

Agenda Item 3.1.1

Review of New Information on Threats to Small
Cetaceans

Bycatch

Report and Recommendations of the
Working Group

Document 3.1.1.b rev.1

**Draft OSPAR Marine Mammal
Indicators**

Action Requested

- Take note
- Comment

Submitted by

Bycatch Working Group



**NOTE:
DELEGATES ARE KINDLY REMINDED TO BRING THEIR OWN COPIES OF DOCUMENTS
TO THE MEETING**

Secretariat's Note

The attached documents were submitted through the Bycatch Working Group for the Advisory Committee's information. They have not yet been reviewed by the Bycatch Working Group.

The attached documents are drafts of the marine mammal indicators being prepared by OSPAR, a regional seas convention assisting in the implementation and coordination of monitoring of the EU Marine Strategy Framework Directive.

An older draft had been submitted to the OSPAR Biodiversity Committee meeting in February 2013, and was further elaborated by ICES during the ICES Working Group on Marine Mammal Ecology (WGMME) that met from 4-7 February 2013.

The versions attached are the ones originating from the ICES WGMME meeting, and they will be further discussed by national experts in the OSPAR Coordination of Biodiversity Assessment and Monitoring (COBAM) project, and at the OSPAR COBAM meeting taking place in Gothenburg 11-12 September 2013.

Any comments or additional information regarding these indicator summaries are welcome.

PART C: Technical specification of proposed common biodiversity indicators

Mammals

Code	Previous code*	Indicator	Category
M-1	31&33	Distributional range and pattern of grey and harbour seal breeding and haul-out sites, respectively	Core
M-2	32&34	Distributional range and pattern of cetaceans species regularly present	Core
M-3	35	Abundance of grey and harbour seal at breeding and haul-out sites, respectively	Core
M-4	36	Abundance at the relevant temporal scale of cetacean species regularly present	Core
M-5	37	Grey seal pup production	Core
M-6	38&39	Numbers of individuals within species being bycaught in relation to population	Core

[Draft OSPAR Common Indicators: marine mammals \(M-2\)](#)

[Distributional range and pattern of cetacean species regularly present](#)

1. Indicator

“Distributional range and distributional pattern within range of cetacean species regularly present”.

The cetacean species for use as a core indicator under OSPAR are limited to the following species:

- *harbour porpoise*
- *bottlenose dolphin*
- *white-beaked dolphin*
- *minke whale*
- *common dolphin*

Common dolphin are considered representative of the wider European waters (i.e. both off and on the continental shelf). It should also be noted that bottlenose dolphins can be divided into two types. There are well known small resident coastal groups (possibly to be divided into different Management Units) and groups, comprising much more animals, that are wide-ranging both inshore and offshore (‘oceanic’ population).

2. Reasoning for the development of this indicator

Marine mammals, including cetaceans, are top predators, and comprise an important part of biodiversity (Descriptor 1). As all cetacean species are taken up under the Habitats Directive (annex IV and/or II), their distribution comprises a key aspect for securing and achieving GES according to the MSFD.

With the possible exception of some coastal bottlenose dolphin populations, cetaceans are generally mobile over large spatial and temporal scales. For example, there was a significant southerly shift in the North Sea harbour porpoise population between the two SCANS surveys (1994 and 2005). Assessments

therefore need to be undertaken at an appropriate scale and it should be noted that expansions in range are far easier to detect than contractions. A good understanding of natural movement patterns (e.g. seasonal patterns) is required prior to any deterioration or expansion being detected and links made with anthropogenic activities.

Because of the scale required for assessments, a transboundary approach to the collection, collation and analysis of data will be required. Such an approach has also been suggested for Favourable Conservation Status assessments for the Habitats Directive.

Number of CPs reporting/using the indicator (n=9) : 8

Consensus among CPs on usefulness as part of a region wide set (n=8): 8

3. Parameter/metric

“Distributional range of cetacean species regularly present and distributional pattern at the relevant temporal scale of cetacean species regularly present.”

There is a very clear overlap between distributional range and distributional pattern within range. The same monitoring will be used to undertake both analyses. An assessment of distribution, including trends over time, is required as part of the Favourable Conservation Status (FCS) assessments for the Habitats Directive (as short term and long term trends)¹.

4. Baseline and reference level

Although the baseline should be based on historical data, these are not available at the appropriate spatial and temporal scale. Moreover, the historical distributional range and pattern of many cetacean species cannot realistically be restored (assuming it has contracted, which is unknown for many species) as today's marine environment is very different. Climatic changes may have important consequences. For the harbour porpoise, there have been important distributional shifts in the North Sea during the last decades. For the coastal bottlenose dolphin, many populations are small, and some estuaries that historically contained populations no longer do so (e.g. Humber and Thames Estuaries, UK); in other locations (e.g. the Sado Estuary, Portugal), populations are endangered. The relationship between inshore and 'oceanic' populations is not well known, and the much larger 'oceanic' populations are relatively poorly known.

White beaked dolphins occur over a large part of the European continental shelf, including the North Sea, but are rare in the Irish Sea, Celtic Sea, Channel and Bay of Biscay, and around the Iberian Peninsula.

Minke whales are widely distributed in European shelf waters, particularly along the Atlantic seaboard and in the northern and central North Sea.

For common dolphins, there are large seasonal movements in the population on and off the continental shelf, whilst in some areas the possibility of 'inshore' and 'offshore' populations has been suggested. For this species, as with bottlenose dolphin, it is essential that assessments include consideration of the species off the continental shelf.

¹ In the 2007 FCS assessments, this was undertaken on a country by country basis which led to an unsatisfactory standard of assessment at the European North Atlantic scale (ICES, 2009). For the 2013 FCS assessments, a greater emphasis has been placed on the need for a transboundary approach (European Commission, 2011), although it seems unlikely that this will occur.

5. Target setting

The proposed target is *“Maintain populations in a healthy state, with no decrease in population distribution with regard to the baseline (beyond natural variability) and restore populations, where deteriorated due to anthropogenic influences, to a healthy state”*. Some difficulties can be encountered here, because there is usually no straightforward link between the distributional range and pattern, and human activities. Although the baseline for each species considered should be based on historical data, these are generally not available at the appropriate spatial and temporal scale.

6. Spatial scope

The geographical scope of the indicator is species dependent. With the exception of coastal bottlenose dolphin populations, cetacean populations cover large spatial scales often extending beyond European North Atlantic waters for example. Assessments therefore need to be undertaken at an appropriate scale and a good understanding of natural variability and patterns of movement is required prior to any change of distribution being detected and links made with anthropogenic activities. Management Units for cetacean species, also to be used in indicator M-4 (Abundance) and M-6 (bycatch) assessments, have been loosely defined by ASCOBANS (Evans & Teilmann, 2009), reviewed by WGMME (2012) and further refined by WGMME (2013; see Appendix 1).

7. Monitoring requirements

The objective of the monitoring should be to detect trends, in particular negative ones, in the distributional range and pattern, due to human pressures. Human pressures are diverse: some human activities remove individuals directly from the population (e.g. bycatch). Other pressures degrade condition and health of animals (e.g. contaminants, food depletion), or displace populations towards habitats of poorer quality (disturbance by noise, habitat modification). Monitoring is undertaken through a variety of approaches and by many different organisations. There are large scale international surveys such as SCANS and CODA, annual national surveys that occur in the waters of some Member States and, at a more localised scale, and there are various surveys undertaken by the state, academic institutions and/or non-governmental organisations. Although these surveys are mostly dedicated to provide for density estimation, they also yield information about distribution and distributional patterns.

Strandings data represent to date the most extensive and long-term source of demographic data for a number of cetacean populations (at least in areas where strandings occur). Strandings data are currently clearly underexploited and rarely analysed at an international level. They could yield useful complementary information to identify possible anthropogenic impacts, and can contribute to the identification of possibly underlying reasons for trends in the distributional range and pattern of cetaceans. Coverage needs to be reliable, and biological and pathological investigations need to be standardised.

The monitoring and assessment undertaken for distributional range and pattern of cetaceans, will be made in combination with indicator M-4 (abundance).

8. Appropriateness of the indicator

In most cases it is difficult to find a straightforward link between the range and the distribution pattern of cetaceans and human activities. There are multiple pressures, and climate change is also a factor influencing abundance and distribution. However, as top predators and being charismatic animals of general public concern, changes in distribution and abundance are important, and should be assessed against changes in human activities and climate change to detect cause-effect relationships and, where necessary

followed by the appropriate management measures.

9. Reporting

Given that populations have a transboundary distribution (except for the resident and most coastal bottlenose dolphins groups) agreements have to be made on monitoring and reporting in order to be able to make an assessment. The reporting frequency should follow the monitoring frequency, and the assessment for most species should be made every 6 years. For the small cetaceans it is proposed that ICES makes the assessment, while for the minke whale a regular assessment of the north-east Atlantic population is made by the IWC.

10. Costs

Monitoring distribution and distributional range of cetacean can range from fairly cheap (monitoring of an inshore population with a limited range) to very expensive (monitoring of an offshore population distributed over a large area); however, part of the monitoring is in place (in a combination of indicator M-2, M-4 and M-6), while new resources are needed, e.g. for large scale decadal surveys and more comprehensive annual surveillance (see also indicator M-4).

11. Further work

Future steps are similar as for the indicator M-4 (abundance).

- 1) Compilation of existing data on the distributional range;
- 2) Development of a baseline for each species;
- 3) Development of a method to extract data on distribution and distributional pattern from the data obtained from the monitoring for indicator M-4;
- 4) Development of, and agreement on, a standardized reporting and assessment method;
- 5) For small cetaceans, agreement on the body that provides for the assessments.

Literature

- European Commission, 2011. Assessment and reporting under Article 17 of the Habitats Directive Explanatory Notes & Guidelines for the period 2007-2012. Available at: http://circa.europa.eu/Public/irc/env/monnat/library?l=/habitats_reporting/reporting_2007-2012/reporting_guidelines&vm=detailed&sb=Title
- Evans, P.G.H. & Teilmann, J., 2009. ASCOBANS/HELCOM Small Cetacean Population Structure Workshop. ASCOBANS, Bonn, Germany, 141 pp.
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- Paxton, C.G.M. , M. Mackenzie, M.L Burt, E. Rexstad & Thomas, L., 2011. Phase II Data Analysis of Joint Cetacean Protocol Data Resource. Report to Joint Nature Conservation Committee, Contract number C11-0207-0421. Available at: http://jncc.defra.gov.uk/pdf/JCP_Phase_II_report.pdf
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- Thomas, L., 2009. Potential Use of Joint Cetacean Protocol Data for Determining Changes in Species'

Range and Abundance: Exploratory Analysis of Southern Irish Sea Data. Available at:
http://jncc.defra.gov.uk/pdf/JCP_Prelim_Analysis.pdf

Appendix 1: Management Units

WGMME (2013) recommended that Member States use the following management units for reporting requirements of the Habitats Directive and for the development of indicators and their assessment for the Marine Strategy Framework Directive.

There is a single MU in the European North Atlantic for common dolphin (*Delphinus delphis*), white-beaked dolphin (*Lagenorhynchus albirostris*), white-sided dolphin (*Lagenorhynchus acutus*), striped dolphin (*Stenella coeruleoalba*) and minke whale (*Balaenoptera acutorostrata*).

For harbour porpoise (*Phocoena phocoena*), MUs are proposed for the Iberian Peninsula, Celtic Sea, Irish Sea, West Scotland/NW Ireland, the North Sea and Inner Danish Waters (Figure 1). More than one MU in the North Sea for harbour porpoise should be explored in ongoing work to develop management models for setting safe limits to bycatch.

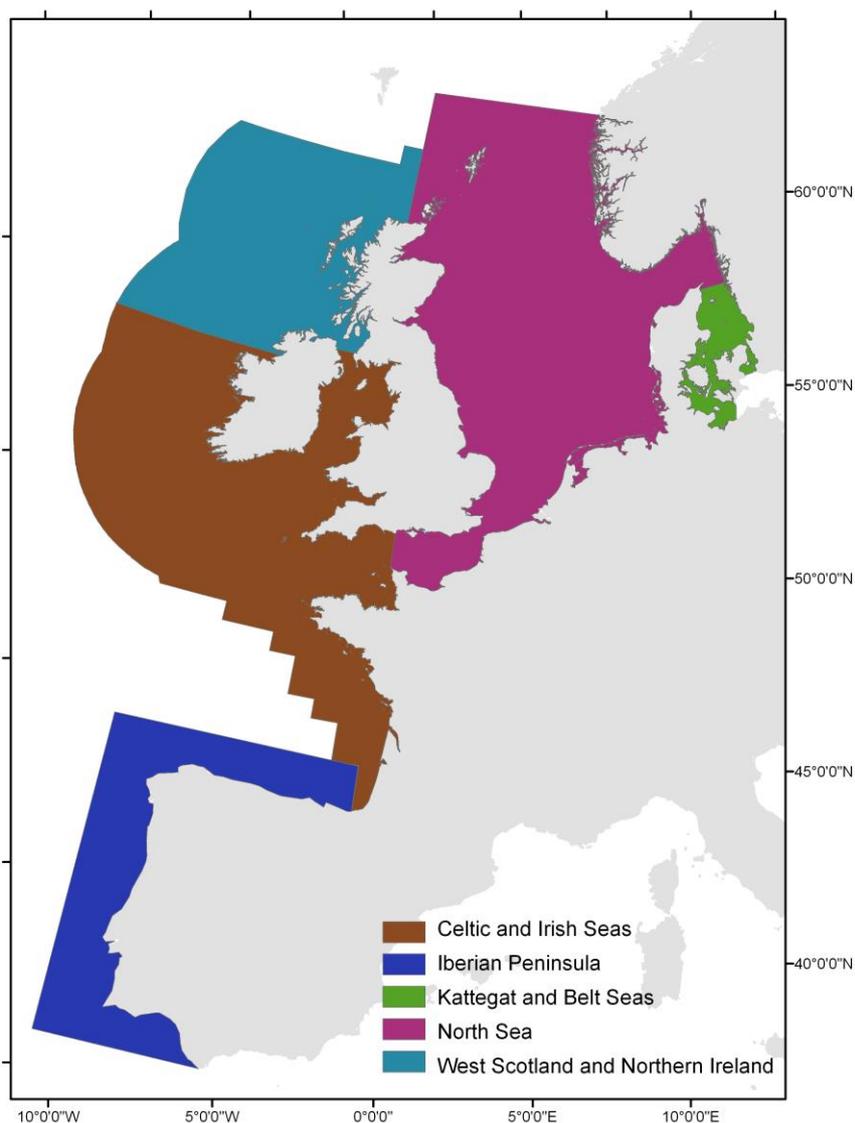


Figure 1: Harbor porpoise management units

Bottlenose dolphins have a complex population structure, with three types being recognized: very small residential groups, slightly wider ranging resident coastal groups and the oceanic group. The following Management Units are proposed (given from north to south; Figure 2):

Resident groups: Barra (Scotland); Shannon Estuary (Ireland); Ile de Sein and Archipel de Molene (France); Galician rias (Spain); Sado Estuary (Portugal).

Coastal groups: east coast of Scotland (UK); Inner Hebrides (UK); Irish Sea (Ireland and UK); Connemara-Mayo (northern and western coasts of Ireland); southern coast of Ireland; the coastal English Channel/Celtic Sea (UK); northern coast of France, northern coast of Spain; Galicia (Spain); coast of Portugal; the Azores (Portugal), Gulf of Cadiz (southern coast of Spain) and Strait of Gibraltar (southern coast of Spain).

Oceanic waters: a single MU for all continental shelf/slopes/oceanic waters outside 12nm from the coast. It should be noted that although this MU extends into the North Sea (represented by ICES Area IV, excluding coastal east Scotland) and that very few bottlenose dolphin are seen in this area and, although there is no conclusive evidence, those seen are thought to belong to the Coastal Scottish group.

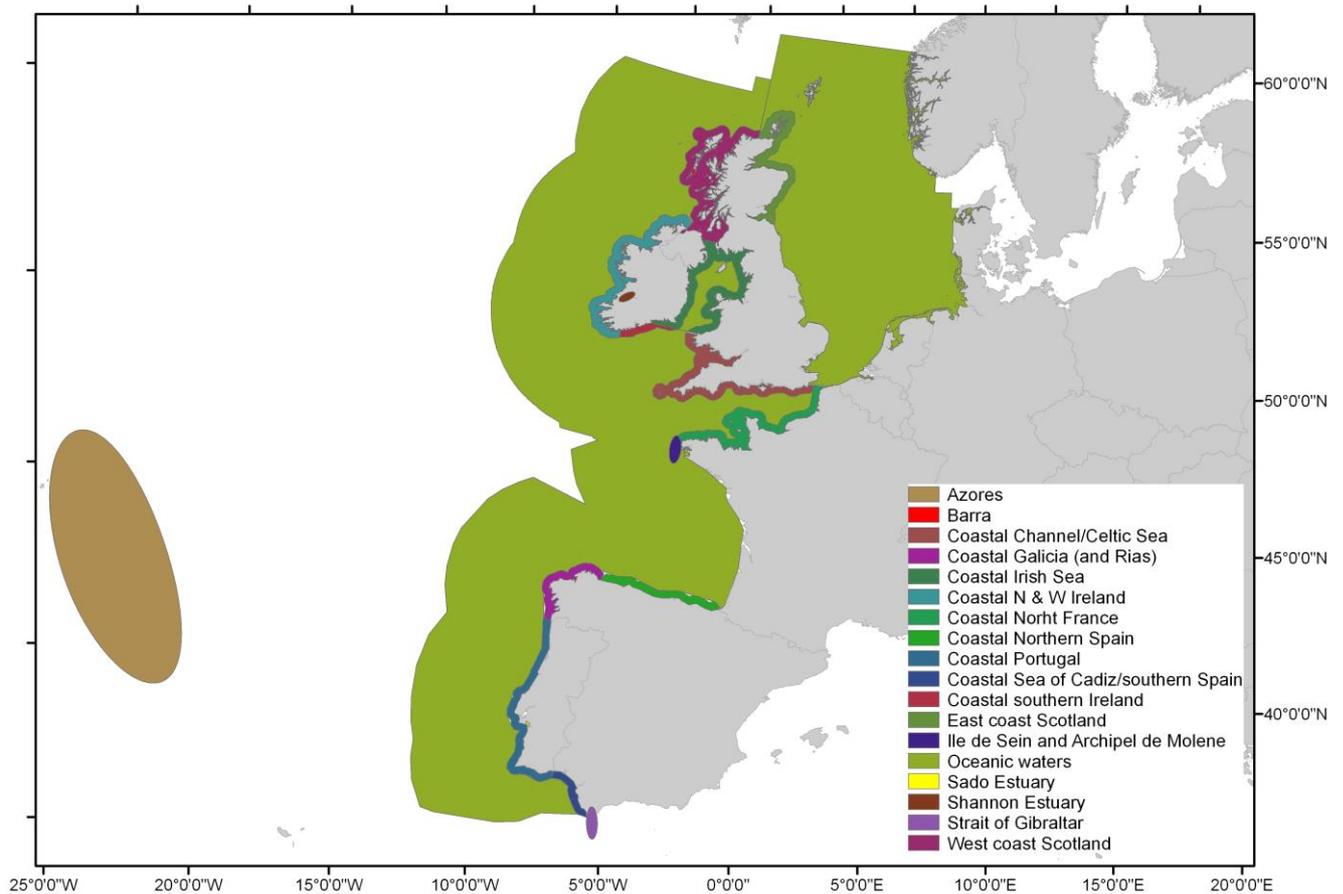


Figure 2: Bottlenose dolphin management units.

PART C: Technical specification of proposed common biodiversity indicators

Mammals

Code	Previous code*	Indicator	Category
M-1	31&33	Distributional range and pattern of grey and harbour seal haul-outs and breeding colonies	Core
M-2	32&34	Distributional range and pattern of cetaceans species regularly present	Core
M-3	35	Abundance of grey and harbour seal at haul-out sites & within breeding colonies	Core
M-4	36	Abundance at the relevant temporal scale of cetacean species regularly present	Core
M-5	37	Harbour seal and Grey seal pup production	Core
M-6	38&39	Numbers of individuals within species being bycaught in relation to population	Core

Draft OSPAR Common Indicators: marine mammals (M-4)

Abundance at the relevant temporal scale of cetacean species regularly present

1. Indicator

“Abundance, at the relevant temporal scale, of cetacean species regularly present”.

The cetacean species for use as a core indicator under OSPAR are limited to the following species:

- harbour porpoise
- bottlenose dolphin
- white-beaked dolphin
- minke whale
- common dolphin

Common dolphin are considered representative of the wider European waters (i.e. both off and on the continental shelf). It should also be noted that bottlenose dolphins can be divided into two types. There are well known small resident coastal groups (possibly to be divided into different Management Units) and groups, comprising much more animals, that are wide ranging both inshore and offshore (‘oceanic’ population).

2. Reasoning for the development of this indicator

Marine mammals, including cetaceans, are top predators, and comprise an important part of biodiversity (Descriptor 1). As cetaceans are taken up under the Habitats Directive (annex IV), their abundance (criterion 1.2.) comprises a key aspect for securing and achieving GES according to the MSFD. However, as it is not feasible to monitor all cetaceans, which include uncommon, widely-dispersed and oceanic species, the indicator is limited to the population size of Management Units (MUs) of a number of shelf species for which

objectives were set or measures proposed in the framework of OSPAR, ASCOBANS, EC fishery regulations and the Habitats Directive (Annex II).

The monitoring and assessment of the indicator is partly in place, with monitoring already required under the Habitats Directive and fisheries legislation (Regulation 812/2004 and Data Collection Regulation).

Number of CPs reporting/using the indicator (n=9) : 8

Consensus among CPs on usefulness as part of a region wide set (n=8): 8

3. Parameter/metric

“Abundance of cetacean species regularly present (at the relevant temporal and spatial scale)”.

The same monitoring used to assess changes in cetacean abundance will be used to assess changes in distribution (M-2). An assessment of abundance, including trends over time, is required as part of the Favourable Conservation Status (FCS) assessments for the Habitats Directive¹.

4. Baseline and reference level

Although the baseline should derive from historical (i.e. pre-1900) data, these are not available at the appropriate spatial and temporal scale. Moreover, the historical abundance of many cetacean species is unknown and cannot realistically be restored (where it is known to have declined) as today's marine environment is very different. Climatic changes may have important consequences. A modern baseline has to be utilised for the species considered.. However, abundance estimates typically have wide confidence values, and may not have the power to detect a statistically significant trend. Therefore, abundance data should always be considered with any available data on distributional changes, causes of death in stranded animals and possible links with human activities.

5. Target setting

A general proposed target for all species is: *“Maintain populations in a healthy state, with no decrease in population size with regard to the baseline (beyond natural variability) and restore populations, where deteriorated due to anthropogenic influences, to a healthy state”.*

For coastal bottlenose dolphins it could be further refined to: *“Maintenance of the current levels of the populations where stable, and where feasible and relevant, an increase in numbers”.* A recovery in areas where it was known to occur up to the 20th century might not be realistic in the short or medium term, given the life history parameters of bottlenose dolphins, with a slow reproduction. However, as several of the estuaries they occupied in the past are now much cleaner than they were, and fish are returning to them (e.g. Thames and Clyde estuaries), it is possible that they return to colonise these areas within a few decades.

For cetacean populations with a relatively small range, FCS could also be used.

¹ In the 2007 FCS assessments, this was undertaken on a country by country basis which led to an unsatisfactory standard of assessment at the European North Atlantic scale (ICES, 2009). For the 2013 FCS assessments, a greater emphasis has been placed on the need for a transboundary approach (European Commission, 2011), although this is unlikely to occur.

6. Spatial scope

The geographical scope of the indicator is species dependent. With the exception of some coastal bottlenose dolphins, cetacean populations cover large spatial scales often extending beyond European North-Atlantic waters for example. Assessments therefore need to be undertaken at an appropriate scale and a good understanding of natural variability and patterns of movement is required prior to any decline or increase in population size being detected and links made with anthropogenic activities. MUs for cetacean species, also to be used in indicator M-2 (distributional range and pattern) and M-6 (bycatch) assessments, have been defined by ASCOBANS (Evans & Teilmann, 2009), were further reviewed by ICES (2012), and were further adapted by ICES (2013) to, where possible, take account of well-known ICES block boundaries, specifically for bycatch assessment. MUs for all relevant species are proposed in annex 1.

Reference/baseline levels for each MU of:

- Harbour porpoise and white-beaked dolphin: can be derived from large scale surveys (SCANS);
- Common dolphin and bottlenose dolphin (wide ranging oceanic populations): can be derived from large scale surveys (SCANS, CODA);
- Bottlenose dolphin (coastal populations): can be derived from mostly long-term local/regional photo-ID studies;
- Minke whale: can be taken from the regular surveys undertaken by TNASS and Norwegian surveys, with additional information from large-scale surveys (SCANS, CODA); IWC undertakes regular assessments.

7. Monitoring requirements

The abundance of cetaceans can be monitored using a variety of techniques. Because of the scale required for assessments, a transboundary approach to the techniques used, and the collection, collation and analysis of data will be required. Also strandings data can be useful as complementary information to identify possible anthropogenic impacts², and can contribute to the identification of possible underlying reasons for trends.

The objective of the monitoring should be to detect trends, in particular negative ones, in the abundance of cetacean populations due to human pressures. As cetacean monitoring is costly, the frequency at which data should be collected shall depend on the species monitored; it can be yearly and with a high resolution for species with a limited range (e.g. for coastal bottlenose dolphin) up to decadal and with a coarse resolution for wide ranging species. Monitoring is undertaken through a variety of approaches and involves many different organisations. There have been large scale international surveys such as SCANS and CODA, annual national surveys in the waters of some Member States and, at a more localised scale, various

² Strandings data represent to date the most extensive and long-term source of demographic data for a number of cetacean populations (at least in areas where strandings occur). Although they cannot yield an absolute figure for abundance, they can in some cases be interpreted to provide for a relative indication of local and temporal variations in coastal abundance. Strandings data are currently clearly underexploited and rarely analysed at an international level. In addition, the investigation of stranded cetaceans can yield information on a number of life history parameters, and on causes of death, and therefore provide some indications about human pressures.

surveys undertaken by the state, by academic institutions and/or non-governmental organisations³. For the monitoring of this indicator, a coordinated combination of these types of survey will be required.

Since part of the monitoring is used to set baselines against which to set bycatch limits or trends, boundaries for MUs were defined (annex 1), where possible taking account of well-known ICES block boundaries.

Monitoring methods and frequency for:

- Harbour porpoise: aerial- and ship-based surveys; large-scale surveys every 6 years, complemented by more frequent surveys at a smaller spatial scale that yield information on a higher spatial and temporal resolution; such surveys also yield information for white-beaked dolphin;
- Common dolphin and bottlenose dolphin (wide ranging 'oceanic' populations): aerial- and ship-based surveys; large-scale surveys every 6 years;
- Bottlenose dolphin (coastal populations): photo-ID as the main method, but ship-based surveys can be appropriate; annually;
- Minke whale: regular surveys undertaken by TNASS and Norwegian surveys, with additional information from large-scale surveys (SCANS, CODA).

8. Appropriateness of the indicator

There is usually no straightforward link between the abundance of cetaceans and human activities. There are multiple pressures, and climate change is an additional factor influencing abundance and distribution. However, as top predators and animals general public concern, changes in distribution and abundance are important, and should be assessed against changes in human activities and climate change to detect cause-effect relationships, where necessary followed by the appropriate measures.

9. Reporting

Given that populations have a transboundary distribution (except for some coastal bottlenose dolphins), agreements have to be made on monitoring frequency. The reporting frequency should follow the monitoring frequency, and the assessment for most species should be made at least every 6 years. For the small cetaceans it is proposed that ICES makes the assessment, while for the minke whale a regular assessment of the north-east Atlantic population is made by the IWC.

³ A mechanism, the Joint Cetacean Protocol, is being developed that can bring these disparate datasets together at the NW European Atlantic scale (JCP, Paxton et al, 2011, see <http://jncc.defra.gov.uk/page-5657>). Effort-related cetacean sightings data from all major data sources are included e.g. SCANS I & II, CODA, European Seabirds at Sea (ESAS), SeaWatch Foundation (SWF) and other non-governmental organisations, as well as industry (e.g. in relation to potential renewable energy installations in UK waters). These data, collected between 1979 and 2010, represent the largest NW European cetacean sightings resource ever collated. It is recognised, however, that there are some significant datasets missing such as the annual national monitoring undertaken by some States. It is expected that the JCP will deliver information on the distribution, relative abundance and population trends of the more regularly occurring cetacean species occurring in NW European waters. A preliminary phase of the project, covering the Irish Sea and west coast of Scotland, was recently been completed (Paxton et al., 2011). This work was used to refine the modelling techniques that had been developed in earlier projects (Thomas, 2009; Paxton & Thomas, 2010; Paxton et al., 2011). A final analysis of north-west European waters will be published in 2013.

10. Costs

Cetacean monitoring can range from fairly cheap (monitoring of an inshore population with a limited range) to very expensive (monitoring of an offshore population distributed over a large area). Part of the monitoring is in place (in a combination of indicator M-2, M-4 and M-6), while new resources are needed, e.g. for annual surveillance and large scale decadal surveys (see also indicator M-2).

11. Further work

Work has begun on several subjects, but further work and/or agreement is needed:

- 1) A compilation of existing data on abundance..
- 2) An agreement on the delimitation of MUs; a proposal is made at annex 1..
- 3) The development of a baseline for each species in each MU.
- 4) The development of a standardized monitoring methodology, or alternatively a mechanism for standardizing data post collection. Although progress has been made, both effort-related monitoring of cetaceans and analytical procedures need further refinement and standardisation.
- 5) For small cetaceans, the development of an assessment tool and agreement on the body that makes the assessment.

Literature

European Commission, 2011. Assessment and reporting under Article 17 of the Habitats Directive Explanatory Notes & Guidelines for the period 2007-2012. Available at: http://circa.europa.eu/Public/irc/env/monnat/library?l=/habitats_reporting/reporting_2007-2012/reporting_guidelines&vm=detailed&sb=Title

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PART C: Technical specification of proposed common biodiversity indicators

Mammals

Code	Previous code*	Indicator	Category
M-1	31&33	Distributional range and pattern of grey and harbour seal breeding and haul-out sites, respectively	Core
M-2	32&34	Distributional range and pattern of cetaceans species regularly present	Core
M-3	35	Abundance of grey and harbour seal at breeding and haul-out sites, respectively	Core
M-4	36	Abundance at the relevant temporal scale of cetacean species regularly present	Core
M-5	37	Grey seal pup production	Core
M-6	38&39	Numbers of individuals within species being bycaught in relation to population	Core

Draft OSPAR Common Indicators: marine mammals (M-6)

Mortality of seals and cetaceans due to bycatch

1. Indicator

The indicator is “*mortality due to bycatch*”.

2. Reasoning for the development of this indicator

Marine mammals are usually slowly reproducing, and a high human-induced mortality, on top of natural mortality, can have serious and long-term implications for the population. An important source of human induced mortality that can be singled out is bycatch in fishing gear. While the number of animals bycaught is clearly pressure related, there is a link with a state of the population (population size - indicators M-3 and M-4).

For cetaceans, the Habitats Directive requires that incidental capture or killing is monitored, and that it should not have a significant negative impact on the species. Therefore the setting of limits for bycatch of cetaceans can be considered as a key aspect in achieving GES according to the MSFD. It has been agreed that bycatch targets can also be set for pinnipeds, as bycatch also occurs in these marine mammals. As the maximum population growth rates differ in marine mammals, different targets will be needed. Given the high mobility of marine mammals, and the distributional range of populations, assessments will necessarily need to be made on a wide scale (population range or management units). Difficulties exist in both measuring bycatch and population size in a sufficiently high degree of accuracy to draw conclusions, and in combining data originating from different regions for an overall assessment of GES.

Number of CPs reporting/using the indicator (n=9) : 7

Consensus among CPs on usefulness as part of a region wide set (n=8): 7

3. Parameter/metric

“Numbers of individuals being bycaught in relation to population size estimates”, determined separately for each Management Unit (MU). These MUs will vary between species..

4. Baseline and reference level

Although some historical bycatch estimates exist, the current levels of bycatch in relation to the population estimates (baseline), and a trend-based target can be used.

5. Target setting

The target *“The annual bycatch rate of [marine mammal species] is reduced to below levels that are expected to allow conservation objectives to be met”* may require different approaches for different species. Although bycatch occurs in a wide range of species, it should only be specifically assessed for those species for which there is sufficient data. Suggested species are harbour seal, grey seal, harbour porpoise, short beaked common dolphin and striped dolphin. However, noting the occurrence of bycatch in other species maybe useful information when assessing the factors possibly affecting the abundance and distribution (considered in M-2 and M-4).. Although some targets have been proposed and accepted, a review of these is currently being made. New targets will be proposed for each relevant species and for each relevant MU.

The harbour porpoise bycatch limit reference point of 1.7% is derived from work undertaken by a working group convened by the International Whaling Commission and ASCOBANS (IWC, 2000). This has subsequently become the standard target or level above which bycatch is considered to be unsustainable. However, there has been much debate about the use of a simple fraction of the best population estimate. A very simple deterministic population dynamics model was used, which assumed a “biological” population with independent population dynamics. If this management target is to be applied to management regions for harbour porpoise, the animals living in the areas defined by these regions are assumed to have more or less independent dynamics (which is clearly not the case in the European North Atlantic). Where the population dynamics are not independent, the management targets calculated on the basis of biological populations are unlikely to be appropriate. An alternative to such an approach is the bycatch management procedures developed under the SCANS-II and CODA projects (Winship, 2009).

In 2009, ICES advised the European Commission *‘that a Catch Limit Algorithm approach is the most appropriate method to set limits on the bycatch of harbour porpoises or common dolphins. In order to use this (or any other) approach, specific conservation objectives must first be specified. In both species improved information on bycatch and the biology of the species would improve the procedure.’* In 2010, ICES again advised the European Commission that *‘ICES advised in 2009 of the need for explicit conservation and management objectives for managing interactions between fisheries and marine mammal populations. This advice has not been acted upon. Lacking these objectives, ICES is unable to properly consider the impacts of these interactions in its management advice.’* WGMME (2013) noted again that this advice still had not been acted upon and, to aid such decisions, suggested that ASCOBANS be asked to consider the policy decisions required for the setting of safe bycatch limits.

An alternative for the parameter (bycatch as a proportion of the population size) is the use of the current bycatch numbers as the baseline and aim for it to be reduced in future years. This would mean that no information is required on the population size, but have the significant disadvantage that there is no link with the population state. Using such an approach, GES could only be considered to have been achieved when there was no longer any bycatch.

6. Spatial scope

Management Units (MUs) for the relevant cetaceans, also to be used in indicator M-2 and M-4 (distribution and abundance) assessments, are proposed in appendix. They are, where possible, delimited using the borders of ICES blocks as recommended by WGMME (2012) and WGBYC (2012). Seal MUs still need to be clearly defined.

7. Monitoring requirements

In 2008, the International Council for the Exploration of the Sea (ICES) Working Group on Marine Mammal Ecology tried to evaluate progress to date with the harbour porpoise bycatch EcoQO on a North Sea wide basis (WGMME, 2008). It was quickly apparent that many of the fisheries suspected to have the highest bycatch levels are conducted without bycatch observer programmes as these are not a requirement of Regulation 812/2004. Subsequently, ICES Working Group on Bycatch of Protected Species has tried to evaluate the impact of fisheries bycatch annually.

Extrapolated estimates of total bycatch in EU waters in 2009 (based on EC/812/2004 national reports) were available for striped dolphins (about 870), for common dolphins (around 1500), for bottlenose dolphins (10) and for harbour porpoises (about 1100) (WGBYC 2011). It is clear that these totals provide only a very patchy overview of total cetacean by-catches within European waters due to low and uneven sampling coverage (WGBYC, 2011). Reductions in bycatch should be considered as a target that will contribute to GES, but it is currently not possible to evaluate whether the indicator will provide an accurate assessment of GES. However, data collation techniques are continually improving and coverage of the relevant fisheries sectors has been increasing.

Problems in monitoring are the scale of assessment (marine mammal population distributions are wider than national waters), monitoring of bycatch is undertaken using different methodologies and to different standards, and, in some Member States, bycatch can occur in the recreational or part-time fishery sector, which is considerably harder to monitor.

As part of their national developments of MSFD indicators and targets, the UK is following ICES advice and has started work on the use of management frameworks for determining safe limits to bycatch for harbour porpoise, short-beaked common dolphin, bottlenose dolphin, harbour seal and grey seal. This work, however, is not being restricted to national waters.

A source of information, currently underexploited, are strandings. These not only provide demographic data for cetacean populations, but can also be used to detect changes in the causes of death within some degree of confidence, certainly with species for which sufficient numbers wash ashore (WGBYC, 2012; WGMME, 2012). Although absolute estimates should be treated with caution, trends are likely to be informative, and a good coverage and a standardised methodology is needed.

8. Appropriateness of the indicator

Bycatch is considered as one of the major anthropogenic threats to marine mammals. It is easy to understand and quantify (although the methods for quantification are not straightforward), and there is a clear link with human activities (different fishing métiers). The target set should indicate the level at which, in the absence of other important human-induced threats, conservation objectives will be met.

9. Reporting

The proposed target means that knowledge is required both on bycatch and on the population size, both spatially and temporally, and within appropriate confidence values. This poses problems, as has been demonstrated by WGBYC (2010). With the available data on bycatch of harbour porpoises it was not possible to conclude whether or not the set target had been met during the most recent years. Estimates of bycatch were made on the basis of the number of fishing days per fisherman, the landings in relevant fisheries, and on board observer schemes. Currently, observer schemes are not required in all relevant fisheries according to the fisheries legislation. There is an obligation under the Habitats Directive to monitor bycatch, but it has to date not been enforced by the European Commission, and obligations also exist under the Common Fisheries Policy.

It is proposed that reporting follows the monitoring, and that the assessment of the bycatch of seals and small cetaceans is undertaken by ICES at least every 6 years. WGBYC have developed a database of bycatch based on national reports which contains the relevant information from which to make such assessments.

10. Costs

Both monitoring marine mammal abundance (indicators M-3 and M-4) and bycatch rates can be expensive, especially where a high coverage of fisheries through independent observers on board is required. Cheaper methods exist, such as the use of camera systems on board, or a voluntary reporting scheme by fishermen.

11. Further work

There is clearly a lack of information on aspects of this indicator, although information is slowly improving. Concerning the population sizes of the marine mammals, and the assessment scale, the lack of information and proposed future steps are described in the summaries of the indicators M-3 and M-4 (Abundance). Concerning bycatch, the following aspects should be further developed through linkages with appropriate fora:

- 1) Agreement on the MUs against which to set the targets; a proposal for cetaceans is included in appendix 1.
- 2) Development of safe bycatch limits for each species and MU..
- 3) A standardized reporting method and frequency needs to be developed together with an assessment tool. Agreement is needed on which body will make the assessment, although it is suggested that this should be progressed through ICES.
- 4) Investigation of the use of stranded animals to derive information on trends in causes of mortality.

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Appendix 1: Management Units

WGMME (2013) recommended that Member States use the following management units for reporting requirements of the Habitats Directive and for the development of indicators and their assessment for the Marine Strategy Framework Directive.

There is a single MU in the European North Atlantic for common dolphin (*Delphinus delphis*), white-beaked dolphin (*Lagenorhynchus albirostris*), white-sided dolphin (*Lagenorhynchus acutus*), striped dolphin (*Stenella coeruleoalba*) and minke whale (*Balaenoptera acutorostrata*).

For harbour porpoise (*Phocoena phocoena*), MUs are proposed for the Iberian Peninsula, Celtic Sea, Irish Sea, West Scotland/NW Ireland, the North Sea and Inner Danish Waters (Figure 1). More than one MU in the North Sea for harbour porpoise should be explored in ongoing work to develop management models for setting safe limits to bycatch.

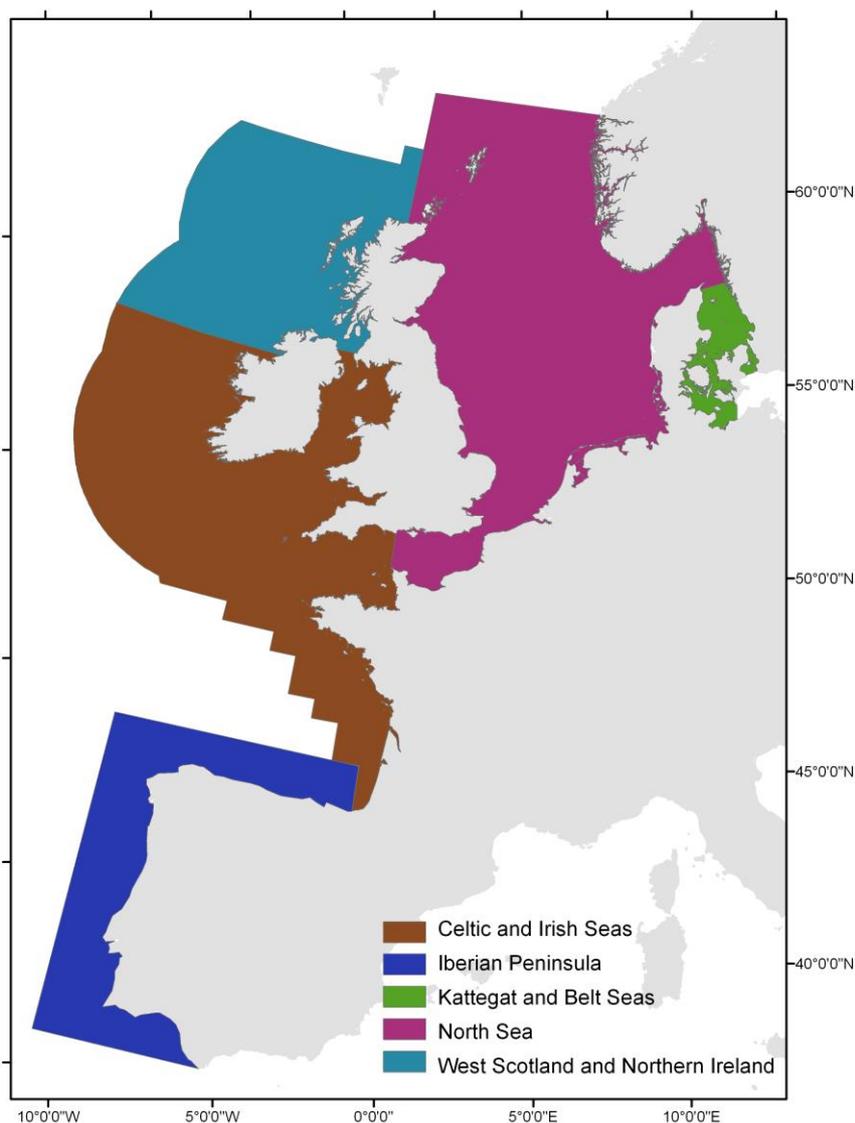


Figure 1: Harbor porpoise management units

Bottlenose dolphins have a complex population structure, with three types being recognized: very small residential groups, slightly wider ranging resident coastal groups and the oceanic group. The following Management Units are proposed (given from north to south; Figure 2):

Resident groups: Barra (Scotland); Shannon Estuary (Ireland); Ile de Sein and Archipel de Molene (France); Galician rias (Spain); Sado Estuary (Portugal).

Coastal groups: east coast of Scotland (UK); Inner Hebrides (UK); Irish Sea (Ireland and UK); Connemara-Mayo (northern and western coasts of Ireland); southern coast of Ireland; the coastal English Channel/Celtic Sea (UK); northern coast of France, northern coast of Spain; Galicia (Spain); coast of Portugal; the Azores (Portugal), Gulf of Cadiz (southern coast of Spain) and Strait of Gibraltar (southern coast of Spain).

Oceanic waters: a single MU for all continental shelf/slopes/oceanic waters outside 12nm from the coast. It should be noted that although this MU extends into the North Sea (represented by ICES Area IV, excluding coastal east Scotland) and that very few bottlenose dolphin are seen in this area and, although there is no conclusive evidence, those seen are thought to belong to the Coastal Scottish group.

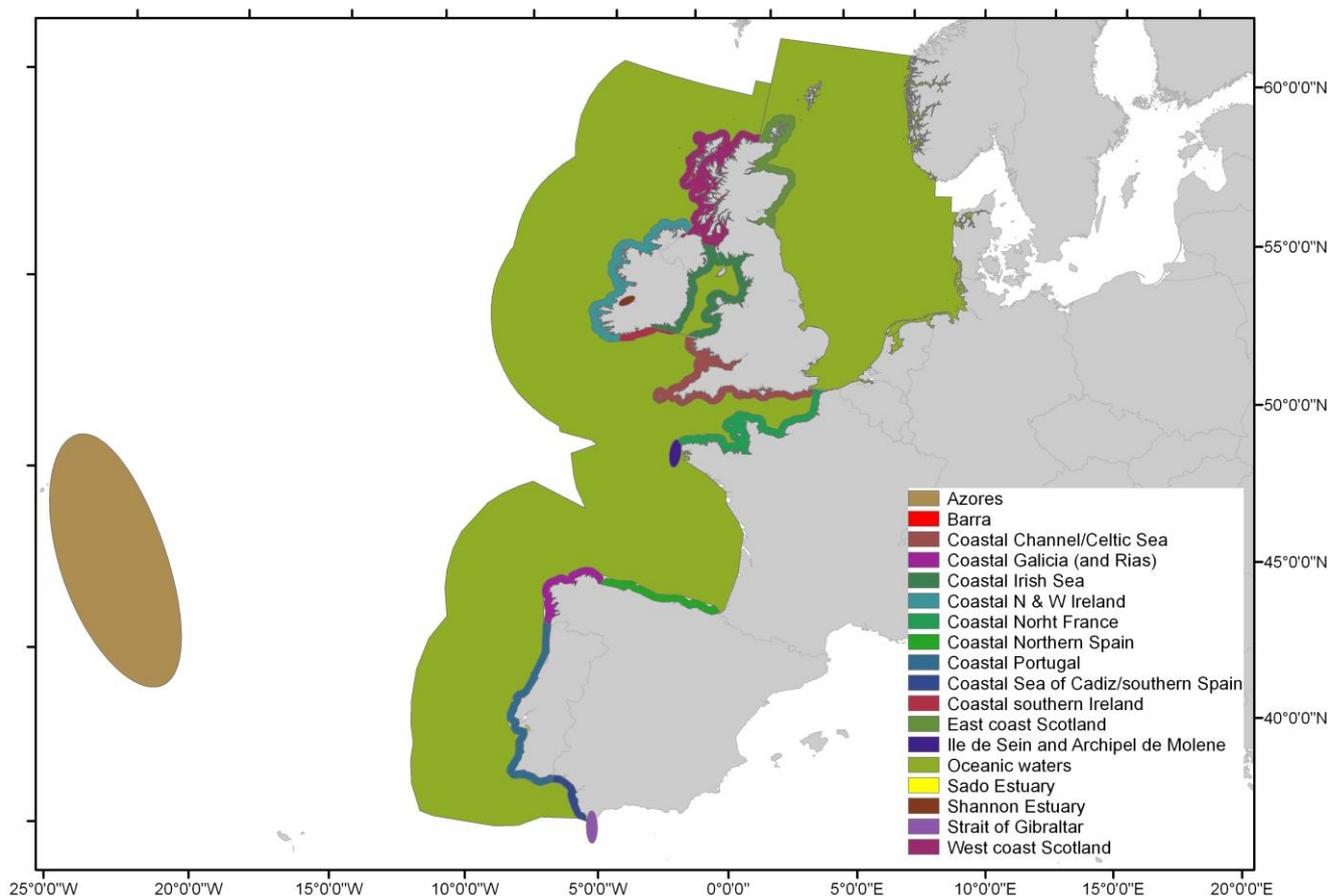


Figure 2: Bottlenose dolphin management units.