Agenda Item 4.1.3

Priorities in the Implementation of the Triennium Work Plan (2010-2012)
ASCOBANS Baltic Recovery Plan (Jastarnia Plan)
Coverage of the Western Baltic, Inner Danish Waters and Kattegat/Skagerrak Area

Document 4-03

Draft Conservation Plan for the Harbour Porpoise Population in the Western Baltic, the Belt Sea and the Kattegat

Action Requested

- Take note of the draft document
- Comment
- Endorse the Conservation Plan

Submitted by

Jastarnia Group

NOTE:
IN THE INTERESTS OF ECONOMY, DELEGATES ARE KINDLY REMINDED TO BRING THEIR OWN COPIES OF DOCUMENTS TO THE MEETING

Secretariat's Note

The 7th Meeting of the Jastarnia Group (February 2011) had forwarded the following recommendation to the Advisory Committee:

"A consultant should be commissioned to develop, with intersessional input from the Jastarnia Group, a draft paper containing background information and proposed objectives and measures for the "gap area" currently not covered by the Jastarnia Plan. This paper should be reviewed and refined by the 8th Meeting of the Jastarnia Group with a view to enabling formal adoption of such objectives and measures by the 7th Meeting of the Parties."

This recommendation was endorsed by the 18th Meeting of the Advisory Committee (Bonn, Germany, May 2011), which also agreed to make funding available for the consultancy.

This draft Conservation Plan has accordingly been prepared by a team of the University of Aarhus under contract from ASCOBANS. It was circulated to members of the Jastarnia Group on 3 January 2012 and subsequently discussed at the Group's 8th Meeting (31 January - 2 February 2012). The Jastarnia Group made substantive inputs during the meeting, and it was agreed that a revised version would be circulated again shortly afterwards, for additional written comments. This revised draft was circulated on 8 February, with 14 February given as deadline for comments.

The draft contained in this document incorporates all comments received by 14 February. However, it should be noted that some in the Group felt that more time was needed to work through the draft Conservation Plan thoroughly. It should therefore be understood that this version does not yet reflect a consensus of the Jastarnia Group, but rather reflects the point to which discussions progressed to date.

The Jastarnia Group strongly recommends that Parties undertake national consultations with stakeholders, in particular the fishing sector, to give them the opportunity to provide comments before the draft Conservation Plan is finalized. If possible, Parties should start these consultations prior to the 19th Meeting of the Advisory Committee to inform that meeting's deliberation of the Plan.

The Advisory Committee is requested to review and as appropriate amend the draft Conservation Plan for Harbour Porpoises in the Western Baltic, Belt Seas and Kattegat, with a view to the Plan being adopted at the 7th Meeting of the Parties.

ASCOBANS

Draft Conservation Plan for

The Harbour Porpoise Population

in the Western Baltic, the Belt Sea and the Kattegat

Draft version February 2012

Contents

1. Executive Summary – will be written when plan is approved

1.1 Background

1.2 Management Recommendations

2. Introduction

Neither the original Recovery Plan for Baltic Harbour Porpoises (Jastarnia Plan) of 2002 nor the revised and updated version adopted in 2009 contains any definition as to their exact geographical scope. It is, however, generally assumed that the Plan follows the definition used by the ASCOBANS Baltic Discussion Group, according to which the Baltic Sea comprises "the waters in ICES Division IIId (area 24-29) east of the Darss-Limhamn ridges and south of the Åland Islands" ("Baltic Proper", cf. **Fig. 1**). However, the ASCOBANS Conservation Plan for Harbour Porpoises in the North Sea, adopted in 2009, contains an (implicit) definition of its geographical scope as the waters "northwards of latitude 57°44.8'N from the northernmost point of Denmark to the coast of Sweden" (**Fig. 1**). Therefore, part of the western Baltic, the Danish Straits and the Kattegat is not covered by either Plan, and as a consequence the geographical extent of the Jastarnia Plan has long been controversial. It has repeatedly been on the agenda of the various ASCOBANS Agreement bodies for several years but the issue has remained unresolved.

In 2011, the 18th meeting of the ASCOBANS Advisory Committee (AC 18, Bonn, Germany), following a recommendation by the 7th meeting of the Jastarnia Group (Copenhagen, Denmark, February 2011) decided a draft paper containing background information and proposed objectives and measures for the 'gap area' currently not covered by the Jastarnia Plan should be commissioned. Moreover, AC 18 stipulated that this paper should be reviewed and refined by the 8th meeting of the Jastarnia Group with a view to enabling formal adoption of such objectives and measures by the 7th Meeting of the Parties.

This draft plan covers the 'gap area' defined as the waters north and west of the Darss and Limhamn ridges and south of the border of the ASCOBANS North Sea Plan for harbour porpoises up to the north-western border of the Baltic Sea as defined by HELCOM (i.e. a line from the northern point of Denmark to the coast of Sweden at 57°44.43'N). This area will hereinafter be referred to as the Western Baltic, the Belt Sea and the Kattegat.

The draft paper was reviewed and revised by the 8th Meeting of the Jastarnia Group (Bonn, 31 January – 2 February 2012).

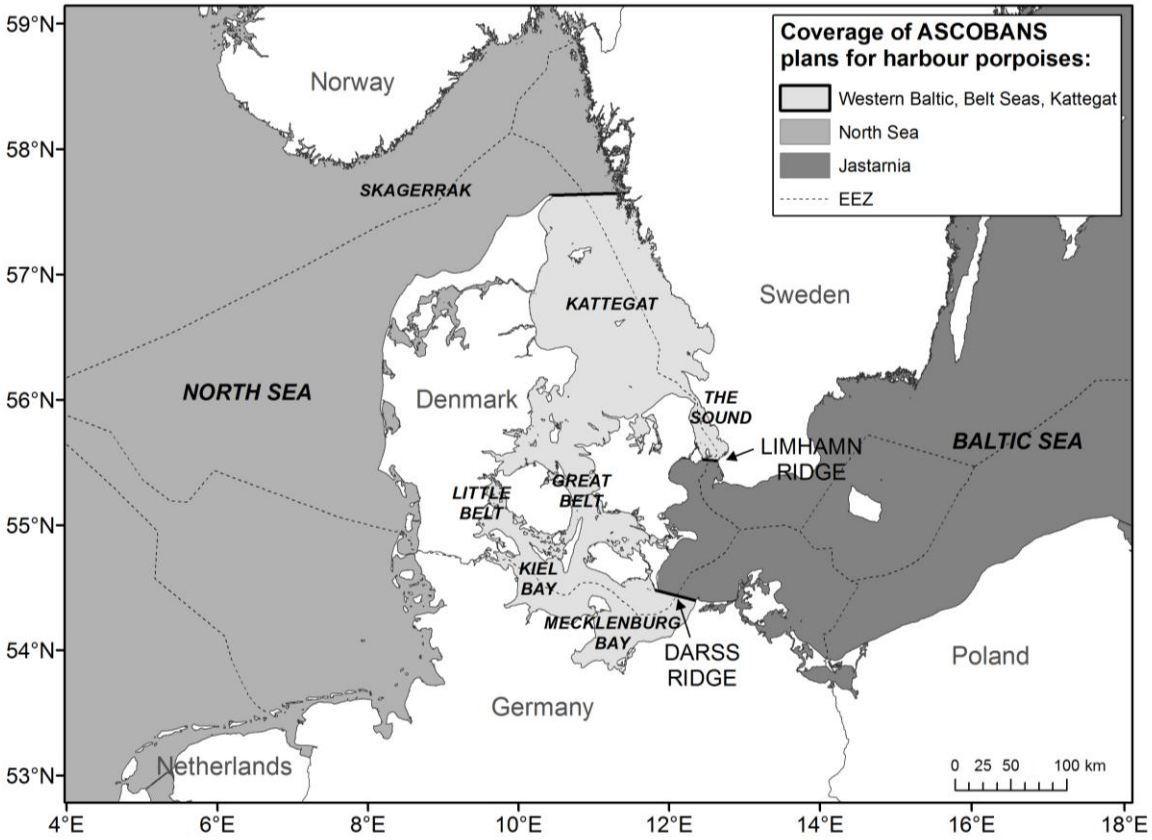

Figure 1 *Map of the North Sea and the Baltic indicating the geographical extent of the ASCOBANS North Sea Plan for harbour porpoises, the Jastarnia Plan and the current Plan for the population in the western Baltic, the Belt Sea and the Kattegat (the "gap area"). The dashed line indicates the Exclusive Economic Zone (EEZ = national borders).*

3. Background Information on harbour porpoises

The harbour porpoise is the most common cetacean in the western Baltic, the Belt Sea and the Kattegat and the only cetacean known to reproduce here. In the past two decades, our knowledge of harbour porpoise genetics, distribution, abundance, prey preferences, ecology and anthropogenic threats has greatly improved in this region due to the development of novel methods and intensified efforts from researchers, partly facilitated by increased management focus from national authorities, international organisations and the EU. Consequently - as opposed to the harbour porpoise population in the Baltic Proper – the population residing in the western Baltic, the Belt Sea and the Kattegat is one of the best studied harbour porpoise populations in the world. Yet, essential information such as sustainability of the population, drivers for distribution, effects of anthropogenic utilisation of the sea, e.g. bycatch, underwater noise, pollution and other threats remains unclear. In this section, the current knowledge is described and essential gaps in knowledge are highlighted.

3.1 Population Status

Only two harbour porpoise populations have been evaluated “endangered” by the International Union for Conservation of Nature (IUCN); the population in the Baltic Sea (listed as “critically endangered”), and the Black Sea (listed as “endangered”). The population structure and extent of other harbour porpoise populations are less clear and they are listed as populations of “least concern” based on the fact that the harbour porpoise “is widespread and abundant”, and since conservation measures are being implemented in many areas (Hammond et al. 2008). However, as described below in sections “3.2 Population structure” and “3.3 Population abundance” the harbour porpoises inhabiting the western Baltic, the Belt Sea and the Kattegat should be considered as a separate population, and abundance estimates from 1994 and 2005 indicate a possible decline (Teilmann et al. 2011). Consequently, the sustainability of the population may be of concern, which was noted by the ICES Working Group for Marine Mammal Ecology (WGMME, Berlin 2011, ICES 2011) and the Jastarnia Group (Copenhagen 2011). Both groups recommended that a new survey should be carried out to determine the abundance and status of the population.

The harbour porpoise is listed on Annex II and IV of the EU Habitats Directive (92/43/EEC) which obliges all EU Member States to protect the species in its entire range as well as identify protected areas, named Special Areas of Conservation (SAC). Within the western Baltic, the Belt Sea and the Kattegat, Germany and Denmark have each designated 11 SACs where porpoises are listed (Germany 1,996 km^2, Denmark 2,075 km^2) (Fig. 2). Sweden is still in the process of designating SACs for harbour porpoises and has so far only identified two within the area of this plan (184 km^2). In relation to the designation of SACs, each Member State has to evaluate the elements of the conservation status that are important for harbour porpoises within each protected area. Germany lists its 11 areas as average or in reduced conservation (status C), Denmark lists five areas as having a good conservation status (Status B) and six as having an average or reduced conservation status (Status C), and Sweden list its two areas as having an excellent conservation status (Status A) (ICES 2011). The majority of the areas are therefore listed as being in a reduced conservation status (Fig. 2)”.

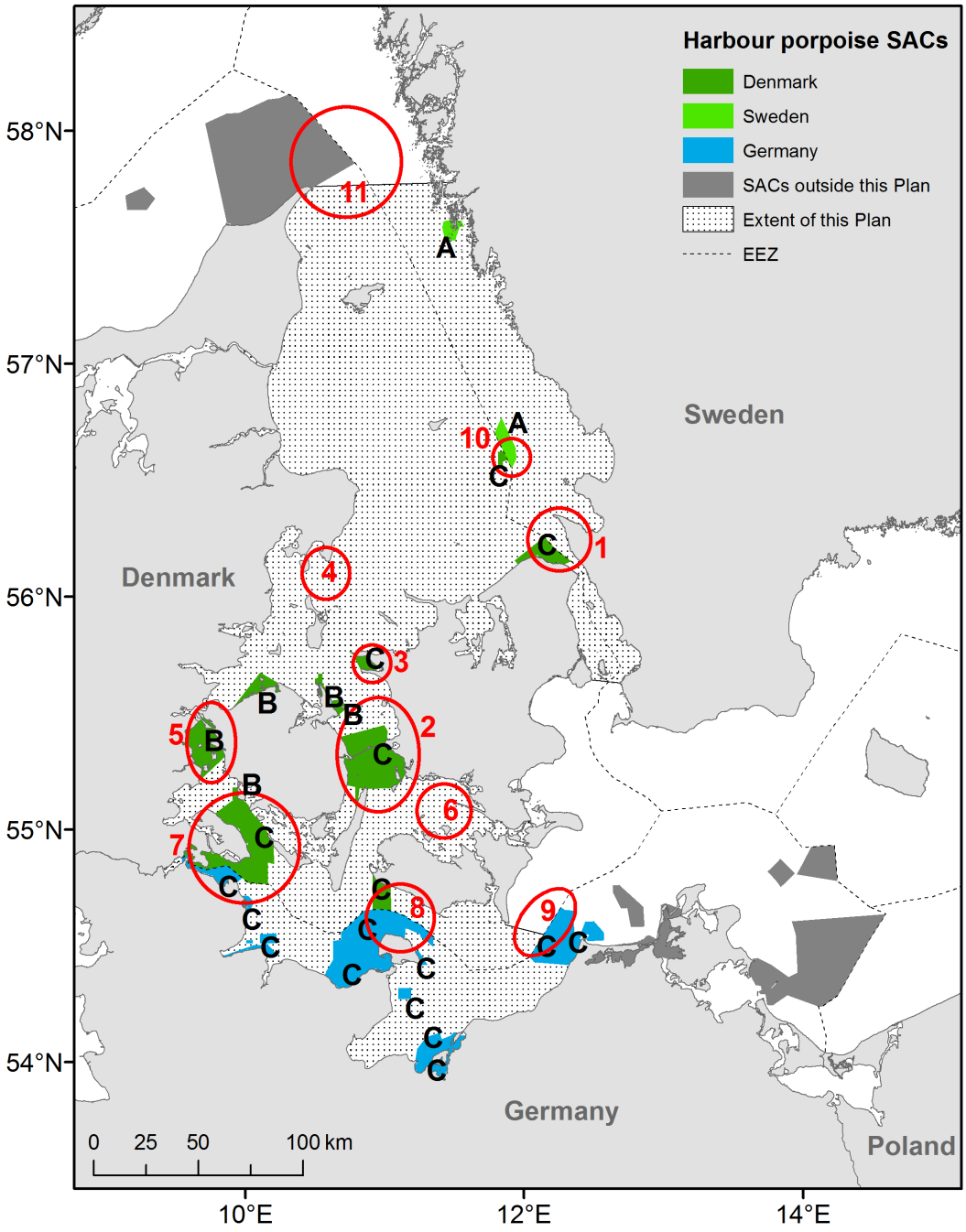

Figure 2 *Special Areas of Conservation (SACs) designated according to the EU Habitats Directive for harbour porpoises (i.e. where harbour porpoises are part of the selection criteria) by Denmark, Germany and Sweden within the western Baltic, the Belt Sea and Kattegat. Letters refer to the national assessment of conservation status of the elements important to harbour porpoises within each area: A) Excellent conservation, B) Good conservation and C) Average or reduced conservation status (from ICES WGMME report 2011 and http://eunis.eea.europa.eu/sites.jsp). Red circles indicate areas of high porpoise density identified by satellite tracking, surveys and passive acoustic monitoring: Northern Sound (1), Great Belt (2), Kalundborg Fjord (3), northern Samsø Belt (4), Little Belt (5), Smålandsfarvandet (6), Flensborg Fjord (7), Fehmarn Belt (8), Kadet Trench (9), Store Middelgrund (10) and Tip of Jutland (11). The order of the numbers is arbitrary.*

3.2 Population Structure

The harbour porpoise is divided into several populations throughout its range (Andersen 2003, Evans & Teilmann 2009, Lockyer & Kinze 2003). In the waters between the North Sea and the Baltic Sea, studies on satellite telemetry, genetics and morphology have identified three populations; one in the northern North Sea including the Skagerrak and the northern part of the Kattegat, one in the western Baltic, the Belt Sea and the Kattegat, and a third in the Baltic Proper (Andersen et al. 1997, Galatius et al. 2010, Teilmann et al. 2011, Wiemann et al. 2010). No exclusive geographical boundaries have been found between these three populations, and morphological studies and satellite tracking of porpoises show some degree of overlap in distribution in transition areas in the northern Kattegat (between 56°30'N - 57°30'N) and the south-eastern area around Fehmarn Belt, the Darss-Limhamn Ridge to latitude 14°E (Galatius et al. 2010, Teilmann et al. 2011).

3.3 Abundance

The abundance of harbour porpoises in northern European waters has been estimated twice based on internationally coordinated large scale dedicated surveys; SCANS (Small Cetacean Abundance in the North Sea and Adjacent waters) in 1994 (Hammond et al. 2002) and SCANS-II in 2005 (SCANS-II 2008). The population size was calculated to be 27,767 (CV = 0.45, 95% confidence interval (CI) = 11,946-64,549) in 1994 and 10,865 (CV=0.32, 95% CI = 5,840-20,214) in 2005. Although this represents a 60% decline in the point estimates, this difference is not statistically significant (due to the large coefficient of variation). However, Teilmann et al. (2011) project that with a continuous declining trend of 8% and the same CV and survey interval, the population might drop to 2,000 individuals before a statistically significant trend can be established. Action is therefore needed to ensure that a favourable conservation status is established for the western Baltic, the Belt Sea and the Kattegat harbour porpoise population should the current trend in abundance estimates persist.

3.4 Distribution

The harbour porpoises in the Western Baltic have been studied by means of visual surveys from boats and planes (Hammond et al. 2002, Heide-Jørgensen et al. 1992, Heide-Jørgensen et al. 1993, Siebert et al. 2006, Scheidat et al. 2008), detections of incidental sightings and strandings (Kinze et al. 2003, Siebert et al. 2006), passive acoustic monitoring (Verfuss et al. 2007), acoustic surveys (SCANS-II 2008, Sveegaard et al. 2011a) and satellite tracking (Sveegaard et al. 2011b, Teilmann et al. 2007). From these studies it is clear that the porpoises are not evenly distributed, but concentrate in certain high-density areas. These areas are presumably key habitats, defined as the parts of a species' range essential for day-to-day survival, as well as

for maintaining a healthy population growth rate. Areas that are regularly used for feeding, reproducing, raising calves, and migration are all part of key habitats (Hoyt 2005). Within the range of the western Baltic, the Belt Sea and the Kattegat population, the highest densities are found in the northern Sound, Great Belt, Kalundborg Fjord, northern Samsø Belt, Little Belt, Smålandsfarvandet, Flensborg Fjord, Fehmarn Belt, Kadet Trench and Store Middelgrund (**Fig. 2**).

The distribution of harbour porpoises and the location of high-density areas may vary seasonally, but current studies are not conclusive: satellite tracking and acoustic surveys of harbour porpoises have shown that during the winter the population moves either south i.e. out of the Kattegat and into the Belt Sea and the western Baltic or north out of the western Baltic, resulting in very low winter abundance in some of the summer high density areas, such as the Kattegat and the Sound (Sveegaard et al. 2011a, Sveegaard et al. 2011b). However, studies using passive acoustic monitoring show an increase in porpoise click activity in the German Baltic Sea, during the calving and mating seasons (spring and summer), and a subsequent decrease in winter time as well as a general increase in porpoise density from east to west (Verfuss et al. 2007). This trend is supported by data on strandings and incidental sightings (Siebert et al. 2006), whereas studies involving aerial surveys found no obvious seasonal patterns (Scheidat et al. 2008).

Seasonal changes in distribution may be related to reproduction, but so far no specific breeding areas have been identified in the western Baltic, the Belt Sea and the Kattegat. However, during the first SCANS survey and from opportunistic sightings and strandings, a high ratios of calves to adult porpoises were found in the Belt Sea (Hammond et al. 1995, Kinze 2003). Since the population inhabiting these waters is rather stationary it is likely that both birth (mainly in June and July) and conception (July-August) also occur in these waters (Sørensen & Kinze 1994). In Danish waters, the pregnancy rate has been found to be between 0.61 and 0.73 calves/adult female per year (Sørensen & Kinze 1994). The calves are nursed for 8-10 months (Lockyer & Kinze 2003).

3.5 Habitat preferences

The harbour porpoise is a small whale with consequently limited capacity for energy storage. It inhabits a cold environment, and must consequently feed daily to meet its energy requirements (Koopman 1998, Lockyer et al. 2003, Lockyer 2007). The distribution of harbour porpoises is therefore believed to follow the distribution of its main prey species (Koopman 1998, Santos et al. 2004). In the last few years, the number of studies examining drivers for harbour porpoise habitat selection has increased. Results indicate that porpoises may be influenced by the distribution of main prey species, prey diversity, frontal zones, depth and other environmental variables, although the influence of each factor appears to vary between different areas. Sveegaard (2011) found a significant positive correlation between the distributions of herring *(Clupea harengus*) and harbour porpoises in the Kattegat and the Skagerrak. In the Sound the seasonal distribution of harbour porpoises was reflected by a shift in consumption of prey species, diversity and abundance (Sveegaard et al. 2012). Consequently, prey distribution is of great importance in conservation plans.

The harbour porpoise consumes a wide range of prey species and does not rely on a single, narrow range of prey sizes (MacLeod et al. 2006). In the waters between the eastern North Sea and the Baltic Sea, the major

prey species during the last 25 years were found to be herring, sprat (*Sprattus sprattus*), cod (*Gadus morhua*), whiting (*Merlangius merlangus*), gobies (Gobiidae) and sandeels (Ammodytidae) (Aarefjord et al. 1995, Benke et al. 1998, Börjesson et al. 2003). The relative importance of these prey varies between regions and seasons (Benke et al. 1998, Santos & Pierce 2003).

3.6 Threats

All major known threats to the harbour porpoises in the western Baltic are human induced and the anthropogenic utilisation of marine areas is constantly increasing. If not controlled and mitigated, bycatch, bridges, tunnels, wind farms, dredging, overfishing and shipping are some of the activities that may negatively influence the porpoise population. Moreover, the background noise level in the sea is growing due to anthropogenic use of the sea, and since hearing is essential for harbour porpoises to find prey and potential mates, noise may have negative population effects and potentially cause chronic stress. Consequently, it is important that harbour porpoise populations are monitored not only locally for example in relation to new marine constructions or in SACs, but also at population level so that cumulative effects of various anthropogenic impacts on the marine environment may be revealed at both the local and the population level.

Bycatch

A major threat to the harbour porpoises in the western Baltic is incidental bycatch in gillnet fisheries (Carlström et al. 2009, Kock & Benke 1996, Lowry & Teilmann 1994). ASCOBANS advised that the maximum annual bycatch for harbour porpoises should not exceed 1.7% of the population size to be sustainable (Resolution No. 3, Incidental Take of Small Cetaceans, Bristol 2000) and the International Whaling Commission (IWC) stated that the flag of concern should be raised if the number of small cetaceans captured is greater than 1% of their total population size (Bjørge & Donovan 1995). However, assessing the actual levels of bycatch is difficult due to lack of information on bycatch rates and fishing effort of vessels below 15 m which make up the majority of the gillnet fishing in the western Baltic, the Belt Sea and the Kattegat, and a bycatch rate has never been estimated for this area. Bycatch is best studied by monitoring the net hauling, but a minimum estimate can be obtained from the number of stranded porpoises diagnosed as by-caught through post mortem analysis, although only a proportion of the bycatches may strand it may give an indication of the magnitude of the problem.

Germany has a comprehensive stranding network led by the Institute of Terrestrial and Aquatic Wildlife Research (ITAW) of the University of Veterinary Medicine in Hannover, which collects and examines the majority of reported bycaught and stranded porpoise carcasses along the German Baltic Sea. The number of strandings in the German Baltic has continuously increased since 2001 (Siebert et al. 2010), which may either reflect 1) an increased bycatch, 2) a general increase in porpoise abundance in the area, 3) a higher

mortality rate or 4) increased awareness leading to higher reporting rates (Siebert et al. 2010). By evaluating bycatch questionnaires from part-time fishermen and data on strandings, Rubsch & Kock (2004) estimated that part-time fishermen using gillnets were responsible for 27% of the estimated bycatch in German waters. Scheidat et al. (2008) applied the bycatch estimate by Rubsch and Kock (2004) to abundance estimates for the western Baltic Sea and showed that the percentage of porpoise bycatch in the south-western Baltic could lie within a range of 1.78 to 17.94% of the local abundance estimates for this area.

A proper estimate of the bycatch of porpoises have never been made in the western Baltic, Belt Sea and Kattegat. In Denmark, information on stranded porpoises, but without details on which presumably were bycaught, has systematically been collected since 1991 and the information on the stranded animals is gathered in a database and once a year the new results are published in a contingency plan. In 2000-2002 fewer than 50 porpoises were registered per year, but during 2003-2007 this number increased to an average of 113 harbour porpoises per year with a peak of 224 strandings in 2008 (Thøstesen et al. 2010).

In Sweden, Berggren (1994) used fishermen's reports to estimate the minimum bycatch of harbour porpoises in Swedish waters, between 1973 and 1993. The data showed a total of 169 bycaught porpoises in the period 1973-1988 and 297 in 1988-1991. During the period 1989-1991, 70% of the catches occurred in the Kattegat. Lunneryd et al. (2004) reported on the results of a telephone survey among Swedish Kattegat fishermen in 2001. They extrapolated the reported bycatch to an annual total bycatch of 114 porpoises.

It is essential to document and assess the magnitude of the bycatch in the western Baltic, the Belt Sea and the Kattegat, by either independent on-board observers, observers in a separate boat or video monitoring of net hauling at an appropriate sampling level to obtain reliable data. Onboard video monitoring has recently shown promising results as a reliable method of estimating bycatch (Kindt-Larsen et al. 2011). This method also accounts for porpoises which fall out of the net even before they are hauled onboard, which for any other method will lead to an underestimation of the bycatch (Kindt-Larsen & Dalskov 2010). In 2012, Denmark initiated a bycatch monitoring project aimed specifically at providing an estimate of the porpoise bycatch in the area covered by the plan.

Large efforts have been made to prevent bycatch. The only efficient method for mitigating bycatch (besides the reduction of fishing effort to zero) is the use of acoustic deterrent devices (so-called pingers), and their use is mandatory under current EU legislation. Pingers have proven to be efficient in decreasing bycatch levels (Larsen et al. 2002, Trippel et al. 1999), but the sounds emitted may deter the porpoises from the area (Carlström et al. 2009) and thus drive them out of a potentially critical habitat, e.g. an important foraging site or migration route. According to Article 2 (4) of Council Regulation No. 812/2004 "Member States shall take necessary steps to monitor and assess, by means of scientific studies or pilot projects, the effects of pinger use over time in the fisheries and areas concerned" (EU 2004), but so far, the results have not been conclusive (Barlow & Cameron 2003, Carlström et al. 2009, Cox et al. 2001, Dawson et al. 1998, Larsen et al. 2002, Palka et al. 2008). Additionally, the aspect of whether porpoises may habituate to pingers and thus may reduce pinger effectiveness over time is still unclear (Cox et al. 2001, Jørgensen 2006,

Teilmann et al. 2006). Another negative side effect of pingers is that they may work as a "dinner bell" to some seal and sea lion species (e.g. Caretta & Barlow 2011). This way seals may increase feeding on the fish caught in the gillnets. This will increase conflicts between seals and fishery and also potentially incease bycatch of seals.

Another strategy for bycatch mitigation is the replacement of high-risk gillnets with traps, pots and longlines. Different types of fishing gear have multiple impacts on the marine environment but studies have shown that e.g. fish traps do not only mitigate bycatch of cetaceans, they also have a lower discard rate than gillnets (Shester & Micheli 2011). Where possible, alternatives to gillnets should be promoted and implemented to reduce bycatch.

The only way to actually reduce gillnet effort while still maintaining a fishery is replacing gillnets with alternative fishing gear such as traps, pots and longlines that eliminates bycatch and yet allows fishermen to continue to make a living. Fishing gears have multiple impacts on the marine environment but studies have shown that e.g. fish traps do not only mitigate bycatch of cetaceans they are also considered sustainable and have for example lower discard rate than gillnets (Shester & Micheli 2011; Ovegård et al 2011). In many fisheries alternative fishing gear has been studied however not focused on finding an alternative fishing gear with the purpose to reduce bycatch. Most often the purpose has been to find alternatives more selective or more effective. Therefore there is a need to review and characterize gear alternatives in fisheries where marine mammal bycatch is severe. This implies a need for fisheries scientists and managers to include and focus on bycatch in their work. It is also an overarching recommendation that researchers needs to work with and fully understand the fishery being studied. This requires collaborations between scientists, industry, and fishery managers.

There are many factors that need to be considered when developing new fishing gear. For example there is a need for knowledge on the target species behaviour as well as the behaviour of other species. Also the fishing gears practicality and cost effectiveness has to be considered. Therefore the process is time-consuming and requires long-term commitment to careful experimentation, development and persistence on the part of managers and scientists is required. However there are many gillnet fisheries where there is an urgent need to replace gillnets and where there is a possibility to use alternative gear and in these fisheries the work needs to get started without delay.

Finally the implementation of new fishing gear frequently requires cultural shifts within fisheries. These shifts can be assisted by educational work, incentives (economic, market based, certifications, etc) and or regulations/enforcement.

In conclusion, the bycatch of harbour porpoises in the western Baltic, the Belt Sea and the Kattegat in gillnet fishery is currently of unknown, but possibly unsustainable magnitude. The most important obstacles in assessing and resolving the problem of bycatch are: 1) obtaining reliable data on the magnitude of the current bycatch, 2) the need for an abundance estimate with a reasonably narrow confidence interval, to be able to determine the status in relation to the 1.7 % maximum bycatch limit, 3) finding the best mitigation method for the fishery concerned, and 4) the lack of knowledge on types of

gillnet fisheries with bycatch of porpoises. In order to protect the population in the Western Baltic, the Belt Sea and the Kattegat, these points should receive the utmost attention.

Habitat degradation and food depletion

Habitat degradation may occur through noise, trawling, construction, shipping, pollution and extraction of marine resources like oil, boulders, sand and gravel. The cumulative effects of several noise sources may, by adding the disturbance effects from each source, exceed the tolerable level for porpoises. However, little is known about the behavioural and physiological effects on harbour porpoises of the major noise sources such as ship and boat traffic, construction work, seismic exploration, commercial sonars, depth finders, fisheries acoustics gear and acoustic deterrent and harassment devices. Only dedicated studies will be able to quantify the effects.

Major construction at sea has shown negative impacts on the distribution of porpoises. During the construction phase of the Nysted wind farm in the western Baltic a strong decrease in harbour porpoise presence up to 10 km away from the construction site was found (Carstensen et al. 2006). Subsequent monitoring of the operation phase showed that the negative effect persisted even after several years (Teilmann et al. 2009). In the North Sea studies of porpoise presence in areas of operating wind farms are ambiguous with recordings of both constant and increased densities inside the wind farm (Scheidat et al. 2011, Tougaard et al. 2006). Pile driving has been found to be the most disturbing activity during wind farm and other construction work causing a decrease in porpoise density up to 17 km away (Brandt et al. 2011, Tougaard et al. 2009). Consequently the effect of marine construction depend on the activity, importance of the area to the porpoises, prey availability, as well as the presence of other disturbing factors apart from noise.

Other important anthropogenic effects on the marine environment are overfishing and destruction of the sea bed (e.g. bottom trawling or dredging) resulting in decreasing availability of suitable prey items for porpoises (Hammond et al. 1995). Reijnders (1992) examined the changes in abundance and occurrence of harbour porpoises in the North Sea and found that changes in prey availability were one of the most significant factors determining distribution, along with changes in incidental bycatch. Prey availability was affected by limitations of herring and mackerel as the major food source, caused initially by overfishing and followed by a shift in spawning and feeding grounds. These results are consistent with the findings of Sveegaard (2011) that harbour porpoise distribution is correlated to distribution, diversity and abundance of prey. Hence, the distribution of fish stocks and of porpoises are undoubtedly linked to one another, and conservation of porpoises should thus also include management of fisheries especially in designated protected areas (SACs). In the western Baltic, the Belt Sea and the Kattegat the primary harbour porpoise prey species are cod and herring. In the Kattegat, the cod stock has undergone a substantial reduction over the past 25 years and both stock size and spawning stock biomass have remained at very low levels since the end of the 1990s (Vitale et al. 2008). This is most likely due to overfishing and habitat destruction by

towed fishing gears, since the adjacent Sound, where trawling has been banned for 70 years, has not been affected (Svedäng 2010).

Pollution

Anthropogenic contamination of the marine environment has increased dramatically in the past century, and the effects on marine mammals has caused concern (Hammond et al. 1995). Persistent organic pollutants (POPs) such as polychlorinated biphenyls, DDT, hexachlorbenzene (HCB), chlordanes (CHLs) have been used worldwide and are still found in high concentrations in wildlife long after restrictions on their use have been implemented (Letcher et al. 2010). Other compounds, such as polybrominateddiphenyl ethers (PBDEs) and polyfluorinated chemicals (PFCs) were restricted more recently while trends of increasing concentrations are still being detected in the environment (Galatius et al. 2011, Letcher et al. 2010). POPs accumulate in animal tissue and biomagnify through the food chains and therefore pose an obvious threat to the harbour porpoise as a top predator. Potential effects of POPs include reproductive failure, immunosuppression, disruption of endocrine systems, nervous system disorders and cancers.

POPs are suspected to cause reproductive failure and affect the immune system of seals in the Wadden Sea and Baltic Sea (Helle et al. 1976, Reijnders 1992). Since Kleivane et al. (1995) found organochlorine (OC) concentrations in harbour porpoises in Norwegian and Danish waters to to three times higher than corresponding OC levels detected in harbour seals (*Phoca vitulina*) from the same areas, there is reason to be concerned. Kuiken et al. (1994) found no significant correlation between levels of PCB, DDT and HCH and suppression of the immune system in harbour porpoises. Murphy et al. (2010) found indications for a link between higher POP concentrations and lower pregnancy rates in harbour porpoises. Weijs et al. (2010) have raised concern regarding the exposure of suckling porpoise calves to high levels of POPs.

Heavy metals are suspected to accumulate through the lifespan of marine mammals. Das et al. (2004) found that increasing zinc levels in harbour porpoises were observed with deteriorating health condition (emaciation and bronchopneumonia), while mercury increases were not correlated with health status. Siebert at al. (1999) found significant associations between mercury levels and severity of lesions with respect to the nutritional state of the cetaceans examined. Consequently, heavy metal may play an important role in the health status of harbour porpoises, but the studies also found that exposure levels of zinc and mercury were lower in the western Baltic compared to the North Sea. The Baltic levels may however still be harmful to the harbour porpoises in the western Baltic, the Belt Sea and the Kattegat and should be monitored.

3.7 Legal Status of the harbour porpoise in the Western Baltic

The harbour porpoise is listed in Annex II and IV of the Habitats Directive (92/43/EEC), Annex II of the Convention on the Conservation of European Wildlife and Natural Habitats (Bern Convention), Appendix II

of the Convention on the Conservation of Migratory Species of Wild Animals (CMS, Bonn Convention) and Annex II of the Convention on International Trade in Endangered Species (CITES), and it is covered by the Agreement on the Conservation of Small Cetaceans of the Baltic, North East Atlantic, Irish and North Seas (ASCOBANS), and by the Convention on the Protection of the Marine environment of the Baltic Sea (HELCOM).

Of the above listed legal instruments, the Habitats Directive has received the most attention in recent years due to the requirement to designate protected areas, known as Special Areas of Conservation (SACs). The porpoises must be protected within these areas and management plans must be developed. The management plans must ensure that the abundance of porpoises within each SAC is stable or increasing and further that the total abundance of harbour porpoises within national borders does not decline. Measuring the success of the management plans is essential and it is thus important to define clear measurable objectives in both the regional monitoring of SACs and in the monitoring of the entire population. Furthermore, the chosen monitoring methods should be kept consistent to reduce method-related variation and increase power in trend analysis (Berggren et al. 2008).

The harbour porpoise is also included in monitoring programmes of the EU Marine Strategy Framework Directive (MSFD) (2008/56/EC), which was formally adopted by the European Union in July 2008. The main goal of the MSFD is to maintain or restore a good environmental status (GES) by 2020 in all waters under EU Member States' jurisdiction. The MSFD sets out a strategy with key milestones which EU Member States must follow to achieve GES in their marine environment by 2020. These steps are: assessment of current ecological status and definition of GES and corresponding indicators (by 2012), establishment and implementation of monitoring programmes (by 2014), development and implementation of corrective measures (by 2016) and achievement of GES (by 2020). To achieve the aims of the Directive, Member States are to use existing regional institutional cooperation structures, including regional seas conventions.

In April 2004, in the framework of the Common Fisheries Policy (CFP), the EU adopted Council Regulation No. 812/2004 (EU, 2004). This regulation is aimed at reducing the incidental catch of cetaceans in fisheries in European Union waters. The regulation includes measures prohibiting Baltic Sea drift net fisheries, providing for mandatory use of acoustic deterrent devices (pingers) in some EU gillnet fisheries for vessels over 12 m in length, and the use of onboard observers on vessels of over 15 m in length. It is of relevance to the population in the western Baltic, the Belt Sea and the Kattegat that the regulation specifies (article 2.2, Annex 1) that the use of acoustic deterrent devices is mandatory in fisheries in ICES area IIIa for bottom set gillnets with net length up to 400m (1 Aug-31 Oct) and for bottom-set gillnets with mesh sizes > 220mm (all year). ICES areas 22 and 23 are however not covered by the regulation although these hold the highest densities of porpoises within the area. Furthermore, since the regulation is only applicable to vessels longer than 12 m, the majority of the current fishing fleet as well as all recreational fisheries are unregulated. The insufficiencies of Regulation 812/2004 were acknowledged and discussed by the Commission in its 2009 report on the implementation of the Regulation (COM (2009) 368 fin.) and again in the 2011 report on the same subject (COM (2011) 578 final).

Information on fishing effort is important in order to identify areas where intense fishing effort coincides with high porpoise density. From 1 January 2012, fishing boats with a length of > 12 m in all EU Member States are required to install a vessel monitoring system (VMS) which at regular intervals provides data to the fisheries authorities on the position, course and speed of vessels (Council Regulation No. 1224/2009). Prior to January 2012 this regulation was only valid for vessels >15 m, so perhaps this new regulation will provide a better geographical overview of the fishing effort. However, bycatch almost exclusively occurs in gillnets, and the VMS system for this fishery will only show where the boats go but provides no indication as to about gear type and effort.

Other international bodies that also provide relevant advice for harbour porpoise protection, includes the International Council for the Exploration of the Sea (ICES), which offers scientific advice relevant to the management of fish stocks and other species (including marine mammals) and the Scientific Committee of the International Whaling Commission (IWC). Although constrained from giving management advice regarding small cetaceans, the IWC has provided a forum for assessing the status of small cetacean species, including harbour porpoises.

For a description of the national authorities responsible for management of harbour porpoises as well as a list of research institutions and their current relevant research in Denmark, Germany and Sweden, see Appendix I.

4. Development of the Conservation Plan

The current status of the harbour porpoise population in the western Baltic is uncertain but abundance estimates as well as a lack of knowledge on bycatch rates give reason for concern. Consequently, the responsible national authorities are urged to follow the recommendations of this Plan.

This Plan aims to protect the harbour porpoise population in the western Baltic, the Belt Sea and the Kattegat and to restore and/or maintain the population at a favourable conservation status aiming for a population size at 80% or more of the carrying capacity (ASCOBANS, 1997), whereby:

1. population dynamics data will show that harbour porpoises are maintaining themselves at a level enabling their long-term survival as a viable component of the marine ecosystem;
2. the range of harbour porpoises is neither reduced, nor is it likely to be reduced in the foreseeable future; and
3. habitat of favourable quality is and will be available to maintain harbour porpoises in the long term;

The above aim can be achieved by following the recommendations of this Plan and by involving all stakeholders during its implementation.

Concerning the general lack of data in the area of concern for assessing the status of the species and the

magnitude of the threats it faces, but taking bycatch as the most important, the recommendations of the Plan are articulated around five main objectives:

a. Involvements of all stakeholders in the detailed implementation of the plan and its evaluation

b. Mitigation of the by-catch

c. Assessment of the level of bycatch

d. Monitoring the status of the population

e. Insuring an habitat quality favourable to the conservation of the species

5. Recommendations

The following recommendations constitute the ASCOBANS Conservation Plan for Harbour Porpoises in the in the western Baltic, the Belt Sea and the Kattegat.

Special Areas of Conservation (SACs) referred to in the following only include those SACs for which harbour porpoises are part of the selection criteria and where national authorities have not categorized the size and density of the population within the SAC to be non-significant according to the criteria in the Habitats Directive, hereinafter referred to as hpSACs. The SACs presently (March 2012) referred to are shown in fig. 2.

The recommendations are not written in any priority order, but each recommendation are given a priority (low-medium-high).

Recommendation 1: Protect harbour porpoises in their key habitats by allowing a zero bycatch in hpSACs

Objective b: Mitigation of the by-catch

Rationale: Harbour porpoises are exposed to bycatch in their entire range, but may be especially vulnerable in foraging areas where their attention is directed towards their prey. The hpSACs supposedly also hold the highest densities of harbour porpoises. The same amount of fishing effort will therefore pose a relatively higher risk of bycatch inside hpSACs than outside of hpSACs. Optimal protection should therefore be ensured within these areas. Since under the EU Habitat Directive each EU Member State has to develop management plans for the SACs by 2014, an immediate end to gillnet fishing causing bycatch i.e. by promoting alternative gear types, is recommended to be included in these national mamagement plans. Future research into resolving potential habitat exclusion and the long-term effectiveness of pingers, may provide alternative ways of achieving zero bycatch in SACs.

Action required*:*

- Development of national management plans for SACs.
- Agreements between the Parties concerned banning gillnet fishery and policing bans within SACs. Requisite national legislation.
- Promoting alternative fishing methods.

Actors*:* National authorities controlling fishery management, fisheries

Priority: High

Recommendation 2: Implement pinger use in fisheries causing bycatch outside hpSACs

Objective b: Mitigation of the by-catch

Rationale: Harbour porpoises have to be protected in their entire range in order to fulfil the objectives of this Plan and of the EU Habitats Directive. The main known threat for harbour porpoises is bycatch and consequently steps should be taken to prevent bycatch throughout their range.

Action required:

- Agreement between the Parties to immediately implement pingers in gillnet fishery associated with bycatch outside hpSACs irrespective of vessel size or type. Requisite national legislation.

- If certain gear types are proven by the fishermen and/or researchers not to induce bycatch, pingers should not be used with these gear types, in order to reduce the negative impact on the environment.

Actors: National authorities, fisheries

Priority: High

Recommendation 3: Estimate total annual bycatch

Objective c: Assessment of the level of bycatch

Rationale: No reliable estimate of bycatch in the area exists. In order to estimate the sustainability of the population, the annual bycatch needs to be estimated for all types of gillnet fisheries irrespective of vessel type/size (see Appendix I).

Action required:

- Monitoring of all type of gillnet fisheries for estimate bycatch rate in cooperation with fisheries
- Identify gear types, effort, seasons and geographical bycatch hotspots.

Actors: National authorities, fisheries, scientists

Priority: High

Recommendation 4: Estimate trends in total abundance of harbour porpoises in the western Baltic, the Belt Sea and the Kattegat

Objective d: Monitoring the status of the population

Rationale: The status of the population is unclear. To monitor the sustainability and assess trends in the population it is essential to conduct regular abundance surveys.

Action required:

- Conduct synoptic absolute abundance surveys regularly.

- To develop a survey interval based on power calculations in relation to effort and statistical uncertainty.
- The surveys should be coordinated between Denmark, Germany and Sweden. The method and timing of the surveys should be comparable to previous SCANS surveys.

Actors: Scientists, national authorities

Priority: High

Recommendation 5: Insure a non-detrimental use of pingers by examining habitat exclusion and long-term effect of pingers

Objective e: Insuring habitat quality

Rationale: Studies on the long-term deterrence effect and possible habituation to pingers are inconclusive. The long-term effectiveness of pingers to prevent bycatch and the potential habitat exclusion should be investigated. This is particularly important if pingers are used as the long-term solution to bycatch in gillnet fisheries. Furthermore, pingers are already mandatory in some gillnet fisheries operating in the area covered by this Plan without knowledge of the potential detrimental effects (ICES area IIIa).

Action required:

- Examine the habitat exclusion of harbour porpoises in large-scale gillnet fishery using pingers.
- Examine the long-term effectiveness in large-scale use of pingers not only in relation to harbour porpoise bycatch but in relation to other species, like seals.

Actors: EU, National authorities, Scientists

Priority: High

Recommendation 6: Replace gillnet fisheries known to be associated with high porpoise bycatch with alternative fishing gear known to be less harmful

Objective b: Mitigation of bycatch

Rationale: The use of fishing gear such as traps, pots, hooks and pound nets as an alternative to gillnets will reduce the gillnet effort, and thereby reduce the bycatch of harbour porpoises. At the same time the fisheries can remain viable, economically profitable and sustainable.

Action required:

- Test and implement alternative fishing gear
- Find incentives such as eco-labelling to switch to fishing gear without bycatch.
- Increase focus and promote the development of alternative fishing gear

Actors: National authorities in Denmark, Germany and Sweden, fisheries, scientists, NGOs, eco-labelling companies

Priority: High

Recommendation 7: Involve fishermen in the technical implementation of the mitigation measures to insure reducing bycatch.

Objective a and b: involvement of stakeholders & Mitigation of bycatch

Rationale: Reducing bycatch in fisheries involve fishermen. By developing regulations or creating incentives in cooperation with fishers, industry, scientists, NGO's and government managers the rate of success will most likely increase. This would help ensure the success of bycatch mitigation measures.

Action required:

- A working group including fishermen, scientists, representatives of governments and of environmental organisations should be established to develop guidelines and methods to reduce and monitor bycatch in relevant fisheries.
- ositive collaboration with fishermen should be promoted by supporting the environmental certification of fisheries. This could be achieved e.g. by helping the fishermen to reduce their bycatch, through the use of pingers or alternative fishing gear, or by documenting that specific fisheries have no bycatch of porpoises.

Actors: National authorities, fisheries and scientists in Denmark Germany and Sweden, the Industry, NGOs, eco-labelling companies

Priority: High

Recommendation 8: Include monitoring and management of important prey species in national harbour porpoise management plans

Objective e: Insuring habitat quality

Rationale: Distribution of harbour porpoises and of their prey is correlated and consequently important prey species should be considered in the management of harbour porpoises. This is particularly important in designated SACs, many of which are believed to constitute crucial foraging areas. Distribution and stock sustainability of prey species rely on antropogenic effects as well as different environmental factors and thus future management plans should therefore aim to focus at ecosystem level, e.g. by including prey distribution, abundance and habitat quality to understand porpoise distribution.

Action required:

- Data on preferred prey and prey communities should lead to sustainable management of these species either in SACs or in general to ensure favourable long-term conservation status for both the fish species and of harbour porpoises
- Cooperation between researchers and national authorities.
- Agreements between the Parties concerned on management of fisheries on relevant prey species. Requisite national legislation.
- Emphasis should also be given to the investigation of biology and distribution of non-commercial prey-species

Actors: Scientists, National authorities

Priority: Medium

Recommendation 9: Restoring or maintaining habitat quality

***Objective e*: Insuring habitat quality**

Rationale: Marine areas subjected to intense shipping and exploitation such as the western Baltic Sea are in danger of habitat degradation through fishery, noise, construction, shipping, pollution and resource extraction. This may diminish their suitability as habitats for harbour porpoises. It is therefore important to ensure that the quality of the habitat allows to supporting a viable harbour porpoise population.

Action required*:*

- Full implementation of the MSFD and relevant decisions by ASCOBANS, HELCOM, CMS and other relevant international bodies. Requisite national legislation.

Actors*:* National authorities

Priority: Medium

Recommendation 10: Monitor population health status and cause of mortality

Objective d: Monitoring the status of the population

Rationale: Annual sampling of stranded and bycaught harbour porpoises will help to determine if the population is exposed to pressures from bycatch, diseases, food depletion, parasite load, effects of pollution, physical effects of noise, etc. and whether this pressure changes over time. Although it is difficult to include mitigation of the effects of diseases and pollutants on harbour porpoises in management schemes, the regular necropsies of dead porpoises will provide invaluable knowledge on the general health of the population and which threats most urgently needs to be mitigated.

Action required:

- Collection of a sufficient number of stranded and/or bycaught harbour porpoises annually in each country: Denmark, Germany and Sweden.
- Conduct necropsies and examine cause of death, diseases, pollutant level and fitness using standard protocols.

Actors:

- The authorities in Denmark, Germany and Sweden should allocate funding for annual collection and necropsies of dead harbour porpoises and the information from all three countries should be gathered in a common database.
- Research institutions to conduct the necropsies

Priority: High

Recommendation 11: Cooperate with and inform other relevant bodies about the Conservation Plan

***Objective* a**. Involvements of all stakeholders in the detailed implementation of the plan and its evaluation

Rationale: Cooperation between ASCOBANS and other relevant regional and international players will contribute to achieving synergies, avoiding duplication of effort and promoting more efficient and result-oriented use of available resources.

Action required: Dissemination of the Conservation Plan for the Western Baltic, the Belt Sea and the Kattegat to the national governments of Denmark, Germany and Sweden as well as to HELCOM, ICES, European Commission, and other relevant bodies, including NGOs.

Actors: ASCOBANS Secretariat

Priority: High

5. Implementation and Re-evaluation of the Conservation Plan

This Conservation Plan is adopted without prejudice to the exclusive competence of the European Union for the conservation, management and exploitation of living aquatic resources. It is important that the Plan and the recommendations outlined within it be implemented without delay, and that ASCOBANS undertake a formal re-evaluation and revision of the Plan at least every five years. The next review should occur three years after the adoption of the Plan. It is also suggested that the authorities of Denmark, Germany and Sweden be asked to supply ASCOBANS with updated information, annually, concerning progress in implementation.

The actual implementation of this Plan falls within the remit of the Parties. [The Jastarnia Group/a Gap-area Group/the North Sea Steering Group/a combined group including all three Plans] will act as a Steering Group evaluating progress and the implementation, establishing further implementation priorities and making appropriate recommendations, and carrying out the periodic reviews.

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Wunschmann A, Siebert U, Frese K, Weiss R, Lockyer C, Heide-Jorgensen MP, Muller G, Baumgartner W (2001) Evidence of infectious diseases in harbour porpoises (Phocoena phocoena) hunted in the waters of Greenland and by-caught in the German North Sea and Baltic Sea. Veterinary Record 148:715-720

APPENDIX I - List of National authorities, research institutions and current research and initiatives related to harbour porpoises

Will be updated yearly at the Jastarnia meeting

Institutes of research and management in Denmark

Management

Danish Nature Agency (www.nst.dk), under the Danish Ministry of Environment. Responsible for management, international organisations and implementation of the EU Directives. Contact person: Maj Friis Munk. Phone: (+45) 72 54 30 00, e-mail: MFM@nst.dk

The Danish AgriFish Agency (www.agrifish.dk) under the Ministry of Food, Agriculture and Fisheries: Responsible for management of fisheries and its impact on the environment. Contact person: Anja Gadgård Boye. Phone: (+45) 72 18 85 43, e-mail: anbo@naturerhverv.dk

The Danish Energy Authority (www.ens.dk under the Danish Ministry of Energy): Responsible body for permissions/licenses regarding offshore activities such as oil and gas extraction and offshore wind energy, including impact on the environment. Contact person: Mette Cramer Buch, phone: (+45)33927572, e-mail: mcb@ens.dk

Fishery and Maritime Museum (www.fimus.dk/en/, Esbjerg). Collection of data on marine mammal strandings for the yearly contingency plan. Contact person: Lasse Fast Jensen, phone: (+45) 76 12 20 00, e-mail: lfj@fimus.dk

Current management Initiatives:

1. Establishment of guidelines for EIAs on sub-sea cable survey operations. Cooperation between ENS, Energinet.DK and Aarhus University. Establishment of noise exposure criteria for marine mammals and assessment of possible impact of sub-bottom profiling and other survey methods used for assessing the topmost layers of the seabed.
2. Baseline report on environmental status of marine areas, as required by the EU Marine Strategy Framework Directive. Cooperation between NST, DTU Aqua and Aarhus University. Review of existing data material in order to evaluate current environmental status of Danish waters with respect to the 11 descriptors described in the marine strategy framework directive.

Research

Fjord & Belt (www.fjord-baelt.dk). Aquarium in Kerteminde with 4 captive harbour porpoises. Contact person: Magnus Wahlberg, email: magnus@fjord-baelt.dk

Current research projects:

1. Behaviour
2. Growth in captivity

3. Echolocation, communication

Aarhus University, Department of Bioscience. The Roskilde Department is hired by Danish Nature Agency to conduct the surveillance of harbour porpoises according to the Habitats Directive. Conducts research on acoustics, distribution, anthropogenic effects, noise. Contact person: Jonas Teilmann, email: jte@dmu.dk. The Aarhus department conducts research on porpoise physiology and echolocation. Contact person : Peter Teglberg Madsen, email: peter.madsen@biology.au.dk

Current research projects:

1. Behavioural response to noise
2. Abundance surveys
3. Tagging (movements, diving behaviour, feeding behaviour)
4. Spatial modelling
5. Effects of chemical pollution
6. Feeding ecology (analyses of stomach contents)
7. Effects of offshore activities (e.g. offshore wind farms, seismic and military operations)
8. Temporary hearing threshold for harbour porpoises exposed to air gun/pile driving noise.

DTU Aqua – National Institute of Aquatic Resources, Technical University of Denmark (www.aqua.dtu.dk). Contact person: Finn Larsen, email: fl@aqua.dtu.dk, Lotte Kindt-Larsen, e-mail: lol@aqua.dtu.dk

Current research:

1. Monitoring cameras onboard 16 gillnetters in the Western Baltic from January 2012 and 13 month.

Natural History Museum of Denmark: skeleton samples of cetaceans and seals. Contact person: Abdi Hedayat, email: AHedayat@snm.ku.dk

Institutes of research and management in Germany

Management

Federal Agency for Nature Conservation (Bundesamt for Naturschutz: BfN)
http://www.bfn.de/habitatmare/en/impressum.php : Responsible for management and implementation of the EU Habitats Directive in the EEZ (12 nmi from the coast). Contact person: Jochen Krause, email: jochen.krause@bfn-vilm.de

Individual counties are responsible for management of the EU Habitats Directive 0-12 nmi from the coast.

Research

Institute of Terrestrial and Aquatic Wildlife Research (ITAW) of the University of Veterinary Medicine Hannover, Foundation, Germany. Contact person: Ursula Siebert, email: Ursula.Siebert@tiho-hannover.de & Anita Gilles, email: Anita.Gilles@tiho-hannover.de.

Current research projects:

1. Health Status

a) Clinical and morphological pathology, as well as auditory research
b) Endocrine system, immune system, reproductive system
c) Effects of parasitic, bacterial and viral infections (esp.: phocine distemper infections in seals)
d) Effects of chemical and acoustic environmental pollution

2. Habitat Use

a) Population estimates (aerial and shipboard surveys)
b) Towed hydrophone and stationary T-POD deployment (acoustic click detectors)
c) Telemetry of seals and porpoises for insight into behavioural patterns, orientation and feeding
d) Feeding ecology (analyses of stomach contents, fatty acids and stabile isotopes)
e) Spatial habitat modelling (based on hydrological and biological factors)

3. Impact of anthropogenic activities

a) Acoustic and chemical environmental pollution
b) Fisheries, sea traffic, tourism
c) Offshore activities (e.g. offshore construction of windfarms, seismic and military operations)
d) Climate change
e) Cumulative effects of all impacts named above

German Oceanographic Museum, Stralsund (www.ozeaneum.de/en/home.html). Contact person: Jens Koblitz, email: Jens.Koblitz@meeresmuseum.de

Current research projects:

1. Stress in harbour porpoises
2. Temporary hearing threshold for harbour porpoises exposed to air gun/pile driving noise. Cooperation with Aarhus University, Denmark.

Institutes of research and management in Sweden

Management

The Swedish Agency for Marine and Water Management (SwAM, Havs- ochvattenmyndigheten, http://www.havochvatten.se/) . Taking over marine responsibilities from the Swedish Environmental Protection Agency and some responsibilities from the National Board of Fisheries from July 1, 2011. Contact person: Erland Letteval , email: erland.lettevall@havochvatten.se

The Swedish Fishermen's Federation: Can impose supplementary regulations for its members. Contact person: Henrik Svenberg, email: henrik.svenberg@yrkesfiskarna.se

Swedish University of Agricultural Sciences (SLU, www.slu.se): Taking over responsibility for the research institutes at the previous National Board of Fisheries from July 1, 2011. Contact person: Sara Königson, email: sara.konigson@slu.se

Current research projects:

1. Alternative fishing gear to reduce bycatch
2. Bycatch estimations and distribution in Swedish fisheries

Swedish Species Information Center/ArtDatabanken (www.artdata.slu.se). Works with biodiversity, serving as the focal point for information on threatened species and biodiversity in Sweden. Its main tasks are to collect, evaluate and store the most important information about threatened and rare plant and animal species. A basic part of this work is to assess the types and degrees of threat, and to prepare the national Red List and Red Data Books. Contact person, ArtDatabanken: Martin Tjernberg, email: martin.tjernberg@slu.se

Research

Kolmårdens Djurpark (www.kolmarden.com): Contact person: Mats Amundin, email: mats.amundin@kolmarden.com

Current research projects:

1. SAMBAH – Static Acoustic Monitoring of the Baltic Sea Harbour Porpoise (www.sambah.org).

AquaBiota Water Research (http://www.aquabiota.se/): a Swedish subsidiary of the Norwegian Institute for Water Research (NIVA). AquaBiota is a non-profit research company that focuses primarily on marine issues. Contact persons: Ida Carlen (PhD student on marine mammals), email: ida.carlen@aquabiota.se & Julia Carlström, email: julia.carlstrom@aquabiota.se

Current research projects:

2. SAMBAH – Static Acoustic Monitoring of the Baltic Sea Harbour Porpoise (www.sambah.org).
3. Spatial distribution and modelling
4. Underwater noise and management

Swedish museum of Natural History (www.nrm.se). Responsible for collection of stranding and sightings data, collection of carcasses for necropsy, sampling for the Environmental Specimen Bank as well as environmental contaminant analyses and health status. Necropsies are performed in cooperation with the National Veterinary Institue (SVA). Contact person: Anna Roos, email: anna.roos@nrm.se

Swedish Defence Research Agency (www.foi.se). FOI is an assignment-based authority under the Ministry of Defence. The core activities are research, method and technology development, as well as studies for the use of defence and security. Contact person: Torbjörn Johansson, email: torbjorn.johansson@foi.se

Current research projects:

1. Underwater noise

APPENDIX II - list of relevant reports (grey literature)

Denmark

Andreasen H. (2009). Marsvinets (Phocoenaphocoena) rolle som prædator i de danske farvande. PhD thesis. University of Copenhagen, 97 pp

Sveegaard S. (2011). Spatial and temporal distribution of harbour porpoises in relation to their prey. PhD Thesis. National Environmental Research Institute, Aarhus University, Denmark.

Teilmann, J., Dietz, R., Larsen, F., Desportes, G., Geertsen, B.M., Andersen, L.W., Aastrup, P., Hansen, J.R. & Buholzer, L. 2004: Satellitsporing af marsvin i danske og tilstødende farvande. Danmarks Miljøundersøgelser. 86 s. – Scientific report from NERI no. 484

Teilmann, J., Sveegaard, S., Dietz, R., Petersen, I.K., Berggren, P. & Desportes, G. 2008: High densityareas for harbourporpoises in Danish waters. National Environmental Research Institute, University of Aarhus. 84 pp. – Scientific report from NERI no. 657.

Germany

Danehl, S. (2011). Entwicklung von Schweinswal-Strandfunden und Beifängen (Phocoenaphocoena) an der deutschenOstseeküste von 1990 bis 2010. Bachelor thesis, University of Kiel, 47 pp.

Hasselmeier, I., Danehl, S., Gilles, A., Siebert, U. (2011). Schweinswale und Seevögel der Ostsee - Vorschlägefür die Reduzierung von Beifängen in passivenFanggeräten und die systematischeErfassung von Beifängen – PILOTSTUDIE. TeilberichtSchweinswale, p 4-43 (submitted BfN)

Herr, H. (2009). Vorkommen von Schweinswalen (Phocoenaphocoena) in Nord- und Ostsee– imKonfliktmitSchifffahrt und Fischerei?Dissertation (doctoral thesis).Universität Hamburg, 118 pp

Gilles, A., Peschko, V., Siebert, U. (2011). Monitoringbericht 2010-2011. Marine Säugetiere und Seevögel in der deutschen AWZ von Nord- und Ostsee.Teilbericht marine Säugetiere - VisuelleErfassung von Schweinswalen.Endberichtfür das BundesamtfürNaturschutz, p 5-87. (submittedBfN) - A yearly report on monitoring of abundance, distribution and habitat use of marine mammals in the German offshore waters under Natura2000

Gilles, A., Siebert, U. (2009). Erprobungeines Bund/Länder-Fachvorschlagsfür das Deutsche Meeresmonitoring von Seevögeln und SchweinswalenalsGrundlagefür die Erfüllung der Natura 2000 - BerichtspflichtenmiteinemSchwerpunkt in der deutschen AWZ von Nord- und Ostsee (FFH-Berichtsperiode 2007-2012) - TeilberichtSchweinswale. VisuelleErfassung von Schweinswalen. Endberichtfür das BundesamtfürNaturschutz, p 5-30; http://www.bfn.de/habitatmare/de/downloads/monitoring/BfN-Monitoring_MarineSaeugetiere_2008-2009.pdf - A yearly report on monitoring of abundance, distribution and habitat use of marine mammals in the German offshore waters under Natura2000.

Gilles, A. (2009). Characterisation of harbour porpoise (Phocoenaphocoena) habitat in German waters.Dissertation (doctoral thesis).Christian-Albrechts-Universitätzu Kiel, 151 pp.

Gilles, A., Andreasen, H., Müller, S., Siebert, U. (2008). Nahrungsökologie von marinen Säugetieren und Seevögelnfür das Management von NATURA 2000 Gebieten. Teilvorhaben: Marine Säugetiere. Endberichtfür das BundesamtfürNaturschutz. F+E Vorhaben FKZ: 805 85 018. 65 pp.

Prahl, S., Kuhn, E., Gaethke, U., Frankenberg, A., Ludwig, M., Siebert, U. (2005). Pilotprojekt zur „akustischenBelastung von Schweinswalen“. Endbericht an das BundesministeriumfürVerbraucherschutz, Ernährung und Landwirtschaft, 65 pp

Rubsch S, Kock KH. (2004). German part-time fishermen in the Baltic Sea and their bycatch of harbour porpoise. ASCOBANS 11th Advisory Meeting, JastrzebiaGóra, 27–29 April, 2004. Doc AC11/Doc10 (P) www.service- board.de/ascobans_neu/files/ac11-10.pdf

Seibel, H., Siebert, U. (2010). Untersuchung undBeurteilungevtl. Belastungdurch Pinger (akustischeVergrämer) auf das Gehör von Schweinswalen in der EU-Fischerei. Endbericht an das BundesministeriumfürVerbraucherschutz, Ernährung und Landwirtschaft, 122 pp

Siebert, U., Seibel, H., Lehnert, K., Hasselmeier, I., Müller, S., Schmidt, K., Sundermeyer, J., Rademaker, M., Peschko, V., Rosenberger, T. & S. Wingberg (2010). Totfundmonitoring von Kleinwalen und Kegelrobben in Schleswig-Holstein 2009. Bericht an das Ministerium fürLandwirtschaft, Umwelt und ländlicheRäume des Landes Schleswig-Holstein. 48 pp. - a yearly report on stranded marine mammals.

Sweden

Österblom H. (2002). Bifångster i fiskeredskap av fågel, sälochtumlare iÖstersjön. Naturhistoriskariksmuseet, Stockholm. 25 s. – *Bycatch in fishery of birds, seals and harbour porpoises in the Baltic.*

Lunneryd SG, Königson S. Sjöberg N B. (2004). Bifångstavsäl, tumlareochfåglar i detsvenskayrkesfisket (By-catch of seals, harbour porpoises and birds in Swedish commercial fisheries).In Swedish with an English summary.Fiskeriverket, Göteborg, Sweden.

Königson, S. 2008. Åtgärdsprogramförtumlare 2008–2013 (Phocoena phocoena). Julia Carlströmoch Christina Rappe, Naturvårdsverket,Fiskeriverket. – *National management program for harbour porpoises.*

Lindahl U, Rappe C. (2003). Åtgärdsprogramförtumlare (Phocoenaphocoena).- Naturvårdsverket, Åtgärdsprogram– *National management program for harbour porpoises.*

Carlén I, Isaeus M. (2007). Distribution of harbour porpoise prey species in the Baltic Sea. KolmårdensDjurpark / Naturvårdsverket.

Other

Hammond PS, Bearzi G, Bjørge A, Forney K, Karczmarski L, Kasuaya T, Perrin WF, Scott MD, Wang JY, Wells RS, Wilson B. (2008). *Phocoena phocoena (Baltic Sea subpopulation)*. In: IUCN 2011. IUCN Red List of Threatened Species. Version 2011.2.

HELCOM (2010). Hazardous substances in the Baltic Sea. Baltic Sea Environment Proceedings No. 120B, 119 pp.

Jastarnia Plan. http://www.ascobans.org/pdf/ASCOBANS_JastarniaPlan_MOP6.pdf

ASCOBANS. 2010. ASCOBANS Conservation Plan for Harbour Porpoises (Phocoena phocoena L.) in the North Sea. http://www.ascobans.org/pdf/ASCOBANS_NorthSeaPlan_MOP6.pdf

EU Legislation

EU (2004) COUNCIL REGULATION (EC) No 812/2004 of 26 April 2004 laying down measures concerning incidental catches of cetaceans in fisheries and amending Regulation(EC) No 88/98. http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2004:150:0012:0031:EN:PDF

EU (1992) Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora (The Habitat Directive) http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:1992:206:0007:0050:EN:PDF

EU (2008) DIRECTIVE 2008/56/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 17 June 2008 establishing a framework for community action in the field of marine environmental policy (MarineStrategy Framework Directive)

EU (2009) COUNCIL REGULATION (EC) No 1224/2009of 20 November 2009establishing a Community control system for ensuring compliance with the rules of the common fisheries policy