United Kingdom Voluntary National Cetacean Conservation Report, 2016

This report provides an update on cetacean conservation since

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1. Legal Developments (laws, regulations and other regulatory measures related to cetaceans)

The 28 species of cetacean recorded in UK waters are protected within a strong legal regime which encompasses both international commitments and national laws.

The UK is a party to a number of treaties and agreements, both global and regional in scope, that address cetaceans. Their obligations are effected through different mechanisms ranging from specific implementing legislation, to less binding instruments such as codes of practice, recommendations, and guidelines.

Key treaties the UK is party to include:

- United Nations Convention on the Law of the Sea 1982 (UNCLOS)
- International Convention for the Regulation of Whaling 1946 (ICRW)
- The Convention on the Conservation of European Wildlife and Natural Habitats 1979 (Bern Convention)
- Convention on the Conservation of Migratory Species of Wild Animals 1979 (CMS)
- Convention on Biological Diversity 1992 (CBD)
- Convention for the Protection of the Marine Environment of the North-East Atlantic (OSPAR)
- Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES)

Within the European Union, the most significant provision for the protection of cetaceans comes from the **Habitats and Species Directive**[1]. Under the Directive, all cetacean species are listed as species of Community Interest and Member States are required to maintain these species in, or restore them to, a favourable conservation status in those parts of their territory to which the Treaty applies (in essence in territorial waters and in waters out to 200 nautical miles from baselines). In addition, all cetaceans are listed in Annex IV of the Directive and so are protected from deliberate disturbance, capture or killing within EU waters. The Directive also prohibits the keeping, transport and sale or exchange of specimens taken from the wild.

Further to this strict protection, the Directive requires the UK to establish a network of Special Areas of Conservation (SACs) to protect key habitats and species, known collectively as the "Natura 2000 Network". To date harbour porpoise and bottlenose dolphin are the only species identified for the designation of SACs (see section 2.2). These requirements have all been transposed into domestic UK legislation, for example under 'the Conservation of Habitat and Species Regulations 2010'.

The **Marine Strategy Framework Directive**[2] (MSFD), which was adopted in 2008, also provides for the protection of cetaceans through the aim of achieving Good Environmental Status (GES) for the marine environment by 2020. Member States are required to put in place targets and indicators, monitoring, and programmes of measures to help deliver GES. In the UK this has been delivered through the publication of a UK Marine Strategy. Part one of this strategy was the initial assessment of UK waters (published 2012). Part Two

[1] http://ec.europa.eu/environment/nature/legislation/habitatsdirective/index_en.htm
[2] http://ec.europa.eu/environment/marine/eu-coast-and-marine-policy/marine-strategy-framework-directive/index_en.htm

(published 2014[3]) outlines the UK monitoring programmes and Part 3 (published 2015[4]), sets out a programme of measures necessary to achieve good environmental status.

As a framework directive MSFD brings together activities to allow us to establish an overarching understanding of the state of our seas and the impact of any measures taken. In the UK, the programme of measures to achieve GES of UK waters includes a number of pre-existing measures which contribute to the protection of cetaceans:

- EC Habitats Directive 92/43/EEC and the Conservation of Habitats and Species Regulations
- International Whaling Commission (IWC): The Whaling Industry Regulation Act 1934, as amended by the Fisheries Act 1981.
- ASCOBANS (Agreement of the Conservation of Small Cetaceans of the Baltic, North East Atlantic, Irish and North Seas) (Daughter Agreement Under the Convention on Migratory Species)
- Convention on the International Trade of Endangered Species (CITES)
- Bycatch Measures: Implementation of EC Regulation 812/2004: South West Territorial Waters (prohibition of pair trawling) order 2004: Domestic legislation banning the seasonal use of pair trawls in English waters within the South West English Channel to prevent the bycatch of dolphins
- Guidance and codes of conduct: Guidance is also in place in the UK for marine users who are planning to carry out activities in the marine environment which have the potential to kill, injure or disturb a marine European Protected Species (i.e. any cetacean species). The JNCC, Natural England, Scottish Natural Heritage, and the Natural Resources Wales have good practice guidelines and protocols in place for specific activities to minimize the risk of injury and to cetaceans.

The UK Marine Strategy also sets out the following targets for cetaceans:

- At the scale of the MSFD sub-regions, the distribution of cetaceans is not contracting as result of human activities: in all of the indicators monitored there is no statistically significant contraction in the distribution of marine mammals caused by human activities.
- At the scale of the MSFD sub-regions, abundance of cetaceans is not decreasing as a result of human activity: in all of the indicators monitored, there should be no statistically significant decrease in abundance of marine mammals caused by human activities.
- At the scale of the MSFD sub-regions, cetacean populations are in good condition: mortality of cetaceans due to fishing bycatch is sufficiently low so as not to inhibit population size targets being met.

These targets reflect existing commitments under the Habitats Directive. They aim to ensure that marine mammal distribution is not significantly affected by human activities and that their abundance is not decreasing as a result of human activities, using baselines consistent with those used for the Habitats Directive. Specific targets have also been developed for the condition of marine mammals, looking at species productivity and the impacts from key pressures, such as bycatch.

There has been a concerted effort to coordinate UK monitoring programmes with those of other Member States sharing the North East Atlantic to ensure that the assessments carried out are comparable. This work has been carried out both in the OSPAR Convention (primarily ICG-COBAM) and through the Marine Mammal Technical Sub-Group.

In the OSPAR Convention, work has focussed on the harmonisation of targets and indicators, potential measures, monitoring programmes and areas for further research. The UK will continue to participate within OSPAR and especially ICG-COBAM and its Expert Group for Mammals, to ensure a coordinated approach for cetaceans across Descriptors 1 & 4 of the MSFD.

[3] https://www.gov.uk/government/publications/marine-strategy-part-two-uk-marine-monitoring-programmes
[4] https://www.gov.uk/government/publications/marine-strategy-part-three-uk-programme-of-measures

We are currently working to finalise our first assessments to contribute to the 2017 OSPAR Intermediate Assessment which will contribute to the UK 2018 MSFD report on progress to achieving GES.

The **EU Cetacean By-Catch Regulation**[5] (Regulation 812/2004) has also been fully implemented in the UK. This regulation introduces technical measures, such as the use of acoustic deterrent devices (ADDs), for gill nets in specified areas. It also puts in place a monitoring system on board certain categories of fishing vessels to ensure information on by-catches of cetaceans in "at risk" fisheries is collected.

All cetaceans are also fully protected in UK waters under sections 4A and 5 of the UK Wildlife and Countryside Act 1981[6].

The UK also has in place a licensing framework for regulating certain marine activities, including those related to developments i.e. renewable energy, extraction, aggregates, disposal, dredged material. In issuing licenses for marine activities, consideration is given to impacts on the marine environment, including potential harm to cetaceans. Guidance on disturbance is available and Marine Mammal Mitigation Protocols (MMMPs) adopted to mitigate harm and disturbance to cetaceans from human activities and developments such as piling[7] and the use of explosives[8] are available.

Fisheries enforcement bodies in the UK, such as the Marine Management Organisation (MMO), adopt an intelligence led risk based enforcement model to direct enforcement activities and resources. Any intelligence received by these bodies in relation to offences against cetaceans or anthropogenic impacts is considered and appropriate action taken.

The Exclusive Economic Zone Order 2013 came into force on 31st March 2014. This boundary relates to rights under Part V of the United Nations Convention on the Law of the Sea. The new Exclusive Economic Zone (EEZ) replaces the 200nm fishing limit.

2. Current Government Programs Related to Cetacean Conservation

2.1 UK surveillance and monitoring programme

A dedicated protected species bycatch monitoring programme is in place and operated by the Sea Mammal Research Unit (SMRU). Fisheries research laboratories operating discard observer programmes in the UK also provide data which are included in our assessment of cetacean bycatch. Whilst the UK observer scheme relies upon good collaborative links with industry, fisheries regulations have been enacted in England and Scotland to ensure that there is also a legal obligation for skippers and owners to allow observers on board when asked to do so. There is also an obligation under the Data Collection Framework (DCF) (in Northern Ireland) for offshore vessels to accommodate scientific observers when requested to do so and an active observer programme is run by Agri-Food and Biosciences Unit (AFBI). Additionally, in Northern Ireland, the Department of Agriculture, Environment and Rural Affairs (DAERA) Inshore Fisheries Work Programme deploys observers to inshore vessels, though there is no legal obligation, and this is undertaken by AFBI through good relations with the industry. This programme aims to maintain at least 42 observer days annually to report cetacean bycatch from the Northern Ireland static gear fishery.

The Joint Cetacean Protocol (JCP) project[9] was initiated in 2006. The JCP assembled disparate effort-related cetacean sightings datasets from all major sources covering north-west European Atlantic waters e.g. SCANS I and II; CODA surveys; European Seabirds at Sea database (ESAS); Sea Watch Foundation (SWF); Atlantic Research Coalition (ARC). It also included data from non-governmental and marine renewable industry sources. Three analyses of the JCP data resource have been completed to date, with the Phase III analysis producing species specific density layers at the UK scale. The final outputs were modelled density surfaces for seven

[5]http://europa.eu/legislation_summaries/maritime_affairs_and_fisheries/fisheries_resources_and_environment/l66024_en.htm
[6] http://jncc.defra.gov.uk/page-1377
[7] http://jncc.defra.gov.uk/pdf/JNCC_Guidelines_Piling%20protocol_August%202010.pdf
[8] https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/50007/jncc-ex-guide.pdf
[9] http://jncc.defra.gov.uk/page-5657

species averaged over time, with associated uncertainty. The JCP III report has recently been published[10].

The UK is supporting the SCANS III survey which is being coordinated by the University of St Andrews. The objective of the survey was to estimate the abundance of all cetacean species in shelf and oceanic waters of the European Atlantic. The survey took place in July and August and was conducted through aerial and vessels surveys. The aerial survey effort covered shelf waters ranging from north of Norway to the coastal waters off Portugal. The vessel surveys were conducted in four different areas covering off shelf waters off Scotland and part of the Bay of Biscay as well as waters off Denmark, Sweden and Germany. The project will deliver updated abundance estimates for the most frequently seen species and will report in 2017.

Natural Resources Wales (NRW) commissioned the monitoring of bottlenose dolphin in Cardigan Bay and Pen Llŷn a'r Sarnau Special Areas of Conservation in 2014, 2015, and 2016 (3-year report in preparation). Additionally, NRW commissioned WDC to conduct vantage-point and, where possible, boat-based surveys of Risso's dolphins off Bardsey Island (North Wales) in 2014, 2015 and 2016 (final 3-year report in preparation).

Additionally, in 2015 and 2016, NRW commissioned SMRU to assess relevant fishing effort and potential marine mammal bycatch in Welsh waters (final report in preparation).

In 2015-16, as part of the NERC and Defra funded Marine Ecosystems Research Programme (MERP), SWF observers started to undertake cetacean & seabird surveys aboard Bangor University's research vessel 'Prince Madog' and the Cefas research vessel 'Cefas Endeavour'. These surveys cover mainly areas in the Celtic Sea and Irish Sea, but also off SW and eastern England. Coastal surveys have also been undertaken on a regular basis off the Yorkshire coast using whale watch vessels as platforms of opportunity.

Also, as part of MERP, survey data sets of cetacean sightings, physical oceanographic variables and prey data from the last 30 years are being compiled to examine potential environmental drivers of spatio-temporal patterns in distributions of all regular cetacean species occurring in NW European waters.

WDC conducted photo-ID surveys off the Isle of Lewis in Scotland and from Bardsey Island in North Wales in 2015. The WDC Shorewatch Programme has collected effort-based cetacean sightings from Spey Bay since 2005 and from wider sites around Scotland since 2010[11]. WDC holds records of more than 30,000 effort-based cetacean watches by trained observers. The Shorewatch database went live during 2015 and is a fully web-accessible for trained volunteers with reduced accessibility for the wider public. In accordance with SNH funding, all recorded sightings are made fully available to the public through the NBN gateway[12].

In 2015 AFBI began collecting photo-ID images for bottlenose dolphins via social media and collated this with data collected by DAERA and from the Irish Whale and Dolphin Group (IWDG) sighting scheme. Identifications will be cross-checked and where appropriate individuals will be incorporated into existing catalogues. Results from the work are due to be published in 2016. In2015-2016 AFBI started to undertake towed Passive Acoustic Monitoring surveys during routine AFBI research cruises, mainly covering the Irish Sea.

AFBI and IWDG have commenced a DAERA funded project conducting acoustic monitoring in the Skerries and Causeway SAC. Monitoring began in spring 2016. The project will deliver a preliminary assessment of temporal patterns in species occurrence (harbour porpoise and dolphin spp).

2.2 UK Marine Protected Areas (MPAs)

The following MPAs are in place within UK waters and specifically name cetaceans as either a qualifying or non-qualifying feature.

- Cardigan Bay/Bae Ceredigion SAC with bottlenose dolphin considered as a qualifying feature.
- Pen Llyn a`r Sarnau/ Lleyn Peninsula and the Sarnau SAC with bottlenose dolphin considered a qualifying feature, but not a primary reason for site selection.
- Moray Firth SAC with bottlenose dolphin considered as a qualifying feature.

[10] http://jncc.defra.gov.uk/page-7201
[11] www.whales.org/shorewatch
[12] www.nbn.org.uk/

- Skerries and Causeway SAC with harbour porpoise considered as a qualifying feature.
- The UK section of Dogger Bank SAC in the North Sea with harbour porpoise, harbour seal and grey seal considered as non-qualifying features (Grade D).
- Croker Carbonate Slabs SAC in the Irish Sea with harbour porpoise and grey seal considered as non-qualifying features.
- Pisces Reef Complex SAC in the Irish Sea with harbour porpoise, grey seal, and harbour seal considered as non-qualifying features.
- Wight-Barfleur Reef SAC in the English Channel with harbour porpoise and bottlenose dolphin considered as non-qualifying features.
- Pobie Bank Reef and Solan Bank Reef in the Scottish offshore region with harbour porpoise, harbour seal and grey seal considered as non-qualifying features.
- Sound of Barra SAC with harbour porpoise and bottlenose dolphin considered as non-qualifying features.
- Mousa SAC in the North Sea with harbour porpoise considered as a non-qualifying feature.
- Solway Firth SAC in the Irish Sea with harbour porpoise considered as a non-qualifying feature.
- Plymouth Sound and Estuaries SAC in the Western Channel and Celtic Seas with harbour porpoise and bottlenose dolphin considered as non-qualifying features.
- Fal and Helford SAC in the Western Channel and Celtic Seas, with harbour porpoise and bottlenose dolphin considered as non-qualifying features.
- Lundy SAC in the Western Channel and Celtic Seas with harbour porpoise and bottlenose dolphin considered as non-qualifying features.
- Pembrokeshire Marine/ Sir Benfro Forol SAC in the Western Channel and Celtic Seas/Irish Sea with harbour porpoise and bottlenose dolphin considered as non-qualifying features.
- Isles of Scilly Complex SAC in the Western Channel and Celtic Seas with harbour porpoise and bottlenose dolphin considered as non-qualifying features.
- St Kilda SAC on the Scottish Continental Shelf with harbour porpoise and bottlenose dolphin considered as non-qualifying features.
- Papa Stour SAC in the on the Scottish Continental Shelf with harbour porpoise considered as a non-qualifying feature.
- Loch nam Madadh SAC in the Minches and Western Scotland with harbour porpoise considered as a non-qualifying feature.
- Lochs Duich, Long and Alsh Reefs SAC in the Minches and Western Scotland with harbour porpoise considered as a non-qualifying feature.
- Sound of Arisaig (Loch Ailort to Loch Ceann Traigh) SAC in the Minches and Western Scotland with harbour porpoise considered as a non-qualifying feature.
- Firth of Lorn SAC in the Minches and Western Scotland with harbour porpoise considered as a non-qualifying feature.
- Ascrib, Isay and Dunvegan SAC in the Minches and Western Scotland with harbour porpoise considered as a non-qualifying feature.
- Sullom Voe SAC in the Scottish Continental Shelf with harbour porpoise considered as a non-qualifying feature.
- Treshnish Isles SAC in the Minches and Western Scotland with harbour porpoise considered as a non-qualifying feature.
- Firth of Tay & Eden Estuary SAC in the Northern North Sea with harbour porpoise and bottlenose dolphin considered as non-qualifying features.

- Wyville Thomson Ridge SAC in the Atlantic North-West Approaches, Rockall Trough and Faroe-Shetland Channel with bottle nose dolphin considered as a non-qualifying feature.
- North West Rockall Bank SAC in the Atlantic North-West Approaches, Rockall Trough and Faroe-Shetland Channel with harbour porpoise considered as a non-qualifying feature.
- Haisborough, Hammond and Winterton SAC in the Southern North Sea with harbour porpoise considered as a non-qualifying feature.
- Inner Dowsing, Race Bank and North Ridge SAC in the Southern North Sea with harbour porpoise considered as a non-qualifying feature.
- The Maidens SAC in the Irish Sea with harbour porpoise considered as a non-qualifying feature.
- Monach Islands SAC in the Scottish Continental Shelf with harbour porpoise considered as a non-qualifying feature.
- Sanday SAC in the Scottish Continental Shelf with harbour porpoise considered as a non-qualifying feature.
- Sunart SAC in the Minches and Western Scotland with harbour porpoise considered as a non-qualifying feature.

Other protected areas including other Special Areas of Conservation (SACs), Nature Conservation Marine Protected Areas (NC MPAs), and Marine Conservation Zones (MCZs) are in place for other features in the UK (and the management measures associated with them) which will indirectly contribute to the conservation of cetaceans in UK waters. Web-based Site Information Centres now exist for all designated offshore sites, detailing site summary information, and regularly updated information on conservation objectives, data and management[13].

The UK Statutory Nature Conservation Bodies (SNCBs) have continued work to identify potential SACs for harbour porpoise. Following a formal consultation on five possible SACs for harbour porpoise located in the waters of Wales[14], England, Northern Ireland, and the offshore area, in early 2016, new advice was recently submitted for consideration by the relevant UK governments. This report is currently being reviewed and a decision on the next steps will be taken in due course.

Scotland:

The Marine (Scotland) Act and Marine and Coastal Access Act includes new powers for Nature Conservation Marine Protected Areas in the seas around Scotland, to recognise features of national importance and meet international commitments for developing a network of MPAs. Scottish Natural Heritage and the Joint Nature Conservation Committee, as part of the Marine Scotland-led Scottish MPA Project, have identified MPA search features (marine habitats and species) to guide the selection of Nature Conservation MPAs.

The initial stages of the work to identify a Special Area of Conservation (SAC) for harbour porpoise in the West Scotland Management Unit (MU) (IAMMWG, 2015a) began late 2015. This process identified the Inner Hebrides and the Minches as a possible SAC site for harbour porpoise. A formal consultation completed between 23 March 2016 and 18 May 2016 and the Inner Hebrides and the Minches candidate SAC for harbour porpoise was subsequently submitted to the European Commission on 22 September 2016.

In 2014, formal advice was submitted to the Scottish Government advising on three Nature Conservation Marine Protected Areas (NCMPAs) to protect important areas on Scotland's west coast specifically for minke whales and Risso's dolphins[15]. A consultation on these sites is expected to be undertaken in 2017. For further information on all NC MPA sites, visit the SNH webpages[16].

[13] http://jncc.defra.gov.uk/page-6895
[14] www.naturalresources.wales/mn2k
[15] http://www.snh.gov.uk/protecting-scotlands-nature/protected-areas/national-designations/marine-protected-areas-(mpa)/scottish-mpa-network-advice/
[16] http://www.gov.scot/Topics/marine/marine-environment/mpanetwork

Northern Ireland:

The Department of Environment for Northern Ireland held a Marine Conservation Zone Workshop in March 2015 that presented proposed boundaries for Special Areas for Conservation for harbour porpoises stakeholders. NGOs were invited to provide feedback. Four new MCZs have been proposed and the formal consultation ran from December 2015 until March 2016.

The North Channel pSAC for harbour porpoise was proposed in the waters of Northern Ireland. The consultation is now complete, and the advice has been submitted to Ministers. The boundaries of the harbour porpoise possible SACs can be obtained by emailing JNCC[17].

Details of all UK SACs are publically available[18], and details of designated NC MPAs and MCZs can be found on the respective lead agency sites. All offshore sites have a Site Information Centre[19], and contain boundary information amongst all other available site information. Details of all inshore MCZs[20] and inshore and offshore NC MPAs[21] is also available online.

3. Current threats to Cetacean Conservation and Management Measures Taken/Proposed

3.1 Bycatch

The two species most commonly acknowledged to be affected by fishing in UK waters are the harbour porpoise and the short-beaked common dolphin. All Reports to the European Commission on activities conducted by the UK under Regulation 812/2004[22], and under Article 12(4) of the Habitats Directive, provide details of the monitoring work undertaken in the UK and estimates of cetacean bycatch. The most recent reports on cetacean bycatch in UK waters submitted to the European Commission under the requirements of EC Regulation 812/2004 and Article 12 of the EU Habitats Directive can be found on the Department for Environment Food and Rural Affairs (Defra) website[23].

A dedicated protected species bycatch monitoring programme is in place and operated by the Sea Mammal Research Unit (SMRU). Fisheries research laboratories operating discard observer programmes in the UK also provide data which are included in our assessment of cetacean bycatch. Whilst the UK observer scheme relies upon good collaborative links with industry, fisheries regulations have been enacted in England and Scotland to ensure that there is also a legal obligation for skippers and owners to allow observers on board when asked to do so. There is also an obligation under the Data Collection Framework (DCF) (in Northern Ireland) for offshore vessels to accommodate scientific observers when requested to do so and an active observer programme is run by Agri-Food and Biosciences Unit (AFBI). Additionally, DAERA Inshore Fisheries Work Programme deploys observers to inshore vessels, though there is no legal obligation, and this is undertaken by AFBI through good relations with the industry. This programme aims to maintain at least 42 observer days annually to report cetacean bycatch from the Northern Ireland static gear fishery.

The principal area of concern for cetacean bycatch remains the South-Western waters of the Western English Channel and Celtic Sea. Monitoring remains focused in the SW to reflect perceived bycatch risk, but has also been carried out to a lesser extent in the North Sea and Irish Sea. As more data are collected and compiled, estimates of bycatch rates will improve.

The latest UK cetacean bycatch report for 2015, as required under EU Regulation 812/2004, estimates that for 2015 bycatch rates were in the region of 1200 to 1500 harbour porpoises. These data indicate that harbour porpoise bycatch rates may have increased slightly in recent years, but the reasons for this are not yet

[17] porpoise@jncc.gov.uk
[18] http://jncc.defra.gov.uk/page-23
[19] http://jncc.defra.gov.uk/page-6895
[20] https://www.gov.uk/government/collections/marine-conservation-zone-2013-designations#inshore-sites
[21] http://www.gov.scot/Topics/marine/marine-environment/mpanetwork/developing/DesignationOrders
[22] http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2004:150:0012:0031:EN:PDF
[23] http://randd.defra.gov.uk/Default.aspx?Menu=Menu&Module=More&Location=None&ProjectID=18535

understood (please see the UK Report under Regulation 812/2004 for elaboration). It should be noted that unlike in earlier years where bycatch estimates were only included for those fisheries where sufficient sampling had been undertaken (leading to bycatch estimates of around 700-800 harbour porpoises per year), since 2013 estimates have included extrapolations for all UK gillnet fisheries, whether they have been sampled or not, so as to provide an overall maximum estimate for all UK vessels using gillnets. Estimates produced in this way will be higher than those estimates restricted to core fisheries and areas, and are likely to be overestimates and biased for several reasons, and should therefore be treated with caution. Work is ongoing to try to refine the estimates by overcoming some of the statistical issues that are evident in the current analysis.

3.2 Implementation of methods to reduce bycatch

The UK continues to fully implement and enforce Council Regulation (EC) 812/2004 through the use of acoustic deterrent devices (pingers) attached to fishing nets. Implementation of the regulation in the UK has involved close liaison with the industry and ongoing monitoring and support to aid compliance. This has been led primarily by the Marine Management Organisation (MMO). Enforcement of the regulation at the quayside in England is carried out by MMO officers, at sea in English and offshore Welsh waters by the Royal Navy dedicated fisheries patrol vessels in conjunction with MMO officers. In Scotland, enforcement is undertaken by the Marine Scotland Compliance and Enforcement Unit. Further information is available on the MMO website[24].

Monitoring of vessels using acoustic deterrent devices (ADDs), or 'pingers' has continued. The bass pair trawl fishery, which in the past has been a source of concern with respect to common dolphin bycatch, was effectively ended in 2014 due to concerns over bass stocks and no further monitoring of pinger effectiveness in that fishery has been possible. Monitoring of pingers has since been restricted to the offshore gillnet fleet operating in ICES Subarea 7 from the South West UK and to the Spanish owned UK registered fleet when they operate in Subareas 4 and 7 where pingers are required. This monitoring is designed to help assess the longer-term effects of pingers on cetacean bycatch rates and other potentially associated effects (such as seal depredation levels) in these fisheries.

A number of relevant research projects have been carried out by the Scottish Government, including a project on 'Evaluating and Assessing the Relative Effectiveness of Acoustic Deterrent Devices and other Non-Lethal Measures on Marine Mammals'. The aim of this project was to carry out a comprehensive literature and data review on the capabilities of current and developing non-lethal measures for deterring marine mammals. The final report is available online[25], as is information on this and other cetacean bycatch avoidance research undertaken by the Scottish Government[26].

3.3 Research proposals

At the 2014 IWC meeting, the UK was pleased to provide a voluntary contribution of £20,000 to the IWC's Welfare Initiative to help deliver the ambitious Welfare Action Plan agreed during IWC65. The UK was also pleased to provide a voluntary contribution of £10,000 to the IWC's Small Cetaceans Fund in order to support its continued work in delivering improvements to the conservation status of small cetaceans worldwide.

During the intersessional period since IWC65, the UK played a key role in setting up the IWC's Voluntary Conservation fund. In March 2016 the UK was pleased to donate £10,000 to support the IWC's conservation work.

3.4 Renewables

A large research project on marine mammals, 'Marine Mammal Scientific Support Research Programme (MMSSRP)', undertaken by the Sea Mammal Research Unit at the University of St Andrews and funded by the Scottish Government is in its second phase with a completion date in March 2019. The research programme focuses on three main themes, one of them being the impacts of Marine Renewable Energy on

[24] http://www.marinemanagement.org.uk/fisheries/monitoring/regulations_cetaceans.htm
[25] http://www.gov.scot/Publications/2014/10/8271
[26] http://www.scotland.gov.uk/Topics/marine/marineenvironment/species/19887/20826

marine mammals. Information on the project and some of the outputs can be found online[27],[28].

To improve our understanding of how animals perceive and respond to devices, the Scottish Government funded the first demonstration project aimed at developing and testing the capabilities of a suite of technologies for monitoring the fine-scale movements of marine mammals in tidally energetic environments. This research is the first phase of a wider project to track marine mammals around tidal turbines, with the primary purpose of detecting collisions or localised avoidance/displacement behaviour of marine mammals within an operational tidal array. The outcome of the project was the development of a suite of technologies including: passive and active sonar devices; and video surveillance and tagging technologies. The report can be found online[29]. Now that the appropriate technologies have been developed and tested, the next phase of the project is to deploy the monitoring technologies in the Pentland Firth at one of the first commercial tidal project in Scottish waters. With turbine deployment planned to commence in winter 2016, this work will provide a tailored system for understanding the behaviour of marine mammals around an operational tidal turbine array.
During 2015 the SMRU completed a Natural Environment Research Council (NERC) funded 'Knowledge Exchange' project entitled 'Designing and building an autonomous device to track harbour porpoise movements in tidal rapids'. A report is available online[30].

East Coast Marine Mammal Acoustic Studies (ECOMMAS) is an ongoing project delivered by Marine Scotland Science. An array of acoustic loggers to detect harbour porpoises and dolphins along the east coast of Scotland was deployed in 2016, for a fourth consecutive year; data analysis is in progress. The results will be used to inform impact assessments for renewable energy developments and also to provide data for reporting on MSFD Descriptor 11[31].

A shore-based digiscoping project (funded by Environment Wales) has been in operation within Cardigan Bay SAC, collecting images for the long-term photo-ID monitoring project[32].

Natural Resources Wales working with SMRU Consulting, Sea Mammal Research Unit and the Scottish Association of Marine Sciences have recently published a new set of guidance on marine mammal surveying requirements at wave and tidal stream energy sites in Wales. This report now provides a framework for assessing risk to marine mammals from wave and tidal stream developments and provides guidance on how to tailor surveys to provide better information for impact assessments[33].

4. Reporting Systems for Cetacean Injuries/Mortality/Strandings

4.1 Research on the effects of pollutants on cetacean health

As a result of the on-going collaboration between the Centre for Environment, Fisheries and Aquaculture Science (CEFAS) and the CSIP, along with additional collaborations with a number of European partner organisations, the Institute of Zoology lead a large pan-European study of polychlorinated biphenyl (PCB) concentrations in over 1,000 cetaceans of four species that was submitted for publication in 2015 and published in 2016 [34]. The study

[27] http://www.smru.st-andrews.ac.uk/pageset.aspx?psr=152#scotgov
[28] http://www.gov.scot/Topics/marine/marine-environment/species/19887/20826/MMSS
[29] http://www.gov.scot/Resource/0050/00501574.pdf
[30] http://www.smru.st-and.ac.uk/documents/nerc/NERC_MRE_KEP_Tracking_Harbour_Porpoises_in_Tidal_Rapids.pdf
[31] http://www.gov.scot/Topics/marine/science/Publications/TopicSheets/ECOMMAS
[32] http://www.seawatchfoundation.org.uk/cardigan-bay-monitoring-project/
[33] See Sparling, C., Smith, K., Benjamins, S., Wilson, B., Gordon, J., Stringell, T., Morris, C., Hastie, G., Thompson, D. & Pomeroy, P. (2015) Guidance to inform marine mammal site characterisation requirements at wave and tidal stream energy sites in Wales. NRW Evidence Report Number 82. 87pp. Natural Resources Wales, Bangor. Available at: https://naturalresources.wales/our-evidence-and-reports/guidance-to-inform-marine-mammal-and-tidal-stream-energy-sites-in-wales/?lang=en]
[34] Jepson, P.D., Deaville, R., Barber, J.L., Aguilar, À., Borrell, A., Murphy, S., Barry, J., Brownlow, A., Barnett, J., Berrow, S., Cunningham, A.A., Davison, N.J., ten Doeschate, M., Esteban, R., Ferreira, M., Foote, A.D., Genov, T., Giménez, J., Loveridge, J., orcas and other Llavona, Á., Martin, V., Maxwell, D.L., Papachlimitzou, A., Penrose, R., Perkins, M.W., Smith, B., de Stephanis, R., Tregenza, N., Verborgh, P., Fernandez, A. and Law, R.J. (2016) PCB pollution continues to impact populations of dolphins in European waters. Scientific Reports 6: 18573 doi:10.1038/srep18573

included PCB data on harbour porpoises (HPs) (n=706), bottlenose dolphins (BNDs) (n=138), striped dolphins (SDs) (n=220) and killer whales (KWs) (n=24) sampled across Europe between 1990 and 2012. PCBs concentrations in all 4 species were moderately high (harbour porpoises) or excessively high (dolphins). The SDs, BNDs and KWs had mean and median PCB levels that markedly exceeded all known marine mammal PCB toxicity thresholds. Time trend analyses also showed that PCBs stopped declining in 1998 (UK HPs) and around 2002 for SDs in the Mediterranean Sea. The Iberian Peninsula was a global marine mammal "PCB hotspot" in both North Atlantic and Mediterranean Sea regions. Despite regulations and mitigation measures to reduce PCB pollution, their bioaccumulation in marine food webs continues to be a cause of concern regarding their potential impacts on some cetacean populations. The few remaining coastal KW populations appear close to extinction within the industrialized regions of Europe. Small or declining populations of BNDs and KWs in the NE Atlantic region were associated with low calf recruitment, consistent with PCB-induced reproductive toxicity. The authors concluded that high and stable PCB exposures are associated with small populations, long-term population declines or contraction of range in several dolphin species in Europe (NE Atlantic and Mediterranean Seas) that were not adequately explained by other factors (e.g. bycatch or other anthropogenic causes of mortality)[35]. Bycatch is common in the most abundant cetacean species in Europe, but is comparatively rare in bottlenose dolphins and virtually unrecorded for killer whales, suggesting that the ongoing population declines in these two species are predominantly driven by other processes, with bioaccumulation of PCBs through marine food chains being the predominant factor. PCB pollution remains a major threat to marine apex predators globally, not just in Europe[36].

Two other toxicological studies on UK-stranded HPs were published in 2015. The first[37] showed PCB exposure in blubber of 329 UK-stranded female HPs (1990-2012). In sexually mature females, 25/127 (19.7%) showed direct evidence of reproductive failure (foetal death, aborting, dystocia or stillbirth). A further 21/127 (16.5%) had infections of the reproductive tract or tumours of reproductive tract tissues that could contribute to reproductive failure. Resting mature females (non-lactating or non-pregnant) had significantly higher mean ∑PCBs (18.5 mg/kg) than both lactating (7.5 mg/kg) and pregnant females (6 mg/kg), though not significantly different to sexually immature females (14.0 mg/kg). Blubber ΣPCBs were found to be a significant predictor of mature female reproductive status, with resting (non-pregnant) females more likely to have a higher PCB burden. HPs that died of infectious disease were significantly less likely to be pregnant than "healthy" trauma cases. Lactating females were also more likely to be in good health status compared to other individuals. Based on PCBs (>11 mg/kg lipid), at least 29/60 (48%) of resting females had not fully offloaded their PCB burden via gestation/lactation - consistent with foetal or newborn mortality. A much lower pregnancy rate of 50% was estimated for "healthy" females that died of traumatic causes of death, compared to other HP populations in more pristine environments that calve annually (e.g. Iceland; Greenland).

The second HP toxicology study[38] published in 2015 analysed a suite of 20 organophosphorus flame retardant compounds in blubber and liver tissue of 20 UK-stranded HPs during 2012. Fourteen of the twenty compounds were below the limits of quantification in all samples. Six could be quantified at maximum concentrations (in blubber) between 6.7 and 246 mg kg_1 wet weight. These levels do not suggest a high level of concern regarding potential impacts.

The study of temporal trends of PCBs in UK harbour porpoises was extended to include animals stranded up to the end of 2013 (now 1990-2013). PCB concentrations have shown no significant decline since 1997 following earlier reductions due to regulation of commercial use. However, porpoises recovered in Scottish waters may be showing the beginning of a decline, though sample sizes are still too small to be sure. Further reductions in PCB

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[35] Jepson et al, 2016.

[36] Jepson, P.D. and Law R.J. (2016) Persistent pollutants, persistent threats: Polychlorinated biphenyls remain a major threat to marine apex predators such as orcas. Science 352: 1388-1389. doi: 10.1126/science.aaf9075

[37] Murphy, S., Barber, J.L. Learmonth, J.A., Read, F.L., Deaville, R., Perkins, M.W., Brownlow, A., Davison, N., Penrose, R., Pierce, G.J., Law, R.J. and Jepson, P.D. (2015) Reproductive Failure in UK Harbour Porpoises (Phocoena phocoena): Legacy of Pollutant Exposure? PLoS ONE, DOI:10.1371/journal.pone.0131085

[38] Papachlimitzou A., Losada S., Barber J.L., Bersuder P., Deaville R., Brownlow A, Penrose R., Jepson P.D. and Law R.J. (2015) Organophosphorus flame retardants (PFRs) and plasticisers in harbour porpoises (Phocoena phocoena) stranded or bycaught in the UK during 2012. Marine Pollution Bulletin Available online 19 June 2015, ISSN 0025-326X http://dx.doi.org/10.1016/j.marpolbul.2015.06.034

levels in UK waters are likely to take decades. Blubber PCB concentrations are still at toxicologically significant levels in many stranded harbour porpoises[39] Additional samples from harbour porpoises which stranded in the UK during 2014 were analysed for PCBs in early 2016 and samples from 2015 will be analysed by early 2017, with the aim of publishing updated trends data in 2017-18.

20 harbour porpoises stranded in 2011 and 2012 have been analysed for levels of dioxins and dioxin-like PCBs in their blubber. Dioxin-like toxicity effect quotients (TEQs) for all samples were well below thresholds calculated to cause effects in marine mammals. The greatest contribution to TEQs came from dioxin-like PCBs, except for some samples from Scotland were polychlorinated dibenzofurans (PCDFs) had a higher contribution, generally because PCB levels were lower. TEQ values were similar to those found around Scotland and the North Sea around the late 1990s, in support of our studies that show that non-dioxin-like PCBs concentrations are stable in UK harbour porpoises. Publication of a manuscript describing the analyses is anticipated in 2017 [40].

Also, during 2015, twenty additional harbour porpoise blubber and liver samples were sent to CEFAS by the CSIP. Temporal trends of two other classes of contaminant are being assessed by analysing their concentrations in UK harbour porpoises. Hexabromocyclododecane (HBCDD) is being analysed in blubber of 20 animals stranded in 2014 and a suite of 15 perfluorinated chemicals, including perfluorooctane sulphonate (PFOS), is being analysed in liver samples of 51 animals stranded from 2012-2014. These classes of contaminants were last analysed in UK samples in 2006 and 2003, respectively. Results will be submitted for publication during 2017.

4.2 Collection of Data on Marine Debris

As part of its remit under contract to UK Government, the CSIP collates data and information on evidence of marine debris ingestion and entanglement found during post-mortem examination of UK stranded cetaceans. This data is available in appendices within the CSIP annual reports to UK government (2006-2015) [41]. Data from the 25 year period of strandings investigation in the UK is currently being collated by the CSIP and will be published in 2017. The CSIP is also involved in an ongoing collaboration with Exeter University, which aims to assess the gastro-intestinal tract of UK stranded marine mammals for any evidence of microplastics. During the period of this report, a paper was published describing evidence of marine debris ingestion in sperm whales which stranded around the North Sea during an unusual mortality event in early 2016[42].

The Hebridean Whale and Dolphin Trust (HWDT) collects data on the distribution of human activities known, in particular regarding creels, acoustic deterrent devices and floating litter , so as to provide a record in order to assess potential impact son cetaceans, cetaceans (e.g. acoustic disturbance and entanglement). HWDT have maintained a catalogue of this information since 1990. In 2014 HWDT was commissioned to write a report on ghost gear and entanglement in cetaceans. The primary finding was that box packing straps are a source of entanglement in minke whales, particularly around the rostrum[43].

4.3 Reporting on anthropogenic noise

Most marine construction or development activities generating noise (e.g. piling) require the developer to apply for consent and carry out the necessary assessments e.g. Environmental Impact Assessments (EIA), Appropriate Assessments (AA) under the Habitats Directive[44]. The Marine Management Organisation (MMO) is responsible for marine licensing in English inshore and offshore waters and in Welsh and Northern Ireland

[39] Jepson et al, 2016.
[40] Losada, S., Barber, J.L., Bersuder, P., Uzyczak,J., Wilczynska, M., Deaville, R., Brownlow, A., Penrose, R., Jepson, P.D. and Law, R.J. PCDDs, PCDFs and dioxin-like CBs in harbour porpoises (Phocoena phocoena) stranded or bycaught in the UK during 2011-2012. [date and journal tbc, expected in 2017]
[41] http://randd.defra.gov.uk/Default.aspx?Menu=Menu&Module=More&Location=None&ProjectID=17835&FromSearch=Y&Publisher=1&SearchText=CSIP&SortString=ProjectCode&SortOrder=Asc&Paging=10#Description
[42] See Unger, B., Bravo Rebelledo, E.L., Deaville, R., Grone, A., Ijsseldijk, L.L., Leopold, M.F., Siebert, U., Spitz, J., Wohlsein, P. and Herr, H. (2016) Large amount of marine debris found in sperm whales stranded along the North Sea coast in early 2016. Marine Pollution Bulletin. DOI: 10.1016/j.marpolbul.2016.08.027
[43] Ryan, C., Froud, K., Harries, O., van Geel, N., Calderan, S. (2015). Is the cetacean community of Western Scotland changing? Presentation at the 29th Annual Conference of the European Cetacean Society, Malta, March 2015.
[44] See https://www.gov.uk/how-marine-licensing-works

offshore waters. BEIS (UK Department of Business, Energy and Industrial Strategy - formerly known as DECC) also has a regulatory responsibility for all UK waters in relation to the oil and gas sector and associated projects. In Scottish offshore and inshore waters Marine Scotland are the licensing body, in Welsh inshore waters it is Natural Resources Wales, and in Northern Ireland inshore waters it is the Department of Agriculture, Environment and Rural Affairs (DAERA).

Noise mitigation measures may be required where there is a risk that the activity may disturb or harm cetaceans, including the need for Marine Mammal Observers, soft start, and delay of piling activity when cetaceans are present. Relevant guidance can be found on the UK government website[45].

The MMO also has a voluntary notification system for non-Oil and –Gas geophysical surveys occurring in English waters, so that we have a record of these activities taking place and can make mitigation measures as appropriate[46].

Two Joint Nature Conservation Committee (JNCC) reports based on data from Marine Mammal Observer reports were published in 2015. The data covered 1,196 seismic surveys in UK and adjacent waters between 1994 and 2010. These reports built on earlier analysis of Marine Mammal Observer reports[47] , but allowed for longer term analysis of potential effects of seismic activities on cetaceans, as well as general trends in the implementation of the JNCC seismic guidelines throughout this time period[48]. The aim of the analysis covered in JNCC report 463a[49] was to identify any effects of seismic operations on marine mammals and any long term trends in compliance with the JNCC guidelines. This report also provides evidence to support the effectiveness of soft start procedures in minimising the effect of seismic surveys on cetaceans, where data was sufficient to test this aspect for individual species/ species groups. To accompany this report, a second report, JNCC report 463b[50], suggested recommendations for best practice for consideration in future revision to the guidelines. It highlights items for consideration; however, these suggestions do not represent JNCC's position on recommended revisions and do not constitute any changes to the current guidelines at present.

A full review of JNCC guidelines for minimising risks of injury and disturbance to marine mammals from seismic surveys began in 2015, building on the evidence presented in JNCC report 463b. Following on from this work a consultation on a revision to the JNCC seismic guidelines is expected in late 2016, with a revised publication expected in 2017.

The Marine Evidence Group published a report on pile driving and harbour porpoise 'An analysis of potential broad-scale impacts on harbour porpoise from proposed pile driving activities in the North Sea', which is available online[51].

A Scottish Government funded study on 'Tests of acoustic signals for aversive sound mitigation with harbour seals' was published in 2015[52]. The project focused mainly on harbour seals but it also made reference to mechanisms designed to minimise the risk of disturbing harbour porpoises and other sensitive cetaceans from anthropogenic activities that produce intense sound in the marine environment. The mitigation measures to

[45] https://www.gov.uk/oil-and-gas-offshore-environmental-legislation
[46] http://www.marinemanagement.org.uk/protecting/wildlife/geophysical.htm
[47] E.g. Stone, C.J. & Tasker, M.L. 2006. The effects of seismic airguns on cetaceans in UK waters. Journal of Cetacean Research and Management, 8(3), 255-263.
[48] https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/341146/msfd-part-2-final.pdf
[49] http://jncc.defra.gov.uk/page-6985
[50] http://jncc.defra.gov.uk/page-6986
[51] http://randd.defra.gov.uk/Default.aspx?enu=Menu&Module=More&Location=None&ProjectID=19403&FromSearch=Y&Publisher=1&SearchText=harbour%20porpoise&SortString=ProjectCode&SortOrder=Asc&Paging=10%20-%20Description
[52] http://www.smru.st-andrews.ac.uk/documents/scotgov/MR8-1_ADD_mitigation_VF2.pdf

minimise the risk of causing damage or injury are often a requirement when licences are issued to carry out risky activities in the marine environment. More information on this project can be found online.

The UK is also required to meet obligations on impulsive sounds and ambient noise under the Marine Strategy Framework Directive (MSFD). The UK has developed a noise registry that collates and stores records of activities that generate impulsive sounds in the UK marine environment. This will aid regulators and industry in providing a clear picture of the distribution in space and time of impulsive noise generating activities and help the UK to assess whether it is delivering Good Environmental Status (GES).

The UK also continues to actively engage more widely on noise issues within Europe. The UK is currently the Chair of OSPAR's (Oslo and Paris Conventions for the protection of the marine environment of the North-East Atlantic) Biodiversity Committee (BDC) which considers cetaceans more generally. The UK also plays an active role in the ICG-MSFD (Intersessional Correspondence Group for MSFD) which helps improve regional MSFD coordination and in the EIHA (Environmental Impacts of Human Activities) Committee which considers the impacts of marine noise. Additionally, The UK Underwater Sound Forum continues to provide an opportunity for industry, government and non-government organisations and other interested stakeholders to engage directly with Defra, BEIS, and Ministry of Defence (MoD) to discuss emerging issues and exchange information on the impacts of noise in the marine environment. Furthermore, marine plans are being developed across the UK (all areas should be covered by 2021) which are expected to provide guidance on managing noisy activities. The UK also co-chairs the European Union's Technical Group on Noise.

UK scientists also conducted a study to investigate the effectiveness of Marine Mammal Observers in enabling mitigating measures to be implemented to reduce the risk of injury from loud sound sources. The results provide a simple method for case specific assessment of the extent to which MMOs can contribute to risk reduction[53].

4.4 Reporting of cetacean strandings in the UK

Since 1990, the collaborative UK Cetacean Strandings Investigation Programme[54] (CSIP) has been funded by UK Government (currently through Defra, Scottish Government and Welsh Government) to collate analyse and report data for all cetacean, marine turtle and basking shark strandings around the coast of the UK. The CSIP determines the causes of death in stranded cetaceans, including bycatch and other anthropogenic drivers of mortality and undertakes surveillance on the incidence of disease in stranded cetaceans in order to identify any substantial new threats to their conservation status.

The CSIP holds data on over 13700 cetaceans, which were reported stranded around the UK between January 1990 and September 2016. In addition, detailed pathological data are also held on over 3740UK stranded cetaceans, which were necropsied by the CSIP during the same period. Data collected on strandings and during necropsies are routinely recorded in a web-accessed relational database[55]. A proportion of data held on this system is also made available to the public via a Defra funded portal, the NBN gateway[56].

Annual reports from the programme which provide detailed information on strandings in the UK can be found on the UK government web site[57]. Please note that there is a period of delay whilst data for the preceding year

[53] See Leaper, R., S. Calderan and J. Cooke (2015). A simulation framework to evaluate the efficiency of using visual observers to reduce the risk of injury from loud sound sources. Aquatic Mammals 41(4): 375-387.; *and* Graham, I.M., Cheney, B., Hewitt, R.C., Hastie, G.D. and Thompson, P.M. 2015. Strategic Regional Pre-Construction Marine Mammal Monitoring Programme Annual Report 2015. Available at:
http://www.abdn.ac.uk/lighthouse/documents/Project_Reports/MMMP_Annual_Report_2015.pdf
[54] www.ukstrandings.org
[55] http://data.ukstrandings.org
[56] www.nbn.org.uk/
[57]http://randd.defra.gov.uk/Default.aspx?Menu=Menu&Module=More&Location=None&ProjectID=17835&FromSearch=Y&Publisher=1&SearchText=CSIP&SortString=ProjectCode&SortOrder=Asc&Paging=10#Description

are compiled.

A project is also in place to provide Scottish context for cetacean strandings (the Scottish Marine Animal Strandings Scheme (SMASS)[58]). This builds on the wider UK Cetacean Strandings Investigation Programme (CSIP) by providing a systematic and coordinated approach to the surveillance of marine animal strandings in Scotland.

The Irish Whale and Dolphin Group (IWDG) have coordinated a stranding scheme (supported by the Department of Arts, Heritage and the Gaeltacht in Ireland) and maintained a publically available stranding database for the whole island of Ireland since 1991. Strandings are reported via the online reporting form or via email. Any genetic tissue that is collected is stored in a central storage facility at the National Museum of Ireland-Natural History (NMINH) in Dublin. The Department of Agriculture, Environment and Rural Affairs (DAERA) Marine Division also record cetacean strandings along the Northern Irish coast. Any stranding records submitted directly to the IWDG are forwarded to the DAERA Marine Division and vice versa.

4.5 Reporting on the impacts of shipping

The UK is a Contracting Government to the International Maritime Organization (IMO) and the Convention on Migratory Species and its Agreements ASCOBANS[59] and ACCOBAMS[60]. Work relating to ship strikes in the UK is undertaken in cooperation with the IMO, ACCOBAMS and ASCOBANS in addition to the International Whaling Commission (IWC).

The UK has established a coordination process with NGOs, scientists and other relevant bodies to improve cooperation and reporting to the IWC on matters relating to ship strikes. In addition to on-going work in the UK, UK NGOs and scientists have been active in addressing ship strike threats in other parts of the world including the Bay of Biscay, Hellenic Trench Greece and Sri Lanka.

UK scientists contributed to a paper presented by the IWC to the IMO's Marine Environment Protection Committee in 2016, and provide ongoing support to IWC Secretariat on ship strike related issues.

IMO Polar Code

The IMO Polar Code contains a chapter on Voyage Planning. This requires that 'the master shall consider a route through polar waters taking into account' the 'current information and measures to be taken when marine mammals are encountered relating to known areas with densities of marine mammals including seasonal migration areas'. This measure could require vessels to select routes that minimise ship strike risk in areas where there are particular concerns.

The UK has been a strong supporter of the Polar Code and remains particularly concerned with the preservation of the unique environments at both poles. We continue to support the inclusion of measures to ensure routes are calculated taking account of marine mammals and expect vessels to include such considerations in any application through the UK for a license to enter and operate in the region.

UK Cetacean Strandings Investigation Programme (CSIP)

Information on dead cetaceans found stranded around the UK coast or floating dead at sea is reported to the UK CSIP. During the course of this programme, the CSIP has recorded cases of ship strike in numerous species of both large and small cetaceans.

During 2014, 115 UK stranded cetaceans were examined at post-mortem by the CSIP. Of these, two were diagnosed as ship strikes, comprising short-beaked common dolphin (n=1) and sperm whale (n=1). During 2015, 115 UK stranded cetaceans were examined at post-mortem by the CSIP. Of these, three were diagnosed as ship strikes, comprising short-beaked common dolphin (n=1), Risso's dolphin (n=1) and fin whale (n=1). Observed pathology was characterised by large areas of dorsal and/or lateral musculature haemorrhage,

[58] http://www.strandings.org/
[59] ASCOBANS: Agreement on the Conservation of Small Cetaceans in the Baltic, North East Atlantic, Irish and North Seas
[60] ACCOBAMS: Agreement on the Conservation of Cetaceans in the Black Sea Mediterranean Sea and Contiguous Atlantic Area

consistent with blunt impact and/or parallel linear incisions in the body wall, consistent with impact from outboard propeller blades (e.g. Deaville *et al.* 2013)[61]. On 14th June 2015 a dead fin whale was brought into Harwich harbour on the front of a cargo vessel. The whale was too decomposed to allow a full post-mortem examination, but the CSIP collected data and conducted basic sampling.

Further details on these cases can be found in the 2014 and 2015 CSIP annual reports to UK government[62].

Sri Lanka

Scientists from the UK (Universities of St Andrews and Aberdeen) collaborated with researchers in Sri Lanka studying the distribution patterns of blue whales off southern Sri Lanka. Funding for the work came from the Biosphere Foundation, Raja and the Whales, and International Fund for Animal Welfare (IFAW). Results from this study have now been published suggest a 95% risk reduction if shipping were to transit 15nm further offshore[63].

The IMO MEPC noted in 2016 that such small routing changes are the most effective way of reducing ship strike risk. In 2016 the IWC Scientific Committee agreed that the combined results of the studies that had been conducted were sufficiently consistent to support a proposal to IMO to move the shipping lanes should Sri Lanka so wish.

The NGO ORCA's Ship Strike Programme and the Bay of Biscay

The Bay of Biscay is an area of high density maritime traffic combined with high densities of large whales, particularly in summer. A workshop held in April 2012, funded by World Animal Protection, focused on reducing ship strike risk in the Bay of Biscay, with key stakeholders participating. The objective was to build collaboration between scientists, industry, policy makers and NGOs to find ways to reduce the risk of ship strikes on large cetaceans. The workshop focused on pragmatic and realistic solutions that industry could adopt.

The workshop identified that bridge crews were largely unaware of where high risk areas of ship strike were, when they were travelling through the Bay of Biscay. Progress since the workshop includes the production of an information pack[64] which has been distributed to shipping companies. In addition, the UK Chamber of Shipping established an industry based ship strike working group to help raise awareness. ORCA is working with the shipping companies to improve the uptake.

Another key objective identified from the workshop was the need for the development of an early warning system to be used by industry. This would be based on near real time ship to ship reporting of whale sightings to highlight risk zones. Working in collaboration with Souffleurs d'Ecume the early warning system REPCET was reviewed for application in the Bay Biscay. However, for such a system to be effective in the Bay there needs to be a better understanding of how the large whales (particularly Fin Whales) are utilising the Bay and how the number of sightings on a transit compares to what would be expected for the conditions and time of year.

For six months of each year, ORCA's wildlife officers and survey teams transit the inner Bay of Biscay on board ferries, monitoring sightings of large whales. This information along with a re-activated European Cetacean Monitoring Coalition (consisting of eight European NGOs, including the Bay of Biscay Range States) and an agreed European cetacean data dictionary is providing a better understanding of cetacean abundance in the Inner Bay of Biscay.

To help increase knowledge of the density of large whale populations in the outer bay, ORCA is liaising with

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[61] Deaville, R., Brownlow, A., Penrose, P., Smith, B., Barnett, J., Perkins M. and Jepson, P. (2013) Turning the screw: ship strike in UK stranded cetaceans *Proceedings of the 27th annual conference of the European Cetacean Society, Setubal, Portugal, 8th-10th April 2013*.

[62] http://randd.defra.gov.uk/Default.aspx?Menu=Menu&Module=More&Location=None&ProjectID=17835&FromSearch=Y&Publisher=1&SearchText=strandings&SortString=ProjectCode&SortOrder=Asc&Paging=10#Description.

[63] Priyadarshana, T., Randage, S.M., Alling, A., Calderan, S., Gordon, J., Leaper, R., Porter, L. 2016. Distribution patterns of blue whale (Balaenoptera musculus) and shipping off southern Sri Lanka. Regional Studies in Marine Science 3:181-188, http://dx.doi.org/10.1016/j.rsma.2015.08.002

[64] http://www.orcaweb.org.uk/uploads/Our_Work/ORCA_STRIKE-TOOLKIT-ONLINE.pdf

shipping companies whose vessels frequent the outer shipping lanes with the objective of placing trained surveyor teams on vessels.

In the meantime with continued collaboration with the French NGO Souffleurs d'Ecume, modifications to the REPCET software have been made to ensure that reports of ship strikes are automatically uploaded to the International Whaling Commission's global ship strike database, to assist with more accurate estimates of mortality and injuries and enable better modelling of risk factors and avoidance measures.

5. Whale Watching

Whale and dolphin watching around the UK coast has increased dramatically in the past 20 years, as both commercial ventures are set up and the public has started to take an interest in watching the animals in their natural habitat. In the UK, several codes of conduct and accreditation schemes are in place aimed both at the public in general and at commercial wildlife watching operators. Wildlife Trusts across the UK often have in place guidance for wildlife watching. Adherence to these codes of practice should, in principle, reduce the risk of injury and disturbance however their effectiveness in terms of compliance and protection requires further monitoring.

England
The Marine Management Organisation (MMO) is the enforcing body in English waters for wildlife legislation, and their remit includes disturbance offences. Educational training, focussing on legislation and offences, has been carried out by the MMO around the coast in areas where disturbance activities are an issue. Enforcement action for disturbance offences can be taken by police or MMO where evidence allows.

The MMO is part of the Cornwall Marine Wildlife Group which has established a disturbance register so incidents in the South West of England can be reported and recorded as well as being forwarded to the relevant enforcement authorities as necessary (the Police and MMO). A coastal code of conduct to reduce disturbance of coastal and marine species has also been created[65] alongside specific guidance for avoiding disturbance of cetaceans[66].

Scotland
In November 2006, The Scottish Marine Wildlife Watching Code (SMMWC) was launched as a result of the Nature Conservation (Scotland) Act 2004. This code was developed by Scottish Natural Heritage (SNH) for those who watch marine wildlife in Scotland - whether from the shore or at sea. The code comprises recommendations, advice and information. The Scottish Code and its guidance have been incorporated into the WiSe[67] (**Wi**ldlife **S**af**e**) courses, a UK wide training and accreditation scheme aimed at operators of passenger pleasure craft, wildlife cruise operators, dive boats and charter yachts who may come into contact with large marine wildlife such as whales, dolphins, basking sharks or seals. The countries' nature conservation agencies (NE, CCW (now NRW), SNH and NIEA) advise compliance with this scheme.

A further set of guidelines, specific to the Moray Firth area, are in place as part of the Dolphin Space Programme (DSP), an accreditation scheme for wildlife tour boat operators in that area. The aim of the DSP is to encourage people observing dolphins and other marine wildlife to "watch how they watch" and to respect the animals' need for space. The mission of the DSP is to be a model of excellence in responsible wildlife tourism and is intended to support the sustainable, positive development of marine wildlife watching in the area.

[65] http://www.cornwallwildlifetrust.org.uk/livingseas/cornwall_marine_and_coastal_code
[66]http://www.cornwallwildlifetrust.org.uk/livingseas/cornwall_marine_and_coastal_code/dolphins_porpoises_and_whales
[67] www.wisescheme.org

Additionally, the Aberdeen Harbour Board, East Grampian Coastal Partnership, Police Scotland and Scottish Natural Heritage have developed the Code of Practice with advice from WDC in order to protect a resident pod of bottlenose dolphins regularly found around the converging currents at the mouth of the busy harbour[68].

Wales
Ceredigion County Council's dolphin and boat monitoring includes the monitoring of wildlife watching trips. The Council are very proactive and have a meeting with the boat operators at the beginning of each season to agree the code of conduct. This is a voluntary scheme that results in almost 100% compliance from the wildlife watching boats and about 98% compliance from other boat users. NRW [formerly CCW] advises widely on wildlife watching endeavours and advocates (and collaborated on the development of) the WiSe scheme or similar, promotes a variety of codes of conduct including the Sea Wise code (NRW's standard code) and strictly licenses certain activities such as Photo ID licences for cetacean research.

Northern Ireland
The Northern Ireland Environment Agency actively supports the WiSe Scheme and has facilitated three separate workshops for commercial and leisure operators since 2005. Recent funding enabled the training of two local WiSe Instructors in Northern Ireland, one for Co Antrim and Derry (north coast) and another for County Down (east coast). The scheme focuses on cetaceans, in addition to seals, basking sharks, and seabirds.

6. Other relevant information

Outreach
Whale and Dolphin Conservation (WDC) reached out to more than 100,000 people through its Wildlife Centres and Shorewatch volunteer programme in Scotland. 5,000 children participated in WDC's education programme, also based in Scotland.

The IWDG has continued to raise awareness and increase knowledge on cetaceans in Northern Irish waters through its casual and dedicated land based monitoring scheme, annual Whale Watch Ireland event and attendance at local maritime festivals. Additionally, IWDG held a Wildlife-Watching training day in the Ulster Folk and Transport Museum on the 11th April 2015 in collaboration with the Centre for Environmental Data and Recording (CEDAR) and a cetacean identification training day in Whitehead on the 6th February 2016.

Sea Watch Foundation has continued to organise an annual National Whale and Dolphin Watch week, comprising dedicated effort-based watches from both land and vessels around the British Isles from Shetland to the Isle of Scilly and Channel Islands[69]. Additionally Sea Watch also continued to run a Dolphin Adoption scheme aimed particularly at children, to encourage them to get directly involved with the conservation of photo-identified individual dolphins. Sea Watch also maintains a national observer network around the British Isles as part of its long-standing citizen science programme, with effort-related shore watches, offshore surveys (for which dedicated recording apps have been developed), and the reporting of casual sightings via an on-line recording template that is linked to a database.

The Cetacean Strandings Investigation Programme (CSIP) (funded by Defra and the Devolved Administrations of Scotland and Wales) run a variety of outreach activities each year which seek to raise awareness of issues relating to cetaceans, including both cetacean health and strandings. CSIP staff from the Zoological Society of London (ZSL) ran a strandings exhibit at 'Sunset Safari' at ZSL in July 2015 and July 2016. CSIP staff from the Natural History Museum (NHM) and ZSL helped run an exhibit on UK strandings/cetaceans at 'Science Uncovered' at the NHM in September 2015. The CSIP also took part in strandings related presentations and exhibits at the Cheltenham Science Festival in June 2016 and the British Science Festival in Swansea in September 2016. Skeletal material, fixed material and parasites were on display at each event, along with video footage of necropsies carried out at ZSL.

[68] http://www.marinecode.org/ and http://uk.whales.org/news/2015/02/new-code-launched-to-protect-dolphins-in-aberdeen
[69] See http://www.seawatchfoundation.org.uk/wp-content/uploads/2016/02/NWDW2015.pdf

The work of the CSIP in the UK has also been publicised during the intersessional period between IWC65 and IWC66 through numerous presentations, demonstration necropsies and social media activity by CSIP staff[70].

The Scottish Marine Animal Strandings Scheme (SMASS) Volunteer Outreach Programme continues to develop. It seeks to encourage the reporting of strandings, and also the availability of strandings data to both the scientific community and members of the public. This has involved running a succession of volunteer training courses with the aim of providing the SMASS with a network of trained volunteers able to visit strandings and accurately collect photos, data and samples from animals not deemed suitable for collection and necropsy. The SMASS also seeks to foster closer links between the UK and other non-UK schemes. For example, in June 2015 UK CSIP, SMASS and staff at Edinburgh University met up with the Dutch Stranding scheme with the aims of revising the European necropsy procedure and fostering closer links between the UK and Dutch Schemes. This resulted in the presentation of a paper at ICES in Copenhagen, Denmark on 24/09/2015[71].

The HWDT runs a series of outreach and education programmes in isolated coastal communities, including on cetacean diversity, conservation issues and training on species identification to encourage participation in the Trust's Community Sightings Network. In 2015 the programme also engaged with schools across the Inner Hebrides (Mull, Islay, Colonsay, Tiree, Coll, Rum, Eigg, Easdale), Outer Hebrides (Barra, the Uists and Harris) and the west coast mainland (Oban, Fort William, Mallaig, Ullapool).

[70] http://www.facebook.com/pages/Cetacean-Strandings-Investigation-Programme-UK-strandings/142706582438320
[71] Mariel ten Doeschate, Andrew Brownlow, Nick Davison, Rob Deaville, Paul Jepson, Graham Pierce, Fiona Read, Paul Thompson. "The pathology of strandings data: methods to improve the ecological value of the strandings record as a monitoring tool". ICES Conference, Copenhagen, Denmark on 24/09/2015.