

### 1.6.6.3 OSPAR request on indicator assessment of cetacean species other than coastal bottlenose dolphins

#### Advice summary

An overview of data on distribution and abundance of cetacean species other than coastal bottlenose dolphins (*Tursiops truncatus*) is presented. ICES advises that for none of these species is there currently sufficient information to make regional assessments in the frame of indicator M-4. However, new information scheduled to become available in early 2017 from a 2016 survey may allow an assessment to be made for harbour porpoise (*Phocoena phocoena*<sup>\*</sup>, particularly in OSPAR Region II) against the proposed targets.

#### Request

ICES is requested to support OSPAR in the delivery of common indicator assessment of Cetaceans through:

- iii. To present an overview of data on cetacean species other than coastal bottlenose dolphins that may be available to make a regional assessment in the frame of indicator M-4;
- iv. To collate and assess the data identified against the targets proposed.

#### Elaboration on the advice

Cetaceans are widely distributed across European Atlantic waters in a variety of coastal, shelf, and offshelf habitats. Of the more frequently encountered species, the harbour porpoise and white-beaked dolphin (*Lagenorhynchus albirostris*) are mostly restricted to shelf waters in this region. Striped dolphin (*Stenella coeruleoalba*), fin whale (*Balaenoptera physalus*), sperm whale (*Physeter macrocephalus*), northern bottlenose whale (*Hyperoodon ampullatus*) and pilot whales (*Globicephala* spp.) are primarily found in offshelf waters. Bottlenose and short-beaked common dolphins (*Delphinus delphis*), and minke whales (*Balaenoptera acutorostrata*) are found in both shelf and offshelf waters.

Robust abundance estimates are available from purpose-designed large-scale surveys for ten cetacean species in European Atlantic waters: harbour porpoise; white-beaked, bottlenose, common, and striped dolphins; and minke, fin, sperm, pilot, and beaked whales (Family: *Ziphiidae*, all species combined). The most comprehensive estimates are from the combination of the SCANS-II and CODA surveys in 2005 and 2007, respectively, which cover almost all of OSPAR Regions II, III, and IV. Together, these estimates show that well over one million individual cetaceans live in these three regions (CODA, 2009; Gilles *et al.*, in review; Hammond *et al.*, 2013; Laran *et al.*, in review; Macleod *et al.*, 2011; Rogan *et al.*, in review; Solvang *et al.*, 2015). The most abundant species are the harbour porpoise with an estimated 375 000 animals, and common and striped dolphins with most estimates for both species combined ranging from 220 000 to 700 000. Pilot whales are also abundant; approximately 150 000 animals have been estimated. Around 30 000 individuals each of minke, fin, and beaked whales have been estimated, together with 36 000 bottlenose dolphins, 17 000 white-beaked dolphins, and 7000 sperm whales. Details of all robust estimates of abundance are given in Annex 1.

There is insufficient information to assess changes in distribution over time; however, for harbour porpoise in the North Sea, distribution shifted markedly from primarily in the north to primarily in the south between 1994 and 2005, most likely because of shifts in relative prey availability (Hammond *et al.*, 2013).

Only for harbour porpoise, white-beaked dolphin, and minke whale in OSPAR Region II are there two or more comparable estimates of abundance (Hammond *et al.*, 2002, 2013; Solvang *et al.*, 2015), but the time-series are currently too short to make assessments against the proposed targets (ICES, 2014). Notwithstanding this, a qualitative comparison indicates that recent estimates of abundance are either similar to or larger than earlier comparable estimates.

---

<sup>\*</sup> Version 2: Latin name corrected

## Basis of the advice

### Background

A total of 35 different species of cetacean have been recorded within OSPAR Regions II, III, and IV. Many are widely-dispersed oceanic species that are rarely seen in European Atlantic waters and thus difficult to monitor systematically. Assessment in the frame of indicator M-4 should thus be restricted to assessing those species for which robust information on abundance and distribution is available.

Information on distribution and abundance has been collated from published and unpublished sources describing the results from large-scale aerial and ship-board line transect surveys for cetaceans (see Sources and references). This information comes primarily from a small number of large-scale systematic surveys.

Robust information on abundance and distribution in OSPAR Regions II, III, and IV is available on the following species: harbour porpoise, common bottlenose dolphin (offshore), white-beaked dolphin, short-beaked common dolphin, striped dolphin, minke whale, fin whale, long-finned pilot whale, sperm whale, and beaked/bottlenose whales as a combined species group. Details are provided in Annex 1.

ICES has advised on assessment units to use when assessing good environmental status (GES) for a number of cetacean species (ICES, 2014). For harbour porpoise, six assessment units were defined. A single assessment unit covering all European Atlantic waters was defined for minke whale, white-beaked dolphin, and short-beaked common dolphin. For bottlenose dolphin, ten assessment units were defined for resident or semi-resident coastal/inshore bottlenose dolphins (see Advice Section 1.6.6.2) plus a single offshore "oceanic area" assessment unit for bottlenose dolphins to cover all waters not covered by the coastal/inshore assessment units (ICES, 2014). Reference to bottlenose dolphins in the text above and Annex 1 relates primarily to this offshore "oceanic area".

Regarding indicator targets, ICES (2014) advice to OSPAR suggested:

- a) A suitable indicator target for harbour porpoises could be '*For each assessment unit, maintain harbour porpoise population size at or above baseline levels, with no decrease of  $\geq 30\%$  over a three generation period (36 or 22.5 years).*' The 22.5 years is based on data primarily from OSPAR Regions II and III and is therefore preferable.
- b) A suitable indicator target for white-beaked dolphins could be '*Maintain the white-beaked dolphin population size at or above the baseline levels, with no decrease of  $\geq 30\%$  over a three-generation period (54 years).*'
- c) A suitable indicator target for minke whales could be '*Maintain the minke whale population size at or above the baseline levels, with no decrease of  $\geq 30\%$  over a three-generation period (66 years).*'

The information collected on all species was insufficient to make an assessment against indicator targets.

A third purpose-designed large-scale survey for cetaceans in European Atlantic waters will take place in July 2016 (SCANS-III). Estimates of abundance from this survey are scheduled to be available in early 2017. This will provide a third abundance estimate for harbour porpoise in OSPAR Region II over a period of 22 years. ICES (2014) advice to OSPAR suggested a suitable indicator target for harbour porpoises could be '*For each assessment unit, maintain harbour porpoise population size at or above baseline levels, with no decrease of  $\geq 30\%$  over a three generation period (36 or 22.5 years).*' The 22.5 years is based on data primarily from OSPAR Regions II and III and is therefore preferable. Thus, assessment against the indicator target proposed may be possible once the new estimate of abundance from SCANS-III is available.

## Sources and references

CODA. 2009. Cetacean Offshore Distribution and Abundance in the European Atlantic (CODA). Final Report 11-Feb-2009. 43 pp. <http://biology.st-andrews.ac.uk/coda/>.

- Gilles, A., Viquerat, S., Becker, E. A., Forney, K. A., Geelhoed, S. C. V., Haelters, J., Nabe-Nielsen, J., *et al.* In review. Seasonal habitat-based density models for a marine top predator, the harbor porpoise, in a dynamic environment. *Ecosphere*.
- Hammond, P. S., Berggren, P., Benke, H., Borchers, D. L., Collet, A., Heide-Jørgensen, M. P., Heimlich, S., *et al.* 2002. Abundance of harbour porpoise and other cetaceans in the North Sea and adjacent waters. *Journal of Applied Ecology*, 39: 361–376.
- Hammond, P. S., Macleod, K., Berggren, P., Borchers, D. L., Burt, M. L., Cañadas, A., Desportes, G., *et al.* 2013. Cetacean abundance and distribution in European Atlantic shelf waters to inform conservation and management. *Biological Conservation*, 164: 107–122.
- ICES. 2014. OSPAR request on implementation of MSFD for marine mammals. *In* Report of the ICES Advisory Committee, 2014. ICES Advice 2014, Book 1, Section 1.6.6.1.
- Laran, S., Authier, M., Blanck, A., Doremus, G., Falchetto, H., Monestiez, P., Pettex, E., *et al.* In review. Seasonal distribution and abundance of cetaceans within French waters: Part II: The Bay of Biscay and the English Channel. *Deep Sea Research II*.
- Macleod, K., Hammond, P. S., Burt, L., Cañadas, A., Lens, S., Mikkelsen, B., Rogan, E., *et al.* 2011. Abundance of baleen whales in the European Atlantic. Paper SC/63/RMP24 presented to the Scientific Committee of the International Whaling Commission. Unpublished.
- Rogan, E., Cañadas, A., Macleod, K., Santos, B., Mikkelsen, B., Uriarte, A., Van Canneyt, O., *et al.* In review. Distribution, abundance and habitat use of deep diving cetaceans in the North East Atlantic. *Deep Sea Research II*.
- Solvang, H. K., Skaug, H. J. and Øien, N. I. 2015. Abundance estimates of common minke whales in the Northeast Atlantic based on survey data collected over the period 2008–2013. Paper SC/66a/RMP8 presented to the Scientific Committee of the International Whaling Commission. Unpublished.
- Viquerat, S., Herr, H., Gilles, A., Peschko, V., Siebert, U., Sveegaard, S., and Teilmann, J. 2014. Abundance of harbour porpoises (*Phocoena phocoena*) in the western Baltic, Belt Seas and Kattegat. *Marine Biology*, 161: 745–754.

## Annex 1

Table 1.6.6.3.1 Abundance estimates of cetacean species other than coastal bottlenose dolphins.

Species / Population	Survey / area	Estimate type	Estimate (CV)	Year	Assessment Unit (AU)	Notes	Reference
Beaked whales (all)	CODA, SCANS-II & T-NASS (F)	Model-based	29,205 (0.23)	2005/2007	No specified MU	OSPAR Regions II, III, IV & V	Rogan <i>et al.</i> (in review)
Bottlenose dolphin	SAMM / English Channel, Biscay	Design-based	Winter 19,106 (0.23); Summer 13,255 (0.35)	2011-12	English Channel / Oceanic waters	English Channel + part Bay of Biscay	Laran <i>et al.</i> (in review)
Bottlenose dolphin	SCANS-II	Design-based	16,485 (0.42)	2005	Multiple	OSPAR Regions II, III, IV & V	Hammond <i>et al.</i> (2013)
Bottlenose dolphin	CODA	Design-based	19,295 (0.25)	2007	Oceanic waters	OSPAR Regions III, IV & V	CODA (2009)
Bottlenose dolphin	SCANS-II + CODA	Design-based	35,780 (0.24)	2005/2007	Oceanic waters	Part of MU, OSPAR Regions II, III, IV & V	CODA (2009)
Common + striped dolphins	CODA	Design-based	224,166 (0.48)	2007	Single MU	Part of MU, OSPAR Regions III, IV & V	CODA (2009)
Common + striped dolphins	SAMM / English Channel, Biscay	Design-based	Winter 299,896 (0.11); Summer 696,013 (0.10)	2011-12	Single MU	English Channel + part Bay of Biscay	Laran <i>et al.</i> (in review)
Common dolphin	SCANS-II	Design-based	56,221 (0.23)	2005	Single MU	Part of MU, OSPAR Regions II, III, IV & V	Hammond <i>et al.</i> (2013)
Common dolphin	CODA	Design-based	118,264 (0.38)	2007	Single MU	Part of MU, OSPAR Regions III, IV & V	CODA (2009)
Common dolphin	SCANS-II + CODA	Design-based	174,485 (0.27)	2005/2007	Single MU	Part of MU, OSPAR Regions II, III, IV & V	Hammond <i>et al.</i> (2013); CODA (2009)
Fin whale	CODA, SCANS-II	Design-based	29,512 (0.26) including % of unidentified large whales	2005/2007	No specified MU	OSPAR Regions II, III, IV & V	Macleod <i>et al.</i> (2011)
Fin whale	CODA, SCANS-II	Model-based	19,751 (0.17)	2005/2007	No specified MU	OSPAR Regions II, III, IV & V	Macleod <i>et al.</i> (2011)
Harbour porpoise	SCANS / Block A	Design-based	36,286 (0.57)	1994	Celtic and Irish Seas	Part of MU	Hammond <i>et al.</i> (2002)
Harbour porpoise	SCANS-II / Block B	Design-based	40,927 (0.38)	2005	Celtic and Irish Seas	Block B spans two MUs (also North Sea)	Hammond <i>et al.</i> (2013)
Harbour porpoise	SCANS-II / Block Q	Design-based	11,011 (1.14)	2005	Celtic and Irish Seas	Block Q spans two MUs (also W Scotland / N Ireland)	Hammond <i>et al.</i> (2013)
Harbour porpoise	SCANS-II / Block O	Design-based	15,230 (0.35)	2005	Celtic and Irish Seas	Part of MU	Hammond <i>et al.</i> (2013)
Harbour porpoise	SCANS-II / Block P	Design-based	72,389 (0.53)	2005	Celtic and Irish Seas	Part of MU	Hammond <i>et al.</i> (2013)
Harbour porpoise	SCANS-II / Block R	Design-based	10,716 (0.37)	2005	Celtic and Irish Seas	Part of MU	Hammond <i>et al.</i> (2013)

Species / Population	Survey / area	Estimate type	Estimate (CV)	Year	Assessment Unit (AU)	Notes	Reference
Harbour porpoise	SCANS-II / Block W	Design-based	2,357 (0.92)	2005	Celtic and Irish Seas	Part of MU	Hammond <i>et al.</i> (2013)
Harbour porpoise	SCANS-II / Block W	Design-based	2,357 (0.92)	2005	Iberian Peninsula	Block W spans two MUs	Hammond <i>et al.</i> (2013)
Harbour porpoise	SCANS-II / Block Z	Design-based	0 (no sightings)	2005	Iberian Peninsula	Part of MU	Hammond <i>et al.</i> (2013)
Harbour porpoise	Depons	Model-based	Spring 372,167 (0.18); Summer 361,146 (0.20); Autumn 228,913 (0.19)	2005-2013	North Sea	Area of prediction slightly smaller than MU	Gilles <i>et al.</i> (in review)
Harbour porpoise	SAMM / English Channel, Biscay	Design-based	Winter 31,199 (0.21); Summer 46,345 (0.12)	2011-12	North Sea / Biscay & Iberia	Small part North Sea; part Bay of Biscay	Laran <i>et al.</i> (in review)
Harbour porpoise	SCANS-II / Block Q	Design-based	11,011 (1.14)	2005	W Scotland / N Ireland	Block Q spans two MUs (also Celtic and Irish Seas)	Hammond <i>et al.</i> (2013)
Harbour porpoise	SCANS-II / Block N	Design-based	12,076 (0.43)	2005	W Scotland / N Ireland	Part of MU	Hammond <i>et al.</i> (2013)
Harbour porpoise	SCANS / Block I	Design-based	36,046 (0.34)	1994	Kattegat / Belt Seas	Survey block extends north beyond MU	Hammond <i>et al.</i> (2002)
Harbour porpoise	SCANS / Block X	Design-based	392 (0.46)	1994	Kattegat / Belt Seas	Very small part of MU	Hammond <i>et al.</i> (2002)
Harbour porpoise	SCANS-II / Block S	Design-based	19,129 (0.36)	2005	Kattegat / Belt Seas	Survey block extends beyond MU	Hammond <i>et al.</i> (2013)
Harbour porpoise	Kattegat / Belt Seas	Design-based	40,475 (0.24)	2012	Kattegat / Belt Seas	All of MU	Viquerat <i>et al.</i> (2014)
Harbour porpoise	SCANS-II / Block H	Design-based	3,891 (0.45)	2005	North Sea	Part of MU	Hammond <i>et al.</i> (2013)
Harbour porpoise	SCANS-II / Block J	Design-based	10,254 (0.36)	2005	North Sea	Part of MU	Hammond <i>et al.</i> (2013)
Harbour porpoise	SCANS-II / Block L	Design-based	11,575 (0.43)	2005	North Sea	Part of MU	Hammond <i>et al.</i> (2013)
Harbour porpoise	SCANS-II / Block B	Design-based	40,927 (0.38)	2005	North Sea	Block B spans two MUs (also Celtic and Irish Seas)	Hammond <i>et al.</i> (2013)
Harbour porpoise	SCANS-II / Block M	Design-based	3,948 (0.38)	2005	North Sea	Part of MU	Hammond <i>et al.</i> (2013)
Harbour porpoise	SCANS-II / Block T	Design-based	19,369 (0.34)	2005	North Sea	Part of MU	Hammond <i>et al.</i> (2013)
Harbour porpoise	SCANS-II / Block U	Design-based	93,938 (0.28)	2005	North Sea	Part of MU	Hammond <i>et al.</i> (2013)
Harbour porpoise	SCANS-II / Block V	Design-based	47,048 (0.36)	2005	North Sea	Part of MU	Hammond <i>et al.</i> (2013)
Harbour porpoise	SCANS-II / Block Y	Design-based	1,473 (0.47)	2005	North Sea	Part of MU	Hammond <i>et al.</i> (2013)
Harbour porpoise	SCANS / Block B	Design-based	0 (no sightings)	1994	North Sea	Part of MU	Hammond <i>et al.</i> (2002)
Harbour porpoise	SCANS / Block C	Design-based	16,939 (0.18)	1994	North Sea	Part of MU	Hammond <i>et al.</i> (2002)
Harbour porpoise	SCANS / Block D	Design-based	37,144 (0.25)	1994	North Sea	Part of MU	Hammond <i>et al.</i> (2002)

Species / Population	Survey / area	Estimate type	Estimate (CV)	Year	Assessment Unit (AU)	Notes	Reference
Harbour porpoise	SCANS / Block E	Design-based	31,419 (0.49)	1994	North Sea	Part of MU	Hammond <i>et al.</i> (2002)
Harbour porpoise	SCANS / Block F	Design-based	92,340 (0.25)	1994	North Sea	Part of MU	Hammond <i>et al.</i> (2002)
Harbour porpoise	SCANS / Block G	Design-based	38,616 (0.34)	1994	North Sea	Part of MU	Hammond <i>et al.</i> (2002)
Harbour porpoise	SCANS / Block H	Design-based	4,211 (0.29)	1994	North Sea	Part of MU	Hammond <i>et al.</i> (2002)
Harbour porpoise	SCANS / Block J	Design-based	24,335 (0.34)	1994	North Sea	Part of MU	Hammond <i>et al.</i> (2002)
Harbour porpoise	SCANS / Block L	Design-based	11,870 (0.47)	1994	North Sea	Part of MU	Hammond <i>et al.</i> (2002)
Harbour porpoise	SCANS / Block M	Design-based	5,666 (0.27)	1994	North Sea	Part of MU	Hammond <i>et al.</i> (2002)
Harbour porpoise	SCANS / Block Y	Design-based	4,077 (0.26)	1994	North Sea	Part of MU	Hammond <i>et al.</i> (2002)
Minke whale	SCANS	Design-based	8,445 (0.24)	1994	Single MU	Part of MU, OSPAR Regions II & III	Hammond <i>et al.</i> (2002)
Minke whale	Norwegian / North Sea	Design-based	14,046 (0.28)	1995	Single MU	Part of OSPAR Regions I, II & III	Solvang <i>et al.</i> (2015)
Minke whale	Norwegian / North Sea	Design-based	27,364 (0.21)	1996-2001	Single MU	Part of OSPAR Regions I, II & III	Solvang <i>et al.</i> (2015)
Minke whale	Norwegian / North Sea	Design-based	6,246 (0.48)	2002-2007	Single MU	Part of MU, mostly OSPAR Region II	Solvang <i>et al.</i> (2015)
Minke whale	SCANS-II	Design-based	18,958 (0.35)	2005	Single MU	Part of MU, OSPAR Regions II, III, IV & V	Hammond <i>et al.</i> (2013)
Minke whale	SCANS-II & CODA	Design-based	30,410 (0.34)	2005/2007	Single MU	OSPAR Regions II, III, IV & V	Macleod <i>et al.</i> (2011)
Minke whale	Norwegian / North Sea	Design-based	6,891 (0.31)	2008-2013	Single MU	Part of MU, mostly OSPAR Regions II	Solvang <i>et al.</i> (2015)
Minke whale	Norwegian / NE Atlantic	Design-based	89,623 (0.18)	2008-2013	Single MU	Larger than MU, OSPAR Regions I, II & III	Solvang <i>et al.</i> (2015)
Minke whale	SAMM / English Channel, Biscay	Design-based	Winter 363 (1.02); Summer 5,223 (0.33)	2011-12	Single MU	English Channel + part Bay of Biscay	Laran <i>et al.</i> (in review)
Pilot whale	CODA, SCANS-II & T-NASS (F)	Model-based	152,071 (0.25)	2005/2007	No specified MU	OSPAR Regions II, III, IV & V	Rogan <i>et al.</i> (in review)
Sperm whale	CODA, SCANS-II & T-NASS (F)	Design-based	3,267 (0.23) / 7,035 (0.28) including % of unid large whales	2005/2007	No specified MU	OSPAR Regions II, III, IV & V	Rogan <i>et al.</i> (in review)
Striped dolphin	CODA	Design-based	61,364 (0.93)	2007	Single MU	Part of MU, OSPAR Regions III & IV	CODA (2009)

Species / Population	Survey / area	Estimate type	Estimate (CV)	Year	Assessment Unit (AU)	Notes	Reference
White-beaked dolphin	SCANS	Design-based	7,856 ( 0.30)	1994	Single MU	Excluding western part of MU	Hammond <i>et al.</i> (2002)
White-beaked dolphin	SCANS-II	Design-based	16,536 (0.30)	2005	Single MU	OSPAR Regions II, III & IV	Hammond <i>et al.</i> (2013)