status of this survey is not yet, however, clear.
- Climate change is thought to already be contributing to the declines of some species by encouraging a north-east shift in species distribution. Charting Progress 2 identified that 'there is strong evidence that climate-driven changes in the food chain have had acute negative impacts on seabirds', citing changes in the plankton communities of the North Sea having knock-on effects on larval fish and in particular sandeel productivity. It also recognises that fisheries may have contributed to a reduction in sandeels and cites an example where opening and closing a sandeel fishery clearly had an impact on the adult survival and breeding success of black-legged kittiwakes.
- Other pressures identified include changes in policies on discharging offal and undersize fish, removal of target and non-target species through fishing, contamination by hazardous substances, litter, visual disturbance, introduction of non-indigenous species and habitat loss. Monitoring of the seabird populations and assessment of the pressures to understand cause and effect is essential. The introduction of non-indigenous species is considered to be significant, and we welcome the development of an indicator on non-native or invasive mammals on islands supporting seabird colonies. It will however be necessary to enhance monitoring programmes, not just focused on the seabirds but also monitoring of non-indigenous species to address this pressure.
- We believe that monitoring must be enhanced to address data gaps and also to better understand the links between pressures and population status. For example, Charting Progress 2 recognises that sea bird assessment is necessarily limited by the available data, and that while the impact of climate change on seabirds is considered high, there is not, as yet, a clear link between the evidence and the results – although there is a strong correlation. In addition, it is recognised that further information is needed to determine:
  - the extent of impact of non-indigenous predators on island seabird colonies,

- how many seabirds die from entanglement in fishing nets or on long-lines both in UK waters and beyond,
  - the impact of habitat loss on both seabirds and waterbirds, particularly as habitat loss is expected to increase due to coastal squeeze, expansions in offshore renewable energy generation and defence/realignment, and
  - the cumulative impact of all activities and pressures.
- Charting Progress 2 recognises the importance of understanding better the interactions between climate, plankton, sandeels, fishing and seabirds, current monitoring is not sufficient to understand this. Strategic monitoring of seabird prey and provisioning would be required to understand this trophic relationship and how it is determining massive declines in some populations, and increases in others. Such monitoring will also help inform what recovery actions may be taken (i.e. by understanding alternative prey species) and therefore contribute to achieving GES (as well as obligations under the Wild Birds Directive).

### **Consultation Question 2**

- As stated in our answer to Question 1, we do not believe that the proposed monitoring programmes are adequate for measuring progress towards the achievement or otherwise of GES under the MSFD. This is particularly the case for targets for distribution within range, breeding colony failure invasive mammal presence on all seabird breeding islands, and for non-breeding birds, a number of which do not currently have basic population or trend estimates from the existing monitoring schemes proposed in the consultation. We therefore request more detail from Defra on how these programmes will be enhanced to measure the achievement or otherwise of GES for seabirds and waterbirds.
- Given that the targets on distribution and abundance rely on demonstrating that birds are “not significantly affected by human activities”, according to the UK’s own targets, clearer links are needed with monitoring programmes, for example, of marine planning and specific sectoral developments, such as offshore wind, wave and tidal power.
- It further needs to be stressed that the targets for seabirds and waterbirds are based on past baselines, which have not been made publically available. We request information on these baselines being used for birds as for other aspects of the MSFD.
- A gap analysis should be completed for the datasets proposed for monitoring, such as the Seabird Monitoring Programme (SMP) and Wetland Bird Survey (WeBS). Both have limitations in spatial coverage which are likely to hinder measurement of GES without addressing these limitations. The WeBS dataset, for example, has limited non-estuarine coverage, given that the MSFD does not include estuarine waters. We do, however, strongly support the integration of estuarine monitoring into both MSFD and WFD monitoring programmes.
- Emerging seabird tracking data is showing that information on range is either incomplete (missing hotspots) or underestimates previous maximum foraging distance estimates by up to a factor of 3 for some species. The results of this tracking

work, such as from the RSPB's portfolio of seabird tracking work, should be used in combination with other datasets, such as the European Seabirds at Sea database. Further, there are a number of other marine waterbirds, including Long-tailed Duck and Common Scoter, about which we have very little information on flyway delineation and movements. The lack of this information impacts their effective conservation.

- We support the work, led by JNCC, to assess the risks of seabird bycatch in UK waters, in order to support the development of the seabird bycatch indicator in the next MSFD cycle, as well as helping to implement the EU Seabird Plan of Action.
- We do not agree, however, that the current monitoring of invasive mammals at key seabird island colonies, is sufficient to achieve GES, and believe that a more strategic and widespread programme should be developed, including for islands where seabirds have been previously eradicated but which have restoration potential.

### **Consultation Question 3**

- Urgent baseline monitoring is needed particularly on the distribution of breeding seabirds and non-breeding seabirds and waterbirds at sea. For the latter category, we are not aware of any new initiatives being proposed, despite the current lack of effective monitoring for many of these species. For the former, seabird tracking work should be integrated as fully as possible into the existing European Seabirds at Sea (ESAS) database. ESAS remains one of the most comprehensive and important data sets on seabird distribution, which is a major strength. It was, however, traditionally collected on an ad-hoc basis, which means that there are significant spatial and temporal gaps, including large areas of sea that have never been surveyed, and the dataset is also relatively old.
- Regular tracking data such as that provided by the Future of the Atlantic Marine Environment (FAME) project provides the greatest detail on seabird foraging distributions during the breeding season. These datasets are also highlighting important hotspot areas, supporting and in several cases adding to the information supplied by the ESAS database. Effective groundtruthing and integration of both ESAS and FAME tracking work is needed to develop a fit-for-purpose offshore dataset capable of demonstrating whether targets on distributional pattern with range have been met.
- Monitoring associated with offshore activities, such as offshore wind, often provides best available evidence for bird distributions in these areas. The data from such monitoring, in particular post-construction operational monitoring, should be made available to assist with monitoring of at-sea distributions.
- Links must also be made to the Marine Evidence Group set up to analyse key evidence gaps associated with the implementation of the EU Habitats and Birds Directives.
- Finally, a more systematic programme of monitoring of invasive mammals at seabird islands must be carried out, not just where action is already being taken but where seabirds have been previously eradicated by mammal predation.

#### **Consultation Question 4**

Other relevant datasets which should be used in combination with the previously-identified monitoring programmes include:

- At-sea tern distribution data (JNCC) - Tern at-sea distribution data collected by tracking terns in boats around existing SPA tern colonies during the breeding season to inform decisions on possible marine SPAs for terns, as ESAS and aerial survey data are generally poorer for detecting specific species in inshore areas (which are used by terns).
- Waterbird inshore surveys - Surveys of inshore waterbirds (primarily seaducks, divers and grebes) have taken place since the winter of 2000/01, primarily using aerial surveys. However, these data are currently being further analysed as part of work progressing the identification of inshore SPAs for non-breeding aggregations of marine waterbirds. They represent the most suitable method for long-term monitoring of waterbirds at sea and should therefore be continued.
- Coastal seawatch data - Local bird groups conducting monitoring in their areas are present across the UK. Some of the information collected by these groups will feed into the WeBS data but this data is also valuable in its own right for passage counts collected from coastal seawatches. This type of survey picks up the movement of seabirds on passage including species that breed in other parts of the UK or abroad. Some bird groups also produce annual reports including bird counts at particular locations. Reports available from <http://www.seawatch-sw.org/>

#### **Descriptors 1 and 4: Turtles**

- The UK's Initial Assessment identifies that four species of turtle are occasionally reported from UK waters, with the vulnerable leatherback turtle being the most commonly sighted and the only turtle regarded as a true member of British fauna. Some areas, such as Carmarthen Bay and Tremadog Bay are regarded as foraging grounds. According to the UK's Initial Assessment, the magnitude of key pressures, current status and trends, conservation status and predicted status cannot be assessed as existing data is too sparse. However, it recognises that leatherback turtles were listed as critically endangered globally and that there is a need to collect data internationally around the western approaches to the European Shelf i.e. Celtic Seas and Bay of Biscay regions. Three lines of high priority research are identified - genetic and tagging studies to establish migratory patterns, analyses of bycatch data and monitoring. However, the proposed monitoring programme does not propose any monitoring with respect to marine turtles.
- Given the rarity of sightings in UK waters we recommend that a cost-effective approach would be to use existing survey programmes for other species and other platforms of opportunity to help monitor turtle populations. Monitoring could include, but should not be limited to, sightings and strandings data collected in conjunction with fisheries and marine mammal monitoring programmes. Information should be collected on rates of bycatch in different fisheries (and in particular inshore pot fisheries and pelagic long-line fisheries) and rates of debris ingestion, as well as distribution and abundance data. Consideration should also be given to genetics and tagging studies, identified as a priority area of research in Charting Progress 2.

- Turtle sightings and strandings are currently monitored through a public sightings scheme run by Marine Environmental Monitoring [www.strandings.com](http://www.strandings.com)

### **Descriptors 1, 4 and 6: Pelagic Habitats**

- We believe that the current status of pelagic habitats and the status of plankton as a whole needs to be clarified. While plankton as a whole might be considered healthy and subject to few direct human pressures, this is not the same as the status of pelagic habitats. There is a considerable danger in this assumption, as the climatic (sea warming), and chemical (ocean acidification) processes occurring now in the NE Atlantic are of huge concern.<sup>7</sup> It is important to recognise that there is evidence of significant change in the composition, abundance and spatial and temporal abundance of both phytoplankton or zooplankton. Indeed, the UK's Initial Assessment refers to the overall assessment of the plankton community as experiencing "some problems" in both subregions. It explains that changes have been observed in plankton communities as a result of rising sea temperatures, and changes include a large increase in phytoplankton biomass over the past two decades in some areas, many phytoplankton species groups blooming earlier in the year resulting in them being out of phase with zooplankton and fish larvae that rely on them for food, and a progressive shift northward in warmer water zooplankton and a retreat to the north of colder waters species over the past 50 years.
- The UK's Initial Assessment points out that it is still unclear to what extent natural variability and pressures, including climate change, ocean acidification and cascading effects from fishing, may be influencing the changes seen in plankton distributions and plankton communities. Monitoring will be essential to better understand the current status and trends and to begin to understand the relative impact of each of the pressures identified.
- We are therefore very disappointed that other components of the pelagic ecosystem, including octopus, squid and cuttlefish, microbial communities, and pelagic fish species, particularly those not targeted by commercial fisheries, have not been addressed.

### ***Consultation Question 1***

- The report Charting Progress 2 (<http://chartingprogress.defra.gov.uk/>) classified the status of plankton around the UK as 'Unacceptable', with a 'High' level of confidence and a 'Deteriorating' trend. The reason that the assessment for plankton for MSFD is healthy and currently fulfilling the requirements for GES is that MSFD scopes out climate change and carbon dioxide, requiring only that (Descriptor 1): 'Biological diversity is maintained. The quality and occurrence of habitats and the distribution and abundance of species are **in line with prevailing** physiographic, geographic and **climatic conditions**'.
- The proposed monitoring programme appears to be incomplete. Section 3: Gaps and issues states that there are gaps in current monitoring and that work is underway to present options to address these gaps. It is not clear whether the additional monitoring options decided upon will then be presented for consultation. For this reason we do not consider that the proposed monitoring programme for pelagic habitats yet meets the requirements of the Directive.

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<sup>7</sup> Hoegh Guldberg *et al.*, (2010) *The impact of climate change on the world's marine ecosystems*, Science 328

- The discussion of the network of fixed sampling stations refers to a network of ‘up to 15’ fixed sampling points with sampling at ‘regular intervals throughout the year’. More detail of station numbers, positions, what constitutes a regular interval (hourly, daily, weekly, monthly, etc.), and what other environmental variables are measured would be required to judge whether this monitoring was sufficient. For example, has the lack of a fixed station in the Irish Sea, noted in Charting Progress 2, been addressed?

### **Consultation Question 2**

- Charting Progress 2 considers that GES is currently being achieved for the pelagic habitat (plankton). For the same reasons as above – acknowledged incompleteness of the proposed monitoring programme, and insufficient detail available on the current monitoring – we do not consider the proposed monitoring programme to be sufficient to help maintain GES for pelagic habitats.

### **Consultation Question 3**

- The summary of proposed monitoring for pelagic habitat acknowledges that the monitoring described is incomplete, with further research being undertaken to address the gaps. It is important that as well as filling the gaps listed in plankton data, simultaneous data on hydrographic variables, chemistry and nutrient concentrations are collected. Without these it becomes very difficult to identify cause and effect for any observed change in plankton distribution.
- Even though variability related to climate change, carbon dioxide concentrations and ocean acidification are not considered within MSFD and GES, these are the primary drivers of change in the plankton distributions in our seas. These changes in plankton distribution are fundamental to the entire marine food web. It is vital that monitoring is designed to provide sufficient information to try to attribute changes to natural variability, climate change, or other anthropogenic causes.

### **Consultation Question 4**

- As well as being fundamental to the global climate system and the marine food web, plankton are highly sensitive indicators of environmental change, possibly more sensitive than the environmental variables themselves, amplifying weak signals. In this context it is thought to be<sup>8</sup> important to monitor phytoplankton species, phytoplankton functional types, zooplankton species, phenology and chlorophyll.
- There should be some mention of the role of satellite data in the monitoring programme. Reliable measurements of chlorophyll can be made in all except mixed coastal waters, and progress is being made in the measurement of plankton functional groups from satellite (Charting Progress 2).
- As plankton play a fundamental role in the marine food web, the summary of the monitoring programme should explain how monitoring pelagic habitat can contribute to the achievement of GES for other species and habitats.

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<sup>8</sup> Hardman-Mountford, N. and J. Huthnance (2006) *The development of useful indicators for Marine Processes & Climate (MPC) and Underwater Sound*, UK Inter-Agency Committee on Marine Science and Technology.

## **Descriptors 1, 4 and 6: Benthic Habitats**

- We welcome the proposal that new monitoring will be instigated for benthic habitats to complement existing monitoring, although the new monitoring will only be made operational between 2014 and 2018.
- The UK's Initial Assessment, based on the conclusions of Charting Progress 2, identifies that impacts on seabed habitats are widespread and that the composition of seabed habitats has been altered over large areas. Also that sediment habitats are generally more degraded than rocky habitats and subtidal habitats close to shore are generally impacted by a greater variety of pressures than habitats further offshore. The main causes of damage and degradation differ between the intertidal zone and the subtidal zone. Loss of habitat, hydrological changes and, to a lesser extent, pollution and nutrient enrichment have been identified as the main causes of damage and degradation in the intertidal zone, while demersal and benthic-towed fishing gear are considered the main cause of damage and degradation in subtidal habitats. Charting Progress 2's assessment of the six broad-scale habitats concluded that:
  - intertidal rock is generally in a good condition,
  - human pressures have adversely affected moderate to large areas of intertidal sediments, particularly mudflats and saltmarshes, in most regions,
  - large areas of both shallow subtidal sediments and shelf subtidal sediments have been impacted by mobile fishing gear,
  - limited areas of subtidal rock habitats have been impacted by human activity – although some are permanently damaged or have been removed by mobile fishing gear, and
  - in some regions large areas of deep-sea habitats have been similarly affected by mobile fishing gear.
- The proposed monitoring programme is likely to effectively cover the intertidal habitats and some of the sub-tidal habitats, particularly sea grass beds. We believe it is important that effective monitoring of other shallow subtidal and shelf subtidal sediments, subtidal rock and deep-sea habitats must be addressed quickly, particularly as some of these habitats have experienced some of the most extensive damage.
- The Charting Progress 2 Feeder Report anticipates that further localised losses and modifications of some habitats will occur in the future as a result of development for renewable energy (wind, wave and tidal) and container port facilities and marinas at the coast. In addition, while the intensity of pressure is anticipated to remain relatively stable for the next one to two decades, it is not clear what additional pressure will result from climate change, e.g. establishment and range extension of non-native species, coastal squeeze as sea levels rise, along with changes in seawater salinity and temperature. In addition, in light of recent tidal surges and flooding, changes in weather patterns should be considered, particularly for intertidal habitats. Moreover, it is not clear how the intensity and distribution of some activities, such as bottom trawling and aggregate dredging, will change in the future. The ability to monitor vessels using bottom towed fishing gear is there (with the application of mobile phone technology VMS), and this can be used in a UK-wide context to provide much

more quantitative data on cause and effect of different intensity of fishing in different areas. Current VMS use and application on vessels >12m is poor, as data resolution is coarse (one position fix every two hours). This is at a scale that is unsuitable for the scientific understanding of effect of bottom towed fishing on benthic communities.

- Conversely the UK's Initial Assessment favours the possibility of the status of seabed habitats remaining stable or improving slightly as demersal fishing activity is predicted to decrease in spatial extent between 2010 – 2020, though it will be dependent on recovery rates, and many other environmental variables. This is an assumption, rather than a predictable trend. Indeed, it is possible that effort (of fishing) is not the major altering impact on benthic ecosystems, but a single impact. (i.e. speculative trawling over a pristine ground at low effort) can have the same impact as intensive use. Only high frequency vessel positioning data alongside detailed seabed biophysical assessment will provide this essential information. The Assessment also recognises that the development of tidal range devices may result in significant impacts on intertidal habitats along with coastal squeeze and that there are potential effects on biogenic habitats resulting from ocean acidification.
- The Scottish Marine Atlas shows some or many concerns, and condition declining for all benthic habitats apart from sub and intertidal rock.
- Predicting future trends is difficult under any circumstances and further complicated by the changing climate in which status and trend assessments have been or are being undertaken. We believe that comprehensive monitoring programmes will be critical to the further understanding of the current status and trends for seabed habitats and to assess pressures and measure progress towards GES. Implementation of current monitoring and the development of further monitoring must take into account the following pressures identified in the Charting Progress 2 Feeder Report:
  - the pressure on intertidal sediments due to rising sea levels and immobile coastal defence structures which could cause habitat loss over large areas;
  - reductions in structural complexity and diversity for subtidal rock, boulder and cobble habitats impacted by mobile fishing gear;
  - impact on the structure and function of shallow subtidal habitats and shelf subtidal sediments as a result of the impact of fishing gears (trawling and scallop dredging, demersal fishing); and
  - physical disturbance to deep sea sediments and damage to deep sea fragile seabed communities.

## **Descriptor 2: Non-Indigenous Species**

### ***Consultation Question 1***

- We do not think that the proposed monitoring programmes for this Descriptor are sufficient to meet requirements of the Directives. Although we acknowledge the lack of data available for invasive non-native species (INNS) in the UK and note that this is highly restrictive for planning and implementing appropriate monitoring

programmes we believe that a number of proposals could be made from current expertise and experience from other countries. Our recommendations are laid out in more detail below.

- We encourage a wider precautionary approach: while high risk areas should be prioritised in terms of monitoring to identify the introduction and potential establishment and spread of INNS, medium and low risk species and areas should not be overlooked in order to avoid INNS going unnoticed until they reach a nuisance level. Effective and continuous horizon-scanning is essential to developing accurate and up-to-date data on occurrences and trends in INNS at local, national and international levels.
- The proposed monitoring in harbours and marinas, which are high risk areas for the introduction of INNS, is crucial and will require the cooperation and vigilance of boat users, port authorities and national environment agencies to detect occurrences of invasive INNS.
- We welcome the pathways project early warning system in Wales and would recommend that this is assessed over time and if successful rolled out more widely as part of the monitoring process.
- The proposal in Northern Ireland is to predominantly use the Northern Ireland marina and harbour survey to look at abundance, distribution and occurrence of INNS. Australia has in place a monitoring system which has identified the importance of monitoring target locations on a six monthly basis. We therefore suggest that monitoring marinas and harbours every three years will not be sufficient for early detection or spread of INNS. In addition various species will be more likely to be detected at different times of year at different lifecycle stages and this will be difficult to capture when monitoring on such a long timescale.

### **Consultation Question 2**

- We do not believe that the proposed monitoring programmes for this Descriptor are sufficient to guide progress towards the achievement of GES and the related targets. Although we acknowledge the difficulties in proposing a robust monitoring programme as a result of an information deficit on the occurrence and spread of INNS in the UK we believe that there are improvements to be made.
- The monitoring proposals predominantly look at abundance and distribution of INNS. We suggest that in order to meet target 2.2.2 monitoring needs to also look at the impact of INNS on wider habitat and biodiversity rather than being non-native species specific.
- We note that the only specified pathway for the introduction of INNS that is outlined for monitoring is harbours/ports/marinas. This is not simply one pathway and we would like a commitment to monitoring of both ballast and hull fouling as important pathways. We would like to highlight that there should also be scope for the expansion of monitoring to take into account less direct pathways of introduction, such as on marine debris (see Barnes, D. K. A., (2002)<sup>9</sup>), due to shifting environmental conditions as a result of climate change (e.g. changes to planktonic distributions and other drifting species, such as Japanese wireweed, *Sargassum*

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<sup>9</sup> Barnes D. K. A. (2002) *Invasions by marine life on plastic debris*. Nature p.416, 808–809.

*muticum*) or as a result of other anthropogenic activities (e.g. escape of non-native fish or spread of disease from aquaculture operations).

- We would like to seek clarification/expansion on the proposed monitoring outlines in Section 2(ii). What are the current implemented measures for mitigating the impact of INNS, and how will monitoring/baseline data collection be tailored to them specifically to determine their effectiveness? It is not clear from the consultation how the monitoring will feed into delivering the targets such as the production of action plans.
- We highlight again the importance of a horizon scanning mechanism to identify new and potentially dangerous INNS and a process to trigger and inform emergency response arrangements. Without horizon scanning we do not believe the target on reducing the risk of introduction and spread of non-native species can be met. Monitoring designs should have the capacity to detect and identify non-target species that show invasive characteristics. The Australian monitoring guidelines highlight such characteristics as being: a tendency towards monoculture or high local abundance, association with degraded habitats, sudden appearance in a monitoring location, strong association with artificial substrate and a rapid increase in abundance.<sup>10</sup>
- Any monitoring system needs to be regularly reviewed and adapted as necessary to accommodate for adaptations and new species. It needs to be adequately resourced and we also recommend a monitoring report.
- We believe it is important to time monitoring to specific lifecycles stages of INNS and to maximise likelihood of detection. We believe it is also important to access relevant expertise as some species can be very difficult to identify. For example, a system of collecting samples of unknown species (or photographs where they provide enough information) to be sent for verification to the most relevant taxonomist. The monitoring system in Australia requires every target species to be verified by a taxonomic expert not just new species.

### **Consultation Question 3**

- The MSFD Descriptor 2 requires that 'INNS introduced by human activities are at levels that do not adversely alter the ecosystem'. Data on INNS collected for the monitoring programme will need to be regularly and stringently analysed in order to anticipate whether the population level of an INNS will begin to adversely affect the ecosystem well in advance of this eventuality, so that the impacts can be properly mitigated at a stage when it is more manageable. A strategic and proactive approach to monitoring and surveillance is needed so that the information gathered supports the target to achieve GES in an efficient and cost-effective way. The data requirements for robust monitoring include:
  - Tracking distributions of key marine INNS already present in UK MSFD regions; this will require regular sampling, particularly of highly fecund and fast-growing species in order to accurately monitor the potential risk and spread/containment.

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<sup>10</sup> [http://www.marinepests.gov.au/marine\\_pests/publications/Documents/Monitoring\\_Manual-lowres.pdf](http://www.marinepests.gov.au/marine_pests/publications/Documents/Monitoring_Manual-lowres.pdf)

- Vigilance for species that have not yet arrived in the UK; this will necessitate join up across MSFD regions to enable mutual preventative monitoring for the UK and other member states.
- Mapping and evaluating the impacts of INNS on native species and the wider ecosystem.
- We believe that this descriptor needs to align with the invasive species proposals under the birds descriptors. It is very important that monitoring programmes include proposals to monitor marine pathways that impact on island invasions. We support the proposals under the birds descriptors on monitoring proposals for island INNS.

**Consultation Question 4:**

We recommend that the following suggestions should be considered and included as part of the Descriptor 2 INNS monitoring programmes:

- Increase public involvement in monitoring of INNS (education and awareness raising to encourage public to report sightings) and maintain long term funding/resources for local action groups.
- Utilise advances in technology that facilitate public involvement (e.g. provision to record sightings of INNS online or using mobile phone apps).
- Further engagement with the academic community to ensure their research agendas contribute to information gaps regarding INNS, particularly with respect to preventative monitoring. Scientific reporting on such issues is improving through dedicated publications, such as the *Aquatic Invasions* journal.
- Work with the catchment based approach and water framework directive delivery to monitor estuaries and transition habitats.
- Monitoring measures collect oceanographic data at target locations. This data will assist in identifying species that can survive at those locations.
- Use a range of observation systems to identify species across a range of marine habitats e.g. core samples, grab samples, settlement plates, traps to name just a few.
- A species that is confirmed as no longer present should continue to be included in the ongoing monitoring to validate its 'absence' status and to allow monitoring to continue in case the species re-establishes in the future.
- Australia has established detailed baseline data and an ongoing monitoring programme for detecting marine invasive non-native species. New Zealand carries out port biological baseline surveys based on protocols developed in Australia by the Commonwealth Scientific and Industrial Research Organisation (CSIRO) Centre for Research and Introduced Marine Pests (CRIMP) for port surveys of INNS which have been used in more than 15 countries worldwide. They are intended to provide a baseline for monitoring the rate of new incursions by marine INNS in port environments.<sup>11</sup> We believe it would be valuable to learn from the experience of

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<sup>11</sup> <http://www.marinebiosecurity.org.nz>

Australia and New Zealand to help inform the monitoring measures and achieving GES and the targets for this descriptor. Australia targets monitoring at species most likely to have a significant impact at locations most likely to be invaded. Australia found that 17 locations accounted for 80% of the risk factors assessed but also acknowledged the importance of monitoring in high value locations. Australia's monitoring guidelines detail how they determined high risk locations and target species.<sup>12</sup>

### **Descriptor 3: Commercially Exploited Fish and Shellfish**

#### ***Consultation Question 1***

- There are fewer concerns over the use of existing monitoring programmes for this descriptor as basing the monitoring programme on the ICES stock assessments and mechanisms is the only practical approach considering the shared nature of the North East Atlantic fishing, the CFP and the need for international coordination, cooperation and comparability of indicators under this descriptor for shared stocks.
- **With regards to 'Populations of all commercially exploited fish and shellfish are within safe biological limits'**: It is some reassurance that as a result of better implementation of management measures, fishing pressure has been decreasing in EU waters and especially in the North East Atlantic since 2007. Commission statistics show that for EU waters, the number of assessed stocks fished too heavily and above their maximum sustainable yield (MSY) level has fallen from 94 % in 2007 to 39 % in 2013. Furthermore in 2013, 59 % of those assessed stocks had climbed back to safe biological limits.
- Although these figures look encouraging, this improvement in the status of stocks is still only relevant for a fraction of the exploited (and very few of the nonexploited) fish species killed through fishing. Currently, approximately 50 % of all landings from stocks in the EU Atlantic waters come from data-poor stocks. The ICES assessment coverage is not complete and the UK needs to continue to request ICES increase the breadth of assessment considering that many commercial species are data poor.
- The use of proxies for MSY may be acceptable in the short term whilst new studies and research is undertaken to provide data to assess data poor stocks but in the longer term allowing the continuance of data poor species within the commercial harvest is unacceptable both for the revised CFP targets and in having a high degree of confidence in achieving GES for this descriptor. To this end we would have expected to see an indication of commitment to gathering more data at the national level as it would appear inevitable that this will be needed.
- **Still significant gaps in the level of knowledge which need stating and addressing**: In the UK's initial assessment for MSFD under this descriptor the UK report states that the numbers imply that around half of the stocks in UK waters will need to improve to achieve GES, but that the status of a third of all commercial finfish stocks in UK waters are currently not quantitatively assessed. This means that we still know too little about many of the stocks and how much their future reproductive capacity is being threatened, this level of knowledge about our fish stocks is far from ideal.

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<sup>12</sup> [http://www.marinepests.gov.au/marine\\_pests/publications/Documents/Monitoring\\_Guidelines-lowres.pdf](http://www.marinepests.gov.au/marine_pests/publications/Documents/Monitoring_Guidelines-lowres.pdf)

- It is notable that in the consultation proposal, the proportion of assessed and unassessed stocks is not reported under Status of Commercial Fish and Shellfish in UK seas. We consider that in charting progress towards GES, it is important to understand what proportion of all fished stocks are assessed as meeting GES not just what proportion of the assessed stocks. Monitoring this proportion over time will give information on the adequacy of the monitoring and lead to greater confidence in the resulting GES indications produced for this Descriptor.
- The situation is similarly worrying with respect to commercial shellfish where a number of species such as scallops, winkles, bivalves, some crabs and crayfish are not being fully assessed. Fisheries for these species include some of the most (potting) and least (scallop dredging) sustainable fishing methods and consequent environmental pressures. These fisheries, the environmental pressures they exert and therefore their management, have major implications for both this and other MSFD Descriptors and the prospect of achieving GES. In addition many are vital for the long term future of small-scale local inshore fishermen.
- We are pleased to see that an ICES scallop working group is being formed with the remit to provide the scientific support for scallop assessment methods, we look forward to these being incorporated into the UK's monitoring of this Descriptor. We are encouraged that the UK is also exploring whether additional species should be considered in the context of this work.
- With the introduction of the revised Common Fisheries Policy and with the new Multi Annual Data Collection Plan (DC-MAP) we expect to see revisions that echo the changed emphasis in European fisheries management towards a higher level of stock health and sustainability and decreasing the impact of fishing on associated habitats and species. Increased emphasis on monitoring in these areas that will be required should support the monitoring of progress towards targets for GES for this descriptor.
- **With regard to 'exhibiting a population age and size distribution that is indicative of a healthy stock':** Currently the UK does not provide targets and indicators for these elements under Criterion 3.3, as there is considerable debate over how these relate to exploited stocks and whether they are relevant to exploited stocks. We note that many other sub region Member States have included some coverage of this criterion and ICES recommended working towards developing an approach to this.
- We are not convinced that achieving 'safe biological limits' will invariably result in a 'healthy' age and size distribution as a stock within safe biological conditions does not represent a stock under no fisheries based selection pressure. Also sporadic recruitment events can dramatically distort the age and size distribution whilst appearing from MSY indicators to be a stock within safe biological limits.

## **Descriptor 7: Hydrographical Conditions**

### ***Consultation Question 1***

- The initial assessment of the status of hydrographical conditions in UK seas of '...no significant broad scale alterations of hydrographic conditions affecting ecosystems...' excludes alterations associated with climate change and CO<sub>2</sub> as they are out of the scope of MSFD and GES. However, hydrographical conditions around the UK are

undergoing significant large-scale changes associated with climate change, such as warming, sea level rise and acidification. It is important to monitor these changes in order to identify other adverse anthropogenic effects.

- The monitoring programme proposed relies on the regulatory and licensing framework and the continuation of current monitoring and modelling of hydrographic conditions.
- The Charting Progress 2 report identified gaps in the monitoring and modelling of hydrographic conditions around the UK. To a large extent modelling allows us to fill the gaps between hydrographic data, however, data for many hydrographic variables remains too sparse to reliably constrain the models. For example, while ARGO floats provide good subsurface data offshore, subsurface data is sparse on the shelf, and salinity data is sparse everywhere. Baseline bathymetry data is also sparse, particularly in the shallower regions with more mobile sediments. As all the GES Descriptors rely to a certain extent on maintaining favourable hydrographic conditions, more information on how the monitoring programme will address these known gaps is required.
- The focus on the large-scale in the monitoring programme is presumably driven by costs. Descriptor 7 makes no mention of scale. Benthic habitats in particular can be small-scale and reliant on small-scale local hydrographic conditions to deliver food and nutrients. These conditions could be vulnerable to disruption by small-scale developments.
- Whether the monitoring programme is sufficient to meet the requirements of the Directive may depend crucially on how the currently vague concepts of 'potential large-scale hydrographic changes' (Section 2(i)) and 'large enough to have the potential to alter hydrographic conditions...' (Section 2(iii)) are applied.

### ***Consultation Question 2***

- It appears that hydrographical conditions around the UK are considered to be achieving GES (ignoring changes due to climate change).
- As in Question 1, the focus on the large scale in the proposed monitoring programme risks failing to help maintain this GES and meet the related targets. GES Descriptor 7 makes no mention of spatial scales and the targets refer to '...potential impacts, including cumulative effects **at the most appropriate spatial scales...**'. The most appropriate spatial scale will not always be the broad scale. As such there is a risk that the monitoring programme will not be sufficient to guide progress towards the achievement of GES and the related targets.

### ***Consultation Question 3***

- The major concern is over the identification of potential adverse effects on scales which are perhaps not broad scale but which are still significant for marine, and particularly benthic, ecosystems. These should be identified, tracked and recorded in the same way as the licensing of large-scale developments to confirm whether there is a need for additional monitoring.

#### **Consultation Question 4**

- The monitoring programme should begin to address the knowledge gaps identified in Charting Progress 2.
- Monitoring programmes for all the other Descriptors are to some extent reliant on monitoring of the hydrographic conditions, sometimes broad scale and sometimes local. This interaction needs to be made explicit in the hydrographic monitoring programme.

#### **Descriptor 9: Contaminants in Fish and Seafood**

##### **Consultation Question 1**

- We acknowledge the current deficit in data that is available on contaminants in fish and other seafood and agree that a more robust set of baseline data should be collected as a starting point. Most hazardous substances have been found to be below detection limits and/or safe biological limits, and data have shown recent decreases in concentration in some sediment contamination levels.<sup>13 14</sup> Therefore, with low or no imminent health risk, we are generally satisfied that the proposed monitoring is currently adequate to meet the requirements of the Directive.
- However, the proposed monitoring programme fails to take into account the effect of aquaculture activities and the fact that contaminants can also enter the food chain through these activities. Not only have fish from fish farms been found to have higher concentrations of contaminants than wild fish, but contaminants also build up locally within the sediment around sea cages and may have a detrimental effect on local biota (which may also enter the food chain). The Marine Atlas<sup>15</sup> shows localised increases in the input of copper and zinc from fish farms in Scotland (P042), and therefore, we would like to highlight the need for the monitoring programmes to be adaptable according to risk areas, such as aquaculture operations. The Scottish Government has set ambitious targets for increasing aquaculture output (210,000 tonnes, plus 100% increase in shellfisheries by 2020), therefore the monitoring programme for this descriptor should be able to take this into account when measuring any resultant changes to contaminants in food chain.
- The proposed monitoring programme for this Descriptor does not provide information on the frequency with which assessments will be made and indicates that the focus will be on collecting baseline data at commercial fishing hotspots. We encourage further development of the monitoring programmes to collect contaminant data from a wider geographical range that encompasses as many commercial fishing grounds as possible and take into account temporal changes in order to maximise information and potential achievement of GES. However, monitoring should include scoping to identify areas that have not previously been focused upon and further research to take into account more recent work.

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<sup>13</sup> Baxter, J.M., Boyd, I.L., Donald, A.E., Malcolm, S.J., Miles, H., Miller, B., Moffat, C.F., (Editors) (2011) *Scotland's Marine Atlas: Information for the national marine plan*, Marine Scotland, Edinburgh. Pp. 191

<sup>14</sup> UK Marine Monitoring and Assessment Strategy (2010). Charting Progress 2 Healthy and Biological Diverse Seas Feeder report. (Eds. Frost, M. & Hawkridge, J). Published by Department for Environment Food and Rural Affairs on behalf of UKMMAS. 682pp.

<sup>15</sup> Baxter, J.M., Boyd, I.L., Donald, A.E., Malcolm, S.J., Miles, H., Miller, B., Moffat, C.F., (Editors) (2011) *Scotland's Marine Atlas: Information for the national marine plan*, Marine Scotland, Edinburgh. Pp. 191

### **Consultation Question 2**

- We agree that the proposed monitoring is sufficient to guide progress towards the achievement of GES in terms of commercial fisheries as current data indicates that contaminants in fish and other seafood are generally within safe biological limits. However, as stated in Question 1, the proposed monitoring does not take into account contaminants entering the food chain/ecosystems through aquaculture and suggests that this should be considered as part of the programme to provide a more complete picture of the potential issues.

### **Consultation Question 3**

- We suggest that the proposed monitoring should be expanded to include routine sampling of contaminants in fish and surrounding sediments from fish farms and other aquaculture operations in Scotland [and the wider UK] (see Q2). Additionally, allowance should also be made for the proposed monitoring programme to be easily adaptable to include collecting baseline data at specific sites where marine developments are planned (e.g. aquaculture operations, renewables consents) to allow the early detection of potential increases in contaminant levels during and after development.

### **Consultation Question 4**

- We suggest the following for consideration, which would help to enhance the proposed monitoring programme for this Descriptor:
  - Further engagement with the academic community to ensure their research agendas contribute to information gaps on contaminants in fish and seafood.
  - Engagement with the aquaculture industry to increase the efficiency of monitoring around aquaculture operations where concentrations of contaminants in the sediments and biota are known to be higher.
  - Cooperation with retailers of fresh fish and seafood to ensure that products are stringently and routinely checked prior to being made available to consumers. This should also include small-scale outlets, such as markets, where fish and seafood may be sourced directly from fishing boats.

## **Descriptor 10: Marine Litter**

### **Consultation Question 1**

- The proposed monitoring programmes are partially sufficient to meet the requirements of the directive. In general we would recommend using the two advice documents produced by the MSFD Technical Subgroup (TSG) on Marine Litter<sup>16</sup> to ensure that a consistent approach is used both within the UK and regionally.

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<sup>16</sup> MSFD GES Technical Subgroup on Marine Litter (2011) *Marine Litter - Technical Recommendations for the Implementation of MSFD Requirements*, EUR 25009 EN– Joint Research Centre – Institute for Environment and Sustainability. MSFD GES Technical Subgroup on Marine Litter (2013) *Guidance on Monitoring of Marine Litter in European Seas*, JRC Scientific and Policy Reports.

- **Beach litter:** The MCS Beachwatch data is probably the most extensive beach litter dataset in the UK and is well suited for use as a monitoring tool. The scheme now has 25 years worth of data from about 300 beaches monitored quarterly around the UK coast. Each year around 10,000 volunteers take part in the monitoring programme. The Beachwatch data also forms part of the ten-year OSPAR marine litter monitoring programme. However, only a limited number of MCS UK beaches form part of the OSPAR dataset. We would advise that the UK uses a greater number of the MCS beaches for MSFD monitoring purposes in order to get greater coverage of the UK coastline.
- **Sea floor:** The Cefas surveys in England and Wales and the fish stock and scientific survey data in Northern Ireland and Scotland form a good basis for the monitoring of sea floor litter. However the survey methodology between national partners must be standardised and care must be given to ensure that there is a consistent monitoring regime, both spatially and temporally.
- **Floating litter:** The fulmar project provides a good indication of floating litter and the UK should continue to support and grow this resource. In addition, the UK should utilize existing opportunities, such as the surveys conducted for fish stock assessments to establish a baseline of the density of floating and water column litter in different areas, as well as microlitter, using the methodologies outlined by the Technical Subgroup on Marine Litter.
- **Biota:** There is no proposed indicator for litter in biota - indicator 10.2.1 of Descriptor 10 MSFD 'Trends in the amount and composition of litter ingested by marine animals' and the proposed monitoring programme can therefore not be said to be sufficient to meet the requirements of the Directive. We believe that the long-term research programme focused on fulmars is ideally suited to monitoring trends in marine litter ingestion. Additionally, we recommend that the UK use existing data collection frameworks to collect baseline data on the amount of marine litter ingested by other species groups. Under our response to question 3, we suggest a number of pre-existing programmes which would provide a cost-effective means of monitoring trends in the amount and composition of litter ingested by different marine animals.
- **Microlitter:** This is considered in Section 4.4 of the MSFD descriptor 10 'Amount, distribution and composition of micro particles. The attribute will establish baseline quantities, properties and potential impacts of micro particles. Microplastic is likely to be the most significant part of this.' There are no targets or monitoring programmes suggested for this aspect of marine litter by DEFRA and current proposals are therefore not sufficient to meet the requirements of the Directive. Microplastics, and their associated chemical pollutants, have now been demonstrated to cause harm in fish and invertebrate species and ongoing studies are monitoring toxicological impacts in filter-feeders such as basking sharks and baleen whales. Given the wide range of ongoing research into microplastics currently being undertaken, and the work of the TSG, we believe that it is now possible to put a pilot monitoring system into place using existing data collection programs in order to collect baseline data. Details of our recommendations are given in response to question 3 below.

### **Consultation Question 2**

- The proposed monitoring programmes alone will not guide progress towards the achievement of GES and related targets. This will rely on a set of effective measures

being put in place and development of additional monitoring programmes, as outlined under question 3 below.

### **Consultation Question 3**

The following could be extended or put in place to help achieve GES.

- **Beach litter:** Extend the number of MCS beaches used for MSFD monitoring purpose. Consider using MCS volunteers to monitor beach microplastics.
- **Floating litter:** We welcome the continued commitment to monitoring floating litter through the use of fulmars as an indicator species. In addition to the existing monitoring programme of fulmars, trawl surveys for marine litter could be conducted in conjunction with existing programmes conducting fish stock assessments. These should incorporate sampling for floating and water column litter as well as microlitter using the methodologies outlined by the Technical Subgroup on Marine Litter.
- **Biota:** We recommend that the data collected from fulmars be used to examine trends in the amount and composition of marine litter ingested by marine animals. This well established research programme represents an ideal opportunity to examine long-term trends and link rates of ingestion of marine litter to health impacts and populations level effects. However, this sampling programme represents assessment of trends and impacts of marine litter interactions in just one species group, despite the fact that rates of interactions and impacts can be expected to vary between species. We therefore recommend the development of pilot programmes to examine rates of ingestion of marine litter in other species using existing data collection frameworks, as follows.
  - Cetaceans, seals and turtles: Data already being collected by existing stranding programs such as the Cetacean Stranding Investigation Program (CSIP) in the UK and similar programs in the devolved administrations should be used to monitor rates of macro and micro-litter ingestion by marine animals. Provisional evidence indicates considerable variability in rates of debris ingestion between areas and species, with turtles potentially particularly vulnerable. Collation and utilisation of existing data for marine animals would provide a baseline for determining rates and impacts and developing future targets, and has been identified as a priority by intergovernmental organisations.
  - Fish: The UK should assess the applicability of ongoing fisheries analysis for monitoring rates of ingestion of marine litter by fish, or consider the establishment of small-scale research projects focusing solely on this issue, with a focus on examination of health impacts of microplastic ingestion. A sampling protocol should be developed in collaboration with other EU Member States.
  - Invertebrates: The UK should support and report on ongoing studies being undertaken of academic institutions such as the University of Plymouth which are examining the uptake of contaminants associated with microplastics together with any associated biological consequences using deposit and filter feeding marine organisms.

- **Microlitter:** The UK should develop a monitoring protocol for microplastics. This should comprise two strands:
  - Quantification of abundance and distribution of microplastics in the marine environment: Trawl surveys conducted by Cefas could utilize appropriate techniques to quantify the abundance of micro-litter in the water column. These surveys should be consistent with those being conducted by Marine Scotland and those in the wider OSPAR region. Data being collected on occurrence and impact of microplastics through the MICRO project should also be included in reporting.
  - Examination of impacts of microplastics in biota: Filter-feeding organisms such as baleen whales and basking sharks have been selected as indicator species for the presence and impacts of microplastics in the Mediterranean under the UN MED-SDSN PLASTIC-BUSTERS project and have been proposed as indicators of microplastics under the MSFD. Research programs are also underway examining the impacts of microplastic ingestion in fish and invertebrate species. The UK should support the development of parallel, collaborative research programmes utilising existing data collection programmes such as the Cetacean Strandings Investigation Programme and work being undertaken by academic institutions in the UK as part of their MSFD monitoring programmes for microplastics.

#### ***Consultation Question 4***

Other programmes that could be considered for monitoring are:

- SAPHOS trawls – they already hold a pre-existing archive of material that could be used particularly for microlitter.
- Fishing for Litter (Kimo style) – This scheme has been successful in Scotland and the south west. We would suggest expansion of the scheme to other ports in the UK and a robust monitoring system of litter returned to port, including rates of bycatch. Fishing for Litter could in effect act as a monitoring tool and a measure.
- Networks of recreational divers e.g. Seasearch and Project Aware could be used to monitor shallow sea floor litter as many groups already conduct underwater clean ups. These should utilise pre-existing methodologies developed by the Technical Subgroup on Marine Litter.
- Unmanned submersibles could provide an alternative sampling method for benthic litter on rocky bottom habitats and slopes where the use of trawl surveys will be restricted.
- Monitoring of litter in birds' nests and rates of entanglement e.g. Gannets on Grassholm, Pembrokeshire, already takes place and could form another strand in the monitoring of litter and biota.
- Existing fish monitoring programmes could be used to monitor the presence of litter in fish.

- Windows of opportunity/opportunistic approaches should also be investigated e.g. monitoring from platforms and ferries for surface litter, pipeline camera surveys for benthic litter, cleaning of harbours.
- Current proposals do not include monitoring of rates of entanglement of marine fauna in marine litter. We recommend that the UK extend programmes focused on derelict fishing gear (such as the Deepclean initiative) to examine rates of gear loss in different fisheries and quantify rates of ghost fishing and the impacts on marine species.

## **Descriptor 11: Underwater Noise**

### ***Consultation Question 1***

- We welcome the development of a noise registry to record, assess, and manage the distribution and timing of anthropogenic sound sources including military activities, bringing together data and information already required by regulators. We note, however, that the noise registry alone is insufficient to meet the requirements of the MSFD; to restore and improve upon the current environmental status of underwater noise levels in the UK's marine ecosystems. As such, we urge Defra to be more ambitious when setting targets for this indicator. The minimum objective should be to ensure that, at the least, noise levels do not increase from those of 2014. We are of the opinion that GES is not currently being achieved for underwater noise, and to do so, the aim should be to significantly reduce both impulsive and ambient noise levels below current conditions.
- As a first step to ensure that underwater noise is at levels that do not adversely affect the marine environment, the UK should follow in the footsteps of Germany and the Netherlands, producing a standard guidance document allowing industry and the military to carry out the required noise measurements for the monitoring of activities such as seismic surveys, piling, underwater explosives that are likely to have an environmental impact upon marine organisms. Further, this noise monitoring data gathered should be correlated with observations from fish and marine mammal surveys to elucidate any interactions between noise generation and behavioural responses of marine fauna. The information gathered can be used to validate the predictions made during the noise propagation modelling in Ecological Impact Assessments, ground-truthing the potential impacts made for sensitive marine fauna (such as cetaceans and fish).

### ***Consultation Question 2***

- The operational objective of Descriptor 11 is that energy inputs into the marine environment, especially noise from human activities are minimised (Dekeling et al., 2013). Whilst the proposed monitoring programmes guide progress towards the achievement of GES, GES will not be achieved without targets for both ambient and impulsive noise levels being established with immediate effect. The MSFD requirement to achieve GES relating to underwater noise has the potential to result in better conservation outcomes for sensitive marine fauna but only if it is fully implemented. In order to achieve this, the UK needs to adopt targets that will require harmful impacts from noise to be reduced. As a first step, the UK must now set noise limits, as has been done in Germany, for activities such as pile driving which generate very loud noise underwater.

- Whilst we recognise the uncertainties that exist with underwater noise, this should not be used as an excuse not to set 'interim criteria' to help in the development of an appropriate target for Descriptor 11. Where there is a variation or uncertainty with the data, the values given should be the minimum values resulting in any behavioural effect for sensitive species i.e. harbour porpoise and herring. This would be in accordance with the precautionary principle, preventing further increases in both ambient and impulsive noise levels and reducing impacts on sensitive species. By 2020 ambient and impulsive noise levels would ideally be below and certainly should not exceed current levels of noise in the UK's marine environment if GES is to be achieved for this descriptor.
- It is recommended that the ISO standards currently being developed for the standardisation of the measurement of underwater noise are adopted on release in 2016 so that noise measurements collected by all EC member states are directly comparable, removing the potential for errors and inconsistencies in the way the measurements are performed and reported. Before this time we recommend that noise levels are reported in a range of metrics to aid the comparison of data within the noise registry. Noise criteria collected should include sound exposure levels (SEL's), cumulative SELs, peak to peak sound pressure levels (SPLs), zero to peak SPLs and root mean square for impulsive noises. Ambient noise levels should be reported as power spectral densities at different frequency levels (low and mid frequencies).

### ***Consultation Question 3***

- Ambient noise monitoring is essential in order to establish a baseline by which GES can be judged against. We recognise the complexities associated with gathering ambient noise data for the UK's regional seas in a way that recognises the large variations resulting from environmental, seasonal and anthropogenic influences. We believe that funding should be made available to develop a network of remote recording buoys throughout the UK's inshore and offshore waters, located in both remote areas and those with high activity rates such as shipping lanes. As a minimum, brief snapshots of ambient noise conditions collected during piling and seismic activities should be required as licencing conditions and should be used (in the absence of more comprehensive data) to guide progress towards the achievement of GES for the ambient noise monitoring programme.

### ***Consultation Question 4***

- Sound pressure is the parameter of primary concern for MSFD Descriptor 11. It is agreed that sound pressure is of primary importance for assessing the impact of underwater noise on marine mammals, however many fish and invertebrates are likely to be most susceptible to particle velocity. Particle velocity is a parameter that has not been specifically considered by the MSFD and requires inclusion here.
- We suggest that it will be extremely difficult and time consuming to demonstrate the effects of underwater noise at the population level as much more work is required to understand what appropriate management units are for cetaceans and fish and to better understand trends in populations over both the long term and the short term. As such, we suggest that interim criteria should be developed from the currently available peer reviewed work conducted on sensitive species for example harbour porpoise.

- The long term (>1 year) monitoring of ambient noise should be carried out by industry to establish a sufficient baseline in preparation for understanding noisy activities including pile driving, oil and gas exploration etc.
- The seismic industry has a requirement for the use of JNCC Marine Mammal Observers. Whilst this in itself is not sufficient to mitigate the widespread behavioural impacts that are possible from noisy activities, the use of MMOs to inform shut-down at least reduces injury within a small radius of the source. Shut down should be a requirement whenever marine mammals enter the 'safety zone' and not just during ramp up. The use of MMOs should be a monitoring measure that is applied to other industries as standard (alongside effective mitigation measures), including the marine renewables industry.
- Results of baseline surveys and other forms of monitoring, including impact monitoring, should be reported and mechanisms should be in place to feed such data back in a timely way to inform future decision making.
- Licensing and consent conditions should be in place to collect noise data, including where mitigation measures are employed to reduce noise levels, as well as where acoustic devices are employed to scare animals away from developments (we do not advocate this untested approach, not least of all because of the potential for wide scale displacement due to their use).
- All noisy activities, including where licensing and consent conditions are in place to monitor and to reduce noise levels, should be inputted into the database that DECC is currently developing. Military activities should also be included in the database. A feedback loop is then required to ensure that data collected can be used in a timely way to influence future decision making.

## **Appendix – Coalition members submitting this response:**

This response is supported by the following members of **Wildlife and Countryside Link**:

- Environmental Investigation Agency
- The Mammal Society
- Marine Conservation Society
- MARINELife
- ORCA
- Royal Society for the Prevention of Cruelty to Animals
- Royal Society for the Protection of Birds
- Whale and Dolphin Conservation
- Wildfowl & Wetlands Trust
- The Wildlife Trusts
- World Society for the Protection of Animals
- WWF – UK

This response is supported by the following members of **Scottish Environment LINK's Marine Task Force**:

- The Hebridean Whale and Dolphin Trust
- Marine Conservation Society
- RSPB Scotland
- Scottish Ornithologists' Club
- Whale and Dolphin Conservation

This response is supported by **Wales Environment Link's Marine Working Group**, which includes the following organisations:

- RSPB Cymru
- Wildlife Trusts Wales
- Marine Conservation Society
- WWF

This response is supported by **Northern Ireland Marine Task Force**, which includes the following organisations:

- Friends of the Earth
- Irish Whale and Dolphin Group
- Keep Northern Ireland Beautiful
- Marine Conservation Society
- National Trust
- Northern Ireland Environment Link
- Royal Society for the Protection of Birds
- Ulster Wildlife
- Wildfowl & Wetlands Trust
- WWF

