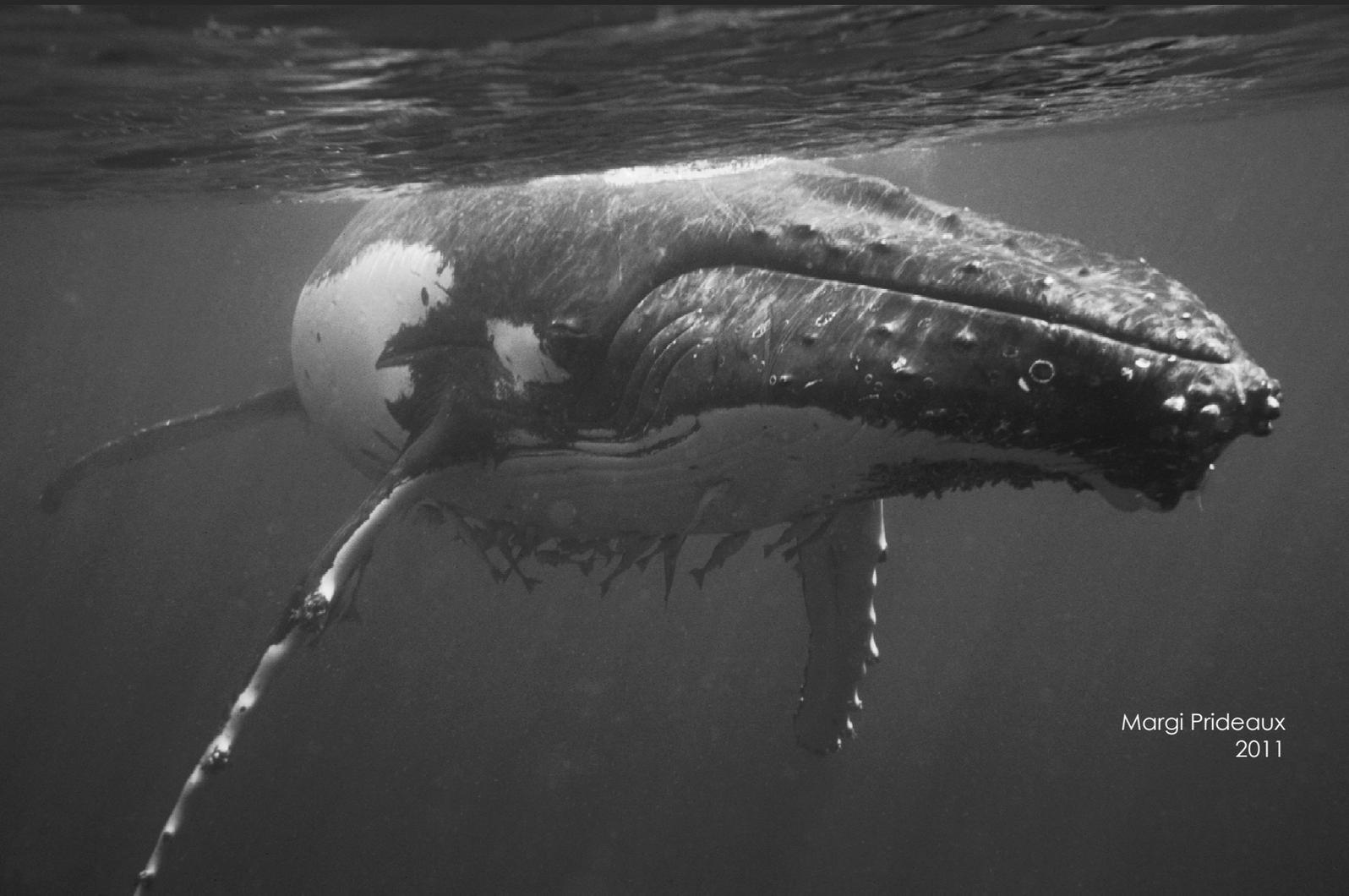


Convention on Migratory Species of Wild Animals

Towards a CMS Global Programme of Work for Cetaceans

Implementing CMS Resolution 8.22: Adverse Human Induced Impacts on Cetaceans



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All errors, omissions and content remain the sole responsibility of the author.



Towards a CMS Global Programme of Work for Cetaceans

Implementing CMS Resolution 8.22: Adverse Human Induced Impacts on Cetaceans

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Acronyms

ACCOBAMS	Agreement on the Conservation of Cetaceans of the Black Sea, Mediterranean Sea and Contiguous Atlantic Area	NOWPAP	Action Plan for the Protection, Management and Development of the Marine and Coastal Environment of the Northwest Pacific Region
AEPS	Arctic Environmental Protection Strategy	NSF	US National Science Foundation
AMWG	CMS Scientific Council Aquatic Mammals Working Group	OPRC	International Convention on Oil Pollution Preparedness, Response and Co-operation
ASCOBANS	Agreement on the Conservation of Small Cetaceans of the Baltic, North East Atlantic, Irish and North Seas	OSPAR	Convention for the Protection of the Marine Environment of the North-East Atlantic
CBD	Convention on Biological Diversity	PCBs	Polychlorinated biphenyls (PCBs)
CCAMLR	Commission for the Conservation of Antarctic Marine Living Resources	PCDDs	Polychlorinated dibenzo-p-dioxins
CCSBT	Commission for the Conservation of Southern Bluefin Tuna	PCDFs	Polychlorinated dibenzofurans
CITES	Convention on International Trade in Endangered Species of Wild Flora and Fauna	PERSGA	Regional Organization for the Conservation of the Environment of the Red Sea and Gulf of Aden
CO2	carbon dioxide	RFMOs	Regional Fisheries Management Organizations
COBSEA	Coordinating Body on the Seas of East Asia	ROPME	Regional Organization for the Protection of the Marine Environment
COFI	Committee on Fisheries Industries	SBSTTA	Subsidiary Body on Scientific, Technical and Technological Advice
COP	Conference of the Parties	SOCEP	Australian Southern Ocean Cetacean Ecosystem Program
DDT	Dichloro-Diphenyl-Trichloroethane	SOCER	State of the Cetacean Report
DNA	Deoxyribonucleic acid	SOFIA	State of World Fisheries and Aquaculture
EEZs	Exclusive Economic Zones	SO-GLOBEC	Southern Ocean Global Ecosystem Dynamics Program
FAO	United Nations Food and Agricultural Organization	SPAMI	Specially Protected Areas of Mediterranean Importance
GI WACAF	Global Initiative for West and Central Africa	SPAW	Protocol Concerning Specially Protected Areas and Wildlife
HBCDs	Hexabromocyclododecanes	UNEP	United Nations Environment Programme
HELCOM	Convention on the Protection of the Marine Environment of the Baltic Sea Area	UNGA	United Nations General Assembly
IATTC	Inter-American Tropical Tuna Commission	UNICPOLOS	United Nations Informal Consultation on Protection of the Oceans and the Law of the Sea
ICCAT	International Commission for the Conservation of Atlantic Tunas	WAF CET	West African Cetaceans Research and Conservation Programme
IMO	International Maritime Organization	WCPFC	Western and Central Pacific Fisheries Commission
IOTC	Indian Ocean Tuna Commission	WGRI	Ad Hoc Open-ended Working Group on Review of Implementation of the Convention
IPCC	Intergovernmental Panel on Climate Change	WHMSI	Western Hemisphere Migratory Species Initiative
IPIECA	International Petroleum Industry Environmental Conservation Association		
IUCN	International Union for the Conservation of Nature		
IWC	International Whaling Commission		
IWC CC	International Whaling Commission Conservation Committee		
IWC SC	International Whaling Commission Scientific Committee		
LDC	Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter		
MARPOL	International Convention for the Prevention of Pollution from Ships		
MEAs	Multilateral Environmental Agreements		
MEPC	Marine Environment Protection Committee		
MOP	Meeting of the Parties		
MOU	Memorandum of Understanding		
MPAs	Marine Protected Areas		
NAMMCO	North Atlantic Marine Mammal Commission		
NBSAPs	National Biodiversity Strategies and Action Plans		
NDFs	non-detriment findings		

Towards a CMS Global Programme of Work for Cetaceans

Implementing CMS Resolution 8.22: Adverse Human Induced Impacts on Cetaceans

Executive Summary

1. Marine cetaceans live within a vast aquatic environment that covers over 71% of the Earth's surface. Their habitats are foreign to humans, comprising extensive submerged landscapes of mountain ranges, plains, volcanoes and deep trenches; often eclipsing the size or majesty of many of their terrestrial counterparts. Driven by massive and layered currents and counter-currents, channels and columns of water, the ocean mass is a complex three dimensional environment. Within this complex environment are the migratory pathways and habitats of marine species - the living threads that weave throughout currents, channels, columns and basins; living conduits between separated ecosystems and habitats.
2. River cetaceans live in dynamic running water systems that emphasize terrestrial and upstream-downstream connectivity. Their habitat is generally more familiar to humans compared with cetacean habitat in marine environments; together the Ganges and Yangtze River basins, in addition to supporting endangered cetaceans, sustain roughly 25 percent of the people living on Earth today. The habitat of these animals undergoes dramatic changes seasonally, expanding during high-water periods into small tributaries, appended lakes and sometimes flooded forests. The sensitivity of riverine environments to altered flow regimes caused by engineering structures and a changing climate pose particular challenges for protecting priority habitat, where the animals find refuge from downstream and tidal currents, and movement corridors along the main river course that connect these patchily distributed areas.
3. This review examines the progress and intent of CMS and its agreements to date and offers advice on how the CMS Family can be more effective through strong collaboration with other relevant Multi-lateral Environmental Agreements (MEAs) such as the International Maritime Organization (IMO), the International Whaling Commission (IWC) and its Scientific Committee (IWC SC) and Conservation Committee (IWC CC), the Convention for the Protection of the Marine Environment of the North-East Atlantic (OSPAR), the United Nations Informal Consultation on Protection of the Oceans and the Law of the Sea (UNICPOLOS), the Cartagena Convention, European Union Habitats and Species Directive, the Bern Convention and the United Nations Environment Programme (UNEP) Regional Seas Programme.
4. Noting that *Resolution 8.22* requires the identification of priority impacts and priority regions, this report first identifies and describes what impacts are known in large oceanic regions (Section II). This information is then built upon by reviewing the extent to which CMS and CMS cetacean-related Agreements are addressing the listed impacts through their threat abatement activities (Section III), and then reviewing where the policy bodies of the reviewed MEAs are addressing threat abatement activities (Section IV). This information then provides the basis for an analysis of the gaps and overlaps among these bodies (Section V). The final section (Section VI) of this review proposes a draft programme of work, identifying CMS's own priorities, determining what collaboration and synergies are possible with other MEAs and suggesting mechanisms that might be developed to facilitate these priorities over the period 2012-2024 and providing a means of assessing the resources that will be necessary to complete this work
5. The summary recommendations for the Global Programme of Work for Cetaceans include:
 - a. an expanded strategic role for the Scientific Council's Aquatic Mammals Working Group (AMWG), chaired by the CMS Appointed Councillor for Aquatic Mammals is proposed to provide specific advice and reporting to support the Global Programme of Work for Cetaceans.
 - b. at a global policy level, greater cooperation and collaboration is suggested with the United Nations Food and Agricultural Organization (FAO) and its Committee on Fisheries Industries (COFI) for overarching fisheries and bycatch policy development; UNICPOLOS and other United Nations General Assembly high seas dialogues to define and establish the contribution CMS can make in high seas species conservation; the Convention on International Trade in Endangered Species of Wild Flora and Fauna (CITES) to support and complement the conservation activities of each convention; and the IWC SC and IWC CC to increase direct collaboration on issues of shared concern and especially concerning any IWC decisions that might impact on CMS Appendix I listed species.
 - c. in the North East Atlantic Ocean:
 - i. a focus on entanglement and bycatch, pollution and noise pollution is proposed;

- ii. greater cooperation and collaboration is suggested with the Bern Convention, Convention for the Protection of the Marine Environment of the North-East Atlantic (OSPAR) and IMO and with relevant Regional Fisheries Management Organizations (RFMOs); and
 - iii. Agreement on the Conservation of Small Cetaceans of the Baltic, North East Atlantic, Irish and North Seas (ASCOBANS) Parties might consider extending the ASCOBANS region geographically to encompass the whole of the regional range of the 15 CMS Appendix listed species and the mandate of ASCOBANS to cover the great whales.
- d. in the Mediterranean and Black Seas:
 - i. a focus on entanglement and bycatch (including driftnet fisheries), pollution and habitat and feeding ground degradation is proposed; and
 - ii. greater cooperation and collaboration are suggested with the Bern Convention, the Barcelona Convention, the Bucharest Convention, OSPAR and IMO.
- e. in Central and South East Atlantic Ocean (Western Africa):
 - i. a focus on entanglement and bycatch and marine bushmeat (other impediments to migration) is proposed;
 - ii. greater cooperation and collaboration are suggested with the UNEP Regional Seas Programme and the Abidjan Convention and with relevant RFMOs;
 - iii. an approach CITES to discuss cooperative support for addressing marine bushmeat as a regional issue is suggested; and
 - iv. Western African Aquatic Mammals Memorandum of Understanding (MOU) Signatories are encouraged to extend the agreement area of the Western African Aquatic Mammals MOU to encompass the high seas area of this region and to extend the scope of the agreement to include the great whales.
- f. in the North West Atlantic Ocean (Atlantic North America and the Caribbean):
 - i. a focus on bycatch, ship strikes and marine noise is proposed; and
 - ii. greater cooperation and collaboration are suggested with the UNEP Regional Seas Programme, the Western Hemisphere Migratory Species Initiative (WHMSI), the Cartagena Convention and SPAW, as well as with relevant RFMOs including the International Commission for the Conservation of Atlantic Tunas (ICCAT).
- g. in the South West Atlantic Ocean (Atlantic Latin America):
 - i. a focus on entanglement and bycatch and marine bushmeat (other impediments to migration) is proposed; and
 - ii. greater cooperation and collaboration are suggested with WHMSI to deliver a regional Action Plan for the CMS species of Latin America, as well as relevant RFMOs including ICCAT.
- h. in Central and North East Pacific Ocean (Pacific North America and Eastern Tropical Pacific):
 - i. a focus on entanglement and bycatch, marine noise and habitat and feeding ground degradation is proposed; and
 - ii. greater cooperation and collaboration are suggested with WHMSI, as well as relevant RFMOs including Inter-American Tropical Tuna Commission (IATTC).
- i. in the South East Pacific Ocean (Pacific Latin America):
 - i. a focus on entanglement and bycatch and marine bushmeat (other impediments to migration) is proposed; and
 - ii. greater cooperation and collaboration are suggested with WHMSI and with relevant RFMOs, including IATTC.
- j. in the Central and North West Pacific Ocean (East and South East Asia):
 - i. a focus on entanglement and bycatch and whaling and other directed hunts (other impediments to migration), pollution and habitat and feeding ground degradation is proposed;
 - ii. the need for the negotiation of a regional agreement for cetaceans in South East Asia is reaffirmed; and
 - iii. greater cooperation and collaboration are suggested with relevant RFMOs, including IATTC and the Western and Central Pacific Fisheries Commission (WCPFC).
- k. in the Pacific Islands Region:
 - i. a focus on entanglement and bycatch and habitat and feeding ground degradation is proposed; and
 - ii. greater cooperation and collaboration are suggested with relevant RFMOs, including IATTC, the Commission for the Conservation of Southern Bluefin Tuna (CCSBT) and WCPFC.

- l. in the Indian Ocean:
 - i. a focus on entanglement and bycatch, pollution, marine bushmeat habitat and feeding ground degradation is proposed; and
 - ii. greater cooperation and collaboration are suggested with the Nairobi Convention, ROMPE and PERSGA and with relevant RFMOs, including the Indian Ocean Tuna Commission (IOTC).
 - m. in the Arctic Seas:
 - i. a focus on climate change, habitat and feeding ground degradation, marine noise and hunting (other impediments to migration) is proposed.
 - n. in the Southern Ocean and Antarctic Seas:
 - i. a focus on climate change, habitat and feeding ground degradation and whaling (other impediments to migration) is proposed; and
6. greater cooperation and collaboration are suggested with the Commission for the Conservation of Antarctic Marine Living Resources (CCAMLR). The full proposed work programme is contained in Section VI: Collaboration, synergy and a CMS Global Programme of Work for Cetaceans.
7. In addressing the future of cetacean conservation and protection it is important to ensure synergy and compatibility between international instruments and to reduce the burden on States that may result from duplication of reporting and compliance effort. Collaboration and cooperation between CMS and other MEAs is therefore crucial. The review's purpose is to provide a snapshot of broadly what is known in order to inform such institutional networking. It is expected that Parties to CMS will apply a layer of political analysis before reaching conclusions.

Towards a CMS Global Programme of Work for Cetaceans

Implementing CMS Resolution 8.22: Adverse Human Induced Impacts on Cetaceans

I. Introduction

8. It is increasingly clear that cetaceans (whales, dolphins and porpoises) contend with a wide range of historic, contemporary and emerging threats in a rapidly changing world. Their highly mobile and often seasonally migratory nature sees them crossing through multiple jurisdictions and experiencing multiple impacts during their travels. It is obvious therefore that effective conservation and protection of these species can only be achieved by means of international cooperation. The Convention on the Conservation of Migratory Species of Wild Animals (CMS) and its cetacean-related agreements offer an important suite of instruments for cetacean conservation and protection.

9. CMS operates within the context of the five global-biodiversity-related conventions (also known as the 'biodiversity cluster'), which also includes the Convention on Biological Diversity (CBD), World Heritage Convention, Ramsar Convention on Wetlands (Ramsar) and the Convention on International Trade in Endangered Species of Wild Flora and Fauna (CITES). CMS contributes to global biodiversity conservation effort by conserving and managing avian, aquatic and terrestrial migratory species as well as their habitats throughout their range.

10. CMS supports strict protection for endangered species, encourages the conclusion of multilateral agreements for species and species groups with an unfavourable conservation status, and promotes co-operative research and conservation activities.

11. This review responds to the direction of *Resolution 8.22: Adverse Human Induced Impacts on Cetaceans* and examines the progress and intent of CMS and its agreements to date and offers advice on how the CMS family can be more effective through strong collaboration with specific Multilateral Environmental Agreements (MEAs) including the International Maritime Organization (IMO), the International Whaling Commission (IWC) and its Scientific Committee (IWC SC) and Conservation Committee (IWC CC), the Convention for the Protection of the Marine Environment of the North-East Atlantic (OSPAR), the United Nations Informal Consultation on Protection of the Oceans and the Law of the Sea (UNICPOLOS), the Cartagena Convention, European Union Habitats and Species Directive, the Bern Convention and the United Nations Environment Programme (UNEP) Regional Seas Programme.

12. In addressing the future of cetacean conservation and protection it is important to ensure synergy and compatibility between international instruments and to reduce the burden on States that may result from duplication of reporting and compliance effort. Collaboration and cooperation between CMS and these MEAs are therefore critical.

I (a) Challenges posed by migratory marine and riverine species

13. Marine cetaceans live within a vast aquatic environment that covers over 71 per cent of the Earth's surface. Their habitats are foreign to humans, comprising extensive submerged landscapes of mountain ranges, plains, volcanoes and deep trenches; often eclipsing the size or majesty of many of their terrestrial counterparts. Driven by massive and layered currents and counter-currents, channels and columns of water, the ocean mass is a complex three dimensional environment. Within this complex environment are the migratory pathways and habitats of marine species - the living threads that weave throughout currents, channels, columns and basins; living conduits between separated ecosystems and habitats.

14. River cetaceans live in dynamic running water systems that emphasize terrestrial and upstream-downstream connectivity. Their habitat is generally more familiar to humans compared to cetacean habitat in marine environments; together the Ganges and Yangtze River basins, in addition to supporting endangered cetaceans, sustain roughly 25 per cent of the people living on earth today. The habitat of these animals undergoes dramatic changes seasonally, expanding during high-water periods into small tributaries, appended lakes and sometimes flooded forests. The sensitivity of riverine environments to altered flow regimes caused by engineering structures and a changing climate pose particular challenges for protecting priority habitat, where the animals find refuge from downstream and tidal currents, and movement corridors along the main river course that connect these patchily distributed areas.

15. Where riverine and many coastal species and populations have more restricted ranges and specific habitats that may be fixed, predictable and visible to a degree, the habitats of many pelagic species and populations are characterized to a greater extent by ocean characteristics rather than geography. For example,

feeding areas depend on seasonal and shifting upwelling of nutrients or other ever-changing ocean conditions. (Hyrenbach et al., 2000; Hoyt, 2005; Reeves, 2009)

16. Cold-, warm- and tropical-water cetacean species and populations are usually recognized with distinct and sometimes overlapping distributions, yet some species and populations use more than one primary habitat during different parts of their regular migrations. Although there are resident populations of cetaceans in every climate there are also many species and populations that utilize quite dramatically different habitats for different parts of their life cycle. Being long-lived and social animals also allows for 'remembering' where to find critical habitat during different oceanic conditions both short term (as in El Niño events) or long term (as in decadal regime shifts). These include the many large whales that typically breed in warm tropical waters but feed mainly, after their long migrations, in polar seas, or some populations of killer whales (*Orcinus orca*) who use multiple feeding grounds as they follow prey along a migration route.

17. The migrations of many marine species are cyclical and predictable, coinciding with changes in season and the recurring changes in food availability. Other migratory journeys, such as those made by sperm whales, can appear random, or driven by unique circumstances, with movements inside enormous 'home ranges'. However, these constitute migrations in the sense that such forays might involve the animal travelling the length and breadth of its normal home range, comprising several thousand miles and sometimes entirely on the High Seas. For many of these species, data about the subtleties and extent of such migrations and impetus for such movements are not yet available. Migration routes may cross regularly between the national jurisdiction of coastal states or between national jurisdictions and the High Seas. These long journeys while not entirely regular or predictable may still constitute migration under the working definition of CMS.

18. At the most local, the range expansions of riverine species in response to seasonal increases in water movements among patchily distributed habitat, while not necessarily on the same scale as marine cetaceans, often cross national borders and are also considered migrations by the CMS.

19. On the High Seas, as vast area that is 64 per cent of the world's oceans and nearly 50 per cent of the planet's surface, many human activities remains unregulated or poorly managed, with ecosystem and key habitat considerations seldom taken into account. The sectoral nature of current management and regulation, where it exists, means that there is no mechanism for creating multi-sector conservation mechanisms or for managing impacts across sectors. A UN-based 'process' which could lead to a new multilateral agreement for high seas biodiversity conservation (perhaps under UNCLOS) is being discussed. Within such a process' the role for MEAs will need to be resolved. CMS and its agreements have an important role to play in high seas species conservation but this role must be negotiated and integrated into a high seas governance mechanism.

I (b) Resolution 8.22: Adverse Human Induced Impacts on Cetaceans

20. During the 8th CMS Conference of the Parties (CMS COP) in 2005, *Resolution 8.22: Adverse Human Induced Impacts on Cetaceans* was passed acknowledging that human induced impacts on cetaceans are increasing and urging Parties and non-Parties which exercise jurisdiction over any part of the range of cetacean species listed on the appendices of CMS to cooperate as appropriate with relevant international organizations and to promote the integration of cetacean conservation into all relevant sectors.

21. *Resolution 8.22* requests the CMS Secretariat and Scientific Council to:

1. review, in collaboration with the scientific advisory bodies of CMS cetacean-related Agreements, the extent to which CMS and CMS cetacean-related Agreements are addressing the following human induced impacts through their threat-abatement activities:
 - i. entanglement and bycatch;
 - ii. climate change;
 - iii. ship strikes;
 - iv. pollution;
 - v. habitat and feeding ground degradation;
 - vi. marine noise;...and to prioritize the impacts and regions requiring most urgent attention, developing recommendations for how these priorities can be addressed by CMS;
2. cooperate and collaborate with the IWC which also has competency for the conservation and management of cetacean populations to further identify priority impacts and regions requiring urgent attention;
3. identify and promote collaboration and synergies between CMS, CMS cetacean-related agreements and relevant MEAs including the IMO, IWC, IWC SC, IWC CC, OSPAR, UNICPOLOS, the Cartagena Convention, European Union Habitats and Species Directive, the Bern Convention and the UNEP Regional Seas Programme, with some consideration also being given to areas where greater collaboration between CBD and CMS might be worthwhile; and

4. propose a work programme to the CMS Conference of the Parties of further strategic action that considers the work of CMS and the reviewed MEAs, and promotes collaboration and synergies between them.

22. In support of *Resolution 8.22* this report seeks to explore the extent to which the decision-making bodies of CMS and CMS cetacean-related agreements, IMO, IWC SC and CC, OSPAR, UNICPOLOS and the UNEP Regional Seas Programme are addressing the human induced impacts threat abatement activities.

23. With the input and cooperation of the scientific advisory bodies of both CMS and the CMS cetacean-related agreements, the report:

1. reviews the extent to which CMS and CMS cetacean-related Agreements are addressing the listed impacts through their threat abatement activities;
2. analyzes the gaps and overlaps between CMS activities and the reviewed MEAs; identifying where collaboration and synergies can exist; and
3. identifies priority impacts and regions requiring urgent attention and develops recommendations for how these priorities can be addressed by CMS.

24. This information will allow the CMS Secretariat to cooperate and collaborate with the IWC work programmes which address human induced impacts to cetaceans, by working with the organization's Scientific and Conservation Committees to further identify priority impacts and regions requiring urgent attention.

25. The sections that follow seek to provide this review and analysis. The author fully acknowledges that the review does not include important work that has taken place over the last two - three decades to mitigate and reduce threats, without which the situation for cetaceans would probably be far worse. The review's purpose is to provide a snapshot of broadly what is known in order to inform the institutional networking that is necessary to improve the future outlook for cetaceans. However, a more detailed review, perhaps by the Aquatic Mammals Working Group, is warranted as part of the long-term process proposed in Section VI, to provide greater certainty and the important metrics that will be needed to measure progress.

II. Overview of threats listed in Resolution 8.22

26. The International Union for the Conservation of Nature (IUCN) recognises 87 species of cetaceans globally. The latest Red List data indicates that 13 species are known to be Vulnerable or Endangered. Several species are listed as Critically Endangered. A number of subspecies and populations also fall into these classifications. One species, the baiji (*Lipotes vexillifer*), is Critically Endangered (Possibly Extinct). The status of many more species, subspecies and populations is not well enough known to enable confident assessments to be made about their survival probability (IUCN, 2010). Most of these (listed as Data Deficient) are small cetaceans that are poorly known, particularly globally. One difficulty in making assessments has been that although one or more populations of a species may be known to be in serious trouble, other populations of that same species may be much less so (Reeves et al., 2008). Some of these populations may turn out to be subspecies or even species as the taxonomic progress in cetaceans has been retarded by a lack of specimens (Reeves et al. 2004).

27. It is well understood that cetaceans face a wide range of threats globally. The level of impacts differs significantly from region to region. The following section provides a summary of these threats globally and then by broad geo-political oceanographic regions.

28. In the following section a global overview is first supplied and then a ranking of indicative importance is proposed for each geo-political region (II (b)-(n), see a map of the broad regions on page 29). This is intended to provide the basis for developing a CMS programme of work. The regional ranking is summarized again at the end of the section (II (o)). This ranking is drawn from the evidence available but it is expected that Parties to CMS will apply a layer of political analysis before reaching conclusions.

29. It should also be noted that for many areas of the world there is simply no research to draw upon for this analysis. This should not be taken to mean that no threats to cetaceans exist in these areas, but rather that in many parts of the world cetacean abundance, distribution and threat impacts simply have not been formally identified, quantified or qualified.

II (a) Global summary of threats to cetaceans

Bycatch, entanglement, depredation and prey depletion

30. Global fisheries appear to be close to their sustainable limits. The biennial State of World Fisheries and Aquaculture (SOFIA) review confirms that in 2007, about 28 per cent of fish stocks were either overexploited, depleted or recovering from depletion and a further 52 per cent of stocks fully exploited (Pulvenis, 2009).

31. The growth of many modern commercial fisheries, and the ongoing use of fishing techniques known to cause entanglement, continue to impact many cetacean populations around the world. Competition with fisheries is a general problem that is yet to be quantified. Even though it is a logical premise that severe over-fishing must be an issue for fish eating predators it remains difficult to prove. However, the bycatch (the unintended capture and kill of non-targeted species in fishing operations) of long-lived, late maturing, low fecundity species such as marine mammals, seabirds, and sea turtles pose one of the greatest known risks to the survival of many populations (Read, 2008). While initial research and political attention was focused on bycatch by large industrial fleets like tuna purse-seines and high seas driftnets, it is increasingly clear that it is equally important to consider the impacts of bycatch in artisanal fisheries and other fisheries working in coastal seas (Northridge, 1991, Reeves et al., 2003, Reeves et al., 2005; D'Agrosa et al., 2000; Mangel et al., 2010) Incidental mortality of cetaceans from entanglement in discarded or derelict synthetic fishing gear (often called 'ghost nets') and through the ingestion of fishing debris is also an issue of growing concern (Northridge, 1991).

32. Although estimates of bycatch and rate of bycatch are difficult to obtain, especially in developing countries where extensive artisanal fisheries account for a high proportion of the bycatch (Félix & Samaniego 1994; Palacios & Gerrodette, 1996) there has been considerable progress in the task of documenting cetacean bycatch in some areas during the last few decades (Jefferson and Curry, 1994; Perrin et al., 1994; Northridge & Hofman, 1999; Young & Iudicello, 2007; Read, 2008). The gear types implicated are gillnets, trawl, set nets, trammel nets, driftnets, beach seines, purse seines, traps and pots, long-lines and rolling hooks. One important estimate indicates at least 300,000 cetaceans are bycaught each year (Read et al., 2006). The entanglement of baleen whales in debris such as synthetic rope can also be lethal, but this type of entanglement is often not part of official estimates of mortality from bycatch (Lambertsen, 2006). Reducing bycatch is believed by some conservation biologists to be the single most important factor in conserving threatened cetacean populations worldwide (Reeves and Reijnders 2002).

33. The high mortality of cetaceans (and other marine species) in large-scale drift gillnet fisheries on the high seas has been largely eliminated, at least in some ocean regions, as a result of the United Nations General Assembly driftnet ban in 1993 (Northridge & Hofman, 1999). Bycatch remains problematic however in the Baltic Sea area (ASCOBANS, 2009), the Mediterranean Sea and some Exclusive Economic Zones (EEZs)

where forms of driftnetting still occur. Driftnets, although ostensibly banned from the Mediterranean by the European Union, the General Fisheries Commission for the Mediterranean (GFCM) and the International Commission for the Conservation of Atlantic Tuna (ICCAT) since 2002 and 2003, continue to be used illegally across the region. There are estimated to be up to 600 illegal driftnet vessels operating in the Mediterranean, including many from EU Member States. Sperm whale and striped dolphin bycatches continue to occur in the illegal driftnet fishery in Southern Italy. Very high level cetacean bycatches have been reported in the Moroccan driftnet fishery in the Alborán Sea and the Turkish driftnet fishery in the Aegean Sea which have not been banned. It is also uncertain whether the ban has been fully implemented outside EEZs in parts of the southern Atlantic and southern Pacific Oceans. In the ASCOBANS area set gillnets are considered the biggest threat from fisheries. (Reeves *et al.*, 2003; Reeves *et al.*, 2005; Akyol *et al.*, 2005; Tudela *et al.*, 2005; Burken, 2008; Pace *et al.*, 2008; Notarbartolo di Sciara & Birkun, 2010; ASCOBANS Jastarnia Group, 2011)

34. It is important to note that freshwater cetaceans are also threatened by bycatch and reduced availability of prey. These animals are perhaps more vulnerable to these threats, in comparison to marine cetaceans, because their habitat requirements often place them in areas where human activities are most intense and they have no other habitat to potentially move to (Smith & Smith, 1998). A particular problem faced by some cetaceans in rivers has been bycatch or incidental killing in fishing with electricity. This practice, which is generally illegal, was cited as being responsible for the largest number of recent known deaths of the Yangtze River dolphin or baiji (Zhang *et al.* 2003) which is now regarded as functionally extinct.

35. Another fisheries interaction of growing concern is depredation (the taking of catch or bait from nets and long-lines) which is expected to be a persistent and increasing problem as humans and cetaceans compete for the same resources (Read, 2008). Depredation may increase due to a combination of factors, including the decline of prey population from overfishing cultural transmission of the behaviour through populations, and continued feeding of wild cetaceans by humans (Myers & Worm, 2003; Coleman *et al.*, 2004; Whitehead *et al.*, 2004), although no further information is available to quantify this.

36. While the deployment of acoustic deterrents (pingers) in certain fisheries has been effective in reducing cetacean bycatch and possibly depredation rates (Bordino *et al.*, 2002; Carlstrom *et al.*, 2002; Cox *et al.*, 2001; Cox *et al.*, 2003) there is uncertainty about the long-term efficacy of acoustic deterrents and the possibility that they cause displacement of cetaceans away from key feeding habitat. These types of 'technical fixes' are also fairly expensive and difficult to monitor making their application to small-scale fisheries in developing nations generally infeasible.

Climate change

37. The Intergovernmental Panel on Climate Change (IPCC) Fourth Assessment Report states that 'warming of the climate system is unequivocal, as is now evident from observations of increases in global average air and ocean temperatures, widespread melting of snow and ice and rising global average sea level' (Pachauri & Reisinger, 2007) Climate change can affect marine ecosystems through ocean warming, by increasing thermal stratification and reducing upwelling, sea level rise, and through increases in wave height and frequency, loss of sea ice, increased risk of diseases in marine biota and decreases in the pH and carbonate ion concentration of the surface oceans, and changing oceans currents (Parry *et al.*, 2007).

38. The effects water temperature variations have been profound, impacting plankton communities as well as larval drift, distribution and abundance of many fish stocks. There have also been significant changes in air temperatures, sea-ice and ocean temperatures around the Antarctic Peninsula and in the Scotia Sea. The decline in the abundance of krill in this area appears to be associated with changes in sea ice in the southern Scotia Sea and around the Antarctic Peninsula (Atkinson *et al.*, 2004). Future reductions in sea ice may therefore lead to further changes in distribution and abundance across the whole area, with consequent impacts on food webs where krill are currently key prey items for many predator species and where krill fishing occurs. For other species the uncertainty in climate predictions leads to uncertainty in projections of impacts, but increases in temperatures and reductions in winter sea ice would undoubtedly affect the reproduction, growth and development of fish and krill, leading to further changes in population sizes and changes in distributions (Parry *et al.*, 2007) The food chains of numerous migratory marine species may be affected (Simmonds *et al.*, *in press*).

39. Another effect of increasing CO₂ levels in the atmosphere is the predicted increase in ocean acidity. Ocean acidification is expected to reduce the ability of invertebrates to incorporate calcium in their exoskeletons. This could affect both the food supply of cetaceans (such as krill) and their habitat (for example coral reefs). The implications of climate changes are compounded by the apparent rate of change which is thought to be much faster than anything that most marine species have been exposed to in the past. When considered in the context of cumulative impacts, the ability of species and populations to adapt to this rapid change may be compromised.

40. Migratory cetaceans are key components of biological systems in high latitude regions, where the speed and magnitude of climate change impacts are generally greatest. Other threatened cetacean populations in temperate and tropical areas with manifestations of climate change, such as greater frequency and severity of

storms, flooding, and drought, may experience increasing resource-use conflicts between humans and wildlife. A particular problem relates to the effects of altered discharge regimes in the Asian and South American rivers, mangroves and estuaries inhabited by cetaceans (Würsig et al., 2001). In estuaries, this problem will be compounded by encroaching salinity and increasing sedimentation caused by sea-level rise. Across the world's oceans, rivers and estuaries, cetaceans rely on highly productive seasonal habitats that may become less food-rich and predictable in space and time.

41. While migratory species are adapted to adjust their behaviour in line with annual changes in the weather, the decoupling of climatic variables between geographically separate critical habitats (e.g. breeding and feeding grounds) may result in mis-timed migration of the animals themselves or their prey with possible deleterious impacts on populations. These considerations might indicate that certain species and populations may be more vulnerable, including those with a limited habitat range or those for which sea ice provides an important part of their habitat or species that move in summer from some distance to areas covered by sea ice in winter (Cooke et al., 2003; Greene & Pershing, 2004; MacGarvin & Simmonds, 1996; Simmonds & Isaac, 2007; Robinson et al., 2009; Simmonds & Elliot, 2009).

42. Physical changes in sea ice and freshwater discharge are well advanced and ongoing in Polar Regions, and these changes are probably already influencing ocean productivity, human activities, and contaminant flux, all of which have implications for cetacean populations (Tynan & DeMaster, 1997).

43. Climate-driven shifts in human behaviours and economic activities as a result of loss of Arctic sea ice may include increases in shipping, oil and gas exploration and fishing which in turn may exacerbate acoustic disturbance, ship strikes, pollution, bycatch and prey depletion for Arctic cetaceans. In the tropics, climate change may result in increased hunting pressure on near-shore dolphins and whales off Asia, Latin America, Africa, and elsewhere as the availability of other marine resources changes or diminishes. Tropical coastal and riverine cetaceans such as the Irrawaddy dolphin (*Orcaella brevirostris*), Indo-Pacific humpback dolphin (*Sousa chinensis*), and finless porpoise (*Neophocaena phocaenoides*) are particularly vulnerable to the localized human behaviour impacts of climate change (Alter et al., 2010).

44. The *Climate Change and Vulnerability of Migratory Species: Species Assessments Preliminary Review* presented to the CMS Scientific Council in 2010 found that all whales specializing solely on plankton and krill are limited in their ability to adapt to climate change by their diets and will be highly vulnerable due to impacts of climate change on food availability. This will emerge as one of the main limiting factors influencing future survival of these species. These species will also be threatened by changes in ocean currents and upwellings and the affects of ocean acidification on food availability. The earliest impacts on plankton and krill feeding whales populations will be exhibited by species dependent on Polar Regions. A significant number of cetacean species that exhibit a strong dependency on Arctic sea ice are highly vulnerable to climate change. These species will be will be threatened by a drastic reduction and loss of suitable habitat. Their dependence on sea ice for food availability also makes them vulnerable to climate change. In addition cetacean species which are strongly dependent on coral reefs may be highly vulnerable to climate change impacts (McNamara, 2010)

Chemical pollution

45. There are many different sources of chemical pollution and a number of routes by which it can enter aquatic environments, including via domestic sewage, industrial discharges, and seepage from waste sites, atmospheric fallout, domestic run-off, accidents and spills at sea, operational discharges from oil rigs, mining discharges and agricultural run-off. Many rivers, estuaries and coastal waters near large human population centres show signs of eutrophication and heavy-metal contamination. Anecdotally, toxic algal blooms and dead zones are increasingly common around some estuaries and bays.

46. The impacts of chemical pollution on marine species and populations range from direct physical poisoning to degradation of important habitats. The chemicals that are probably of most concern for cetaceans are the historic uses of POPs (persistent organic pollutants) including pesticides such as DDT (Dichloro-Diphenyl-Trichloroethane) and its derivatives, and industrial chemicals including PCBs (Polychlorinated biphenyls) and flame retardants. These substances bio-accumulate in foodwebs and can have severe impacts on top marine predators. Damage to the reproductive and immune systems of marine mammals (and other species) are likely consequences of pollution. (O'Shea et al., 1999; Reijnders et al., 1999; Reijnders et al 1999a; Ross et al., 2000; Reijnders et al., 2009; Jepson et al., 2009) although it is often difficult to make direct links between pollutant levels and pathological effects.

47. A relationship between organochlorines and reproductive, endocrine and immunological disorders has been strongly suspected in marine mammals from highly contaminated areas and organochlorines have long been known to affect certain seal populations (Reijnders et al., 2009). More recently evidence has accrued of health effects on small cetaceans (Jepson et al., 2009; Murphy, 2009). Small cetaceans have a low capacity to metabolize PCBs and DDTs in comparison to birds and many terrestrial mammals. Marine mammals from the temperate fringes of the northern hemisphere, particularly fish-eating species which inhabit the mid-latitudes of Europe and North America, show the greatest organochlorine loads; noteworthy are the extremely high levels

found in the Mediterranean Sea and certain locations on the western coasts of the United States. During recent decades, concentrations have tended to decrease in the regions where pollution was initially high although there is now evidence that they have reached a plateau in Europe at least; meanwhile they have generally increased in regions located far from the pollution source as a consequence of atmospheric transport and redistribution. It is expected that the Arctic and, to a lesser extent, the Antarctic, will become major sinks for organochlorines in the future; this process may already be significant for some compounds such as Hexachlorobenzenes and Hexachlorocyclohexanes. (Aguilar et al., 2002)

48. Some freshwater cetaceans may be at greater risk from pollutants because they live in highly contaminated water systems (Smith et al., 2001; Smith et al., 2002). Mercury pollution has been noted as a particular problem in some rivers (e.g., some tributaries to the Amazon and Ayeyarwady) where the element is used to amalgamate gold during mining operations. Cetacean populations living in the Black Sea are regarded as being significantly at risk because of its semi-enclosed nature. Similarly, the slow rate of exchange of water between the Mediterranean basin and the neighbouring Atlantic Ocean likely exacerbates pollution effects in the Mediterranean (Storelli et al., 2007)

49. Oil pollution is in a special class. Cetaceans can ingest oil and oil-derived compounds either directly from the water or with their food. Poisonous vapours can also be inhaled especially as the more volatile components evaporate into the air from freshly spilled oil. Oil pollution also has the potential of causing mechanical damage through the fouling of baleen, impairing a whale's ability to feed. It is not possible to assume that cetaceans will simply avoid contaminated areas. Studies have found that dolphins apparently do not seem to detect sheen oil and that although they might detect slick oil, they do not avoid travelling through it (Smultea & Wursig, 1995). Gray whales (*Eschrichtius robustus*) have been documented swimming through oil seeps off California (Evans, 1982). The chronic effects of oil entering food-webs must also be considered (Peterson et al., 2003).

50. There has been a worldwide increase in reports of viral and bacterial diseases affecting marine species as well as an apparent increase in toxic algal blooms. The increasing and cumulative pressures on cetaceans, including climate change may also make cetaceans more susceptible to disease. The transport of pathogens around the world, through the movement of products and ballast water, may increase exposure to disease and environmental contaminants may be facilitating the emergence of new diseases (Simmonds & Mayer, 1997; Hall et al., 2006; Reijnders et al., 2009)

Ship strikes

51. Collisions between vessels and cetaceans may be happening more frequently than previously suspected and can, especially in the case of endangered or geographically isolated cetacean populations, pose a serious conservation threat. Reviews of ship strikes incidents have shown cases can be unreported. This is partly due to the lack of regulation or enforcement that includes obligations to report collisions. In some cases, crews only become aware of the event after arrival at port, suggesting that whales which are hit and killed or wounded but that do not become wedged on the bow, may go entirely unnoticed. (Best et al., 2001; Dalebout et al., 2004; Clapham, 2005; Félix & Van Waerebeek, 2005; Van Waerebeek et al., 2006)

Marine noise

52. Hearing is one of cetaceans' most important senses. They use sound to accomplish critical aspects of their lives, including finding food, navigating, interacting socially including finding mates and identifying predators. Masking this ability by introducing anthropogenic sound – whether causing physical damage or disturbance – may seriously compromise the viability of individuals and populations. Marine mammals have demonstrated various responses to specific noise exposures ranging from changes in their vocalizations (shifts in frequency, becoming silent, etc.) and displacement or avoidance (including shifting their migration paths) through alterations in their diving, swim speed, respiration or foraging behaviour, to hearing damage and strandings (Wright et al., 2007).

53. Human-introduced noise has been documented to induce short-term behavioural reactions including cessation of feeding, socializing or vocalizing, changes in diving behaviour as well as avoidance or attraction. In addition, noise has been documented as causing displacement of cetaceans from preferred habitats. If these impacts were of only short duration they would not necessarily be significant. However, if these disturbances are repeated or are of long duration, they may cause stress, debilitation and ultimately mortality. Underwater noise has been shown to elicit disturbance responses in cetaceans at distances of hundreds of kilometres, cause temporary or permanent hearing loss, and can result in physical injury and death (Bowles, 1994; Richardson et al., 1995; Whitehead & Weilgart, 1995; Frantzis, 1998; Katona & Kraus, 1999; Rowles et al., 2000; Balcomb & Claridge, 2001; Jepson, 2003; Reeves et al., 2003; Simmonds et al., 2003; Wright et al., 2007; Würsig & Richardson, 2009). In particular members of the beaked whale family have reacted to the use of low and mid-frequency active sonar (1–10 kHz), as used particularly in military exercises, with a series of mass strandings (Evans & England, 2001; Evans & Miller, 2004; Cox et al., 2006; Dolman et al., *in press*). These species may

be particularly vulnerable to population-level impacts from military sonar due to their generally clumped distribution in particularly deep waters and the localized and apparently lethal impacts of transmitted sounds.

54. Introduced noise pollution comes from ships and other vessels, sonar used in military activities, fisheries anti-predation devices, marine renewable energy devices (including from wind, wave and tidal), and the air-guns used in seismic exploration to find oil and gas deposits and for ocean research (Reeves et al., 2003; Wright et al., 2007).

55. The growth of offshore wind farms has recently raised concerns about their impact on the marine environment (Dolman & Simmonds, 2010). Construction typically generates considerable impulsive sound energy from pile-driving that lasts for considerable periods of time. Both studies and modelling show that pile-driving and other activities that generate intense impulses during construction are likely to disrupt the behaviour of marine mammals at ranges of many kilometres, and that these activities have the potential to induce hearing impairment at close range (Madsen et al., 2006). Pile driving is also used in coastal developments, such as harbours and marinas, which may be of concern for local populations.

56. While documented disturbance reactions of individual animals are becoming more common in the literature, we still lack a comprehensive understanding of whether or how anthropogenic noise may affect populations of marine mammals (Nowacek, 2007). Documenting the effects of ocean noise has been difficult because of the inherent problem in tracking population trends in cetaceans (Taylor et al. 2007). However, the use of acoustic detection devices that can record presence or absence of some cetaceans over a period of months could enable precise monitoring and is already being employed in some areas (notably in the Baltic) to detect the effects of constructing and operating wind farms.

Habitat degradation

57. It is important to both the individual and the survival of the population (or species) that their habitat continues to be supportive. Each of the threats reviewed in this report cause or may cause habitat degradation that affect cetaceans (Simmonds & Hutchinson, 1996; Harwood, 2001; Reeves, 2003; Hoyt, 2005; Evans, 2009; Reeves, 2009).

58. Changes in the atmosphere, weather patterns and marine ecosystems or the modification of habitats may cause shifts in cetacean food sources, upwelling patterns and prey aggregation. Also, the significant extraction of biomass through large scale commercial fisheries and in some cases small scale coastal and freshwater fisheries, have been shown to have system level effects, depleting fish, crustacean and mollusc populations and degrading the habitat of predator species. The impacts may have serious and long-term consequences for cetaceans (Reeves et al., 2003; Ainley et al., 2006; Ainley et al., 2007; Acevedo-Gutierrez, 2009; Evans, 2009).

59. Habitat loss is especially critical for cetaceans with limited range, such as coastal or river dolphins. In many riverine areas habitat loss is caused by dams, fishing structures and withdrawal of water for human use (Hoyt, 2005). In some parts of the world water management, flood control and major river modification, has led to population decline. Dams prevent migration and create barriers which fragment populations. Prey species may be reduced, while sedimentation processes can change (causing increased deposition in some areas and increased erosion in others but both often resulting in habitat loss), and eutrophication (from nutrient over-enrichment) and salinity increase. Water development projects in Asia, and to a lesser degree South America, have fragmented cetacean populations and, in some areas, eliminated their habitat. (Reeves & Smith, 1999; Harwood, 2001; Reeves, 2003; Sini et al., 2005) The degradation of coastal habitats due to the expansion of tourism activities is known to have important effects on some cetacean populations. This is especially true for obligate coastal species that reside where such human activity is concentrated (Lusseau, 2004; Williams et al., 2002; Williams et al., 2002a; Scheidat et al., 2004; Williams et al., 2006).

Other impediments to migration, including hunting, marine bushmeat and live capture

60. Some coastal communities have exploited cetaceans for centuries, mainly for food and oil. However, the pattern of exploitation has dramatically changed over the last few centuries as different cetacean species have become the focus of commercial hunts. The dramatic decline in 'great whale' populations worldwide is primarily due to commercial whaling, which is regulated by the International Whaling Commission (IWC), implementing the 1946 International Convention on the Regulation of Whaling. In 1982, the IWC agreed to a total moratorium on commercial whaling by setting zero quotas. However, three whaling nations still conduct annual hunts of over 1,400 whales in the North Atlantic, North Pacific and Southern Ocean, as well a large number of small cetacean species.

61. The IWC permits 'aborigines', whose cultural and nutritional need for whales and whaling has recognized, to hunt some baleen species 'exclusively for local consumption'. It establishes five year blocks of annual Aboriginal Subsistence Whaling quotas. However the IWC's Scientific Committee has expressed concerns that it has inadequate information on some species to set safe quotas. Commercial and Aboriginal Subsistence whaling remains the competency of the IWC and is not addressed further in this report.

62. Drive hunting, also called dolphin drive fishing, takes place in several places around the world. The largest number of dolphins hunted using this method is in Japan; however the practice also occurs in the Solomon and Faroe Islands. Dolphins are mostly hunted for their meat although some are captured live for dolphinariums. Despite the highly controversial nature of these hunts which have resulted in intense international criticism, and the possible health risk that the often polluted meat causes, many thousands of dolphins are caught in drive hunts each year. IWC does not currently regulate these forms of hunting.

63. With increasing demand for protein in the developing nations, bycatch of smaller cetaceans in some regions has evolved into untargeted catch, and in some cases has transitioned into directed catch as fishermen discover the value of cetaceans as food or bait. This use of 'marine bushmeat' has occurred in several regions in the western and south eastern Pacific, eastern Atlantic and Indian Oceans and threatens to greatly increase present pressure on cetacean populations (Clapham & Van Waerebeek, 2007). Such transitions are facilitated by poverty and the sometimes rapid dispersal and migration of human communities, which can lead to abrupt changes in local fishing traditions and cultural attitudes where otherwise cetaceans have traditionally been revered and their consumption has been considered taboo. The dire state of many of the world's artisanal fisheries suggests that marine mammals are likely to become more frequent targets of marine bushmeat harvest in the future (DeMaster et al., 2001, Read, 2008).

64. In various areas around the world cetaceans are 'live captured' specifically for the dolphinarium industry, sometimes as a part of drive hunt operations. Captive cetaceans have also been used for research, for so-called 'Dolphin Assisted Therapy' and employed in military operations. The removal of live cetaceans from the wild, for research or captivity, is equivalent to incidental or deliberate killing as the animals removed are no longer available to sustain natural populations (Reeves et al., 2003). In some jurisdictions cetacean display facilities have been phased out or prohibited, and in the United States and Hong Kong a high proportion of the whales and dolphins now in captivity have been captive-bred. A large, growing and increasingly opportunistic trade in dolphins and smaller toothed whales nevertheless exists, its centres of supply having shifted to the Russian Federation and developing nations in Latin America, the Caribbean, West Africa, and Southeast Asia. Rigorous assessment of source populations is often lacking, and in some instances live capture is adding to the pressure on populations already at risk from hunting, bycatch, habitat degradation, and other factors. (Fisher & Reeves, 2005)

II (b) North East Atlantic Ocean

From the Norwegian Sea to Southern Spain, and including the Baltic Sea, Gulf of Bothnia, and the associated High Seas Atlantic

65. The North East Atlantic is an extremely diverse marine environment, extending from Southern Spain to Iceland, Scandinavia and the frontier of the Arctic Circle. The extent of threats to cetaceans in the region is dramatically illustrated by the decline in the population of harbour porpoises (*Phocoena phocoena*) in the Baltic Sea and coastal bottlenose dolphin populations in areas of Europe. The harbour porpoise is the most common cetacean species in the North Sea and the only native cetacean inhabiting the Baltic. According to the most recent estimates, the number of harbour porpoises in the Baltic Sea has dropped to around 600.

66. **Bycatch** is the most serious threats to cetacean populations in this region (Northridge, 1991; Kaschner, 2003; Ross & Isaac, 2004; Rogan & Mackey, 2007; Leeney, 2008; Fernández-Contreras, 2010). A large number of fisheries, varying in size and associated risk of **entanglement** for cetaceans, operate throughout region. Bottom-set gillnet fisheries probably cause the majority of all fisheries-related cetacean mortalities in the North and Baltic Seas and adjacent waters. Harbour porpoises (*Phocoena phocoena*) appear to be the main casualties of entanglements, but other delphinid species, such as white-beaked dolphins (*Lagenorhynchus albirostris*), striped dolphins (*Stenella coeruleoalba*), Atlantic white-sided dolphins (*Lagenorhynchus acutus*) and common bottlenose dolphins (*Tursiops truncatus*) as well as long-finned pilot whales (*Globicephala melas*) are also at risk of entanglement. The French tuna driftnet (banned since 2008) fishery in the north-eastern Atlantic, pelagic trawl fisheries, and coastal gillnet fisheries in western Europe are all implicated in cetacean bycatch (Goujon et al., 1993; Couperus, 1997; Tregenza et al., 1997; Vinther, 1999; Tregenza & Collet, 1998). The population of harbour porpoises in the Baltic Sea is critically endangered and recovery will not be helped by ongoing bycatch in fisheries, and possibly other factors such as pollution and habitat degradation (Skóra et al., 1988; Berggren, 1994; Berggren & Arrhenius, 1995; Donovan & Bjørge, 1995; Kinze, 1995; Kock & Benke, 1996; Berggren et al., 2002; MacKenzie et al., 2002; Huggenberger et al., 2002). Common minke whales (*Balaenoptera acutorostrata*) are known to become entangled in ropes and creel lines occur throughout Scottish waters (Northridge et al., 2010).

67. A decrease in harbour porpoise (*Phocoena phocoena*) abundance was reported during wind farm construction in the Baltic Sea (Carstensen et al., 2006) implicating **noise pollution** as the cause. Environmental Impact Assessments also observed negative impacts to cetaceans during the first two years of wind farm operations off the coastline of Denmark (Teilmann et al., 2007)

68. Observations of changes in strandings and sightings in the north east Atlantic have been suggested to be consistent with changes in regional cetacean communities being driven by **climate change**. If such temperature changes continue, some formerly abundant cold-water species, such as white-beaked dolphins (*Lagenorhynchus albirostris*), may be lost from this region. In a wider context, such changes may lead to populations of cetaceans moving out of areas specifically designated for their protection as they respond to changes in local oceanic conditions (MacLeod et al., 2005).

69. This report will not comment on Norwegian or Icelandic whaling, as these activities fall under the full competency of the IWC. However, the annual Faeroes hunt (grindadráp) kills hundreds of long-finned pilot whales (*Globicephala melas*), common bottlenose dolphins (*Tursiops truncatus*), Atlantic white-sided dolphins (*Lagenorhynchus acutus*) and northern bottlenose whales (*Hyperoodon ampullatus*) each year. Between 2004 and 2009 over 3,000 pilot whales and over 1,400 Atlantic white-sided dolphins were killed in this hunt which is not formally regulated by any international authority.

II (c) Mediterranean and Black Seas

The enclosed area of Mediterranean and Black Seas

70. The Mediterranean and Black Seas are among the most degraded marine ecosystems on Earth, and many cetacean populations in these highly impacted regions are known to be in dramatic decline. The ecosystems within the region are primarily changed or disturbed by pollution, coastal development, extensive vessel traffic, over-fishing and the impacts of introduced species (Notarbartolo di Sciara, 2001). These semi-enclosed seas are also regarded as particularly susceptible to climate change (Gambaiani et al., 2008).

71. Cetacean **bycatch** across the region is of significant concern, involving at least fin whale (*Balaenoptera physalus*), common minke whale (*Balaenoptera acutorostrata*), sperm whale (*Physeter macrocephalus*), long-finned pilot whale (*Globicephala melas*), Cuvier's beaked whale (*Ziphius cavirostris*), false killer whale (*Pseudorca crassidens*), Risso's dolphin (*Grampus griseus*), common bottlenose dolphin (*Tursiops truncatus*), short-beaked common dolphin (*Delphinus delphis*), striped dolphin (*Stenella coeruleoalba*), and rough-toothed dolphin (*Steno bredanensis*) (Notarbartolo di Sciara & Birkun, 2010).

72. Bycatch constitutes the most significant threat and the major source of human induced mortality of the isolated Black Sea cetaceans. The bycatch of the Black Sea harbour porpoise (*Phocoena phocoena*) is extremely serious, and it is possible that annual mortalities number in the thousands (Birkun, 2005; Birkun, 2008; Mikhailov, 2008; Ozturk & Tonay, 2008; Radu et al., 2008; Sorokin & Birkun, 2008; Birkun & Frantizis, 2008; Notarbartolo di Sciara & Birkun, 2010).

73. Fishing gear types involved in these bycatches include surrounding nets, gillnets, traps, hooks and lines (ACCOBAMS, 2008). Intensive tuna mariculture has led to entanglement in exclusion nets (Reeves et al., 2003). Harbour porpoises are the most frequently recorded cetaceans bycaught in the Black Sea, whereas common dolphins (*Delphinus delphis*) and striped dolphins (*Stenella coeruleoalba*), as well as some common bottlenose dolphins (*Tursiops truncatus*) are the most frequently bycaught species in the Mediterranean Sea. (Pavlov et al., 1996; ACCOBAMS, 2008). There are indications that animals are being shot or are victims of explosives, presumably during fishery interactions (ACCOBAMS, 2008; Notarbartolo di Sciara & Birkun, 2010).

74. Sperm whales (*Physeter macrocephalus*) and other cetaceans have been killed incidentally in the Italian and Spanish High Seas driftnet fisheries for swordfish, possibly reducing their abundance in the Mediterranean Sea (Notarbartolo di Sciara, 1990; Silvani et al., 1999). Illegal, large-scale driftnets are still used in several Mediterranean areas, with the bulk of this fleet in Morocco's harbours. Between December 2002 and September 2003 a combined total of 237 short-beaked common dolphins (*Delphinus delphis*) and striped dolphins (*Stenella coeruleoalba*) were bycaught along with significant numbers of sharks. Estimates for a 12-month period by the whole driftnet fleet yielded 3,110–4,184 dolphins (both species) and 20,262–25,610 pelagic sharks in the Alborán Sea alone; further 11,589–15,127 dolphins and 62,393–92,601 sharks are likely killed annually around the Straits of Gibraltar (Tudela et al., 2005).

75. The primary species involved in **depredation** (where cetaceans remove caught fish from long-lines or nets before the catch is brought in) is the common bottlenose dolphin (*Tursiops truncatus*) especially, in gillnets, trammel nets, purse-seines and trawls fisheries, although interactions of short-beaked common dolphins with purse-seine fisheries and killer whale (*Orcinus orca*) interactions with tuna longline fisheries have also been reported. (ACCOBAMS, 2008; Notarbartolo di Sciara & Birkun, 2010)

76. Short-beaked common dolphins (*Delphinus delphis*) have progressively disappeared from most of their previous known range in the region and are now rare in the region. The systematic **culling** campaigns and other takes that occurred between the second half of the 19th century and the 1960s and **habitat degradation** in subsequent years are the most likely causes of their decline in the northern Adriatic Sea (Bearzi et al., 2004). The most critical of the identified threats to the Black Sea bottlenose dolphin (*Tursiops truncatus ponticus*)

remains the degraded state of the Black Sea ecosystem (Simmonds, 2003; Notarbartolo di Sciara & Birkun, 2010). The same is likely to be true for the other marine species found there.

77. Concerns have been raised about the susceptibility of cetaceans to **epizootic diseases** and biotoxins, following the mass die-off of striped dolphins (*Stenella coeruleoalba*) in the Mediterranean and the Black Seas (Simmonds & Mayer, 1987; Reeves et al., 2003; Storelli & Marcotrigiano, 2003; Borrell et al., 2005; Notarbartolo di Sciara & Birkun, 2010).

78. Fin whales (*Balaenoptera physalus*) and sperm whales (*Physeter macrocephalus*) are both impacted by **ship strikes**. Long-finned pilot whales (*Globicephala melas*), pygmy sperm whales (*Kogia breviceps*) and Cuvier's beaked whales (*Ziphius cavirostris*) have also been struck (Reeves et al., 2003; De Stephanis & Urquiola, 2006). Ship-strikes have also been documented as a significant mortality factor for fin (*Balaenoptera physalus*) and sperm (*Physeter macrocephalus*) whales in the Mediterranean Sea (Panigada et al., 2006; Di Guardo et al., 2006; Cagnolaro & Notarbartolo di Sciara, 1992).

II (d) Central and South East Atlantic Ocean (Western Africa)

From Morocco to the Cape of Good Hope, and the associated High Seas Atlantic

79. Little is known about the distribution of most small cetaceans along the west coast of Africa; roughly 25-30 cetacean species are thought to occur there (Perrin & Van Waerebeek, 2007). There is a transition between the southern cool- and warm-temperate to tropical cetacean communities that likely varies with the spatio-temporal movements of the Benguela Current but appears to occur at around 14–16°S latitude where the northern extent of the cold-water upwelling occurs (Hardman-Mountford et al., 2003; Weir, 2010). Many of the mainly tropical species have been recorded from the Azores, reflecting the influence of the north eastern extension of the Gulf Stream. While all the species known from tropical West Africa have been recorded from Senegal and many from the Ivory Coast, the small-cetacean fauna of most of the tropical waters of West Africa remains very poorly known. Almost no information is available for Sao Tome and Principe, Togo or Nigeria. (Perrin & Van Waerebeek, 2007; Van Waerebeek et al., 2003).

80. Cetaceans in the central and south eastern Atlantic face a significant **bycatch** threat from artisanal and commercial fisheries including gillnets, beach seines, trawls, driftnets and tuna purse seines (Maigret 1994, Van Waerebeek et al., 2000; Ofori-Danson et al., 2003; Van Waerebeek et al., 2003; Zeeberg et al., 2006). Many West African countries have large coastal communities and limited food (especially protein) supplies. The likelihood of cetaceans being caught as '**marine bushmeat**' for human consumption is therefore high (Brashares 2004; Clapham & Van Waerebeek, 2007). In some areas cetacean meat is probably still used as bait in shark longline fisheries (Van Waerebeek et al., 2003). Specifically, Atlantic humpback dolphins (*Sousa teuszii*), Atlantic spotted dolphins (*Stenella frontalis*) and Heaviside's dolphins (*Cephalorhynchus heavisidii*) are bycaught in trawl, purse seine, beach seine, set and driftnets, and a small number are probably taken by hand harpoon along the coastline of West Africa. It has been suggested that dolphin deaths in the tropical Atlantic purse seine tuna fishery could be very high, up to 30,000 or more animals per year (Alverson, 1991; Van Waerebeek et al., 2000; Van Waerebeek et al., 2003; Reeves et al., 2005). It is possible that localized extinction of Atlantic humpback dolphins (*Sousa teuszii*) may have occurred in Ghana and neighbouring nations as a result of bycatch and disturbance (Van Waerebeek et al., 2009).

81. **Habitat loss** and **chemical pollution** will become increasingly widespread problems as West African coastal communities increase in size. The region also represents one of the world's principal oil and gas exploration areas, and therefore the potential impacts from oil-related chemical and **noise pollution** should also be considered (Rosenbaum & Collins, 2006).

82. Sperm whales (*Physeter macrocephalus*) are known to be impacted by **ship strikes** around the Canary Islands (André et al., 1994; Reeves et al., 2003).

83. **Live captures** of common bottlenose dolphins (*Tursiops truncatus*) for dolphinariums are also a growing threat (Van Waerebeek et al., 2008). In management terms, live-capture operations are equivalent to hunting, and multi-year, large-scale removals of dolphin species from this region have the potential to effectively extirpate wild populations.

II (e) North West Atlantic Ocean (Atlantic North America and the Caribbean)

From the Hudson Strait to the Gulf of Mexico, the Caribbean and the associated High Seas Atlantic

84. Cetacean populations have been adversely affected by **bycatch** in a number of coastal gillnet and trap-pot fisheries and trawl fisheries in the United States and Canada (Bisack, 1997; Trippel et al., 1996; Fertl & Leatherwood, 1997). Seventy-five per cent of appropriately photographed North Atlantic right whales (*Eubalaena glacialis*) show evidence of **entanglement**, predominantly with lobster fishing gear, and this

percentage increased from 52 per cent in the 1980s (Myers et al., 2006). In 2002, eight right whales were reported entangled, the highest number ever recorded for a single year. Two entanglements are known to have been fatal, four whales are known to have shed gear of their own accord, (Clapham, 2005; Amutis-Silvia, *pers comm*, 2010).

85. At least ten species of cetaceans – short-beaked common dolphin (*Delphinus delphis*), spinner dolphin (*Stenella longirostris*), Atlantic spotted dolphin (*Stenella frontalis*), pantropical spotted dolphin (*Stenella attenuata*), striped dolphin (*Stenella coeruleoalba*), common bottlenose dolphin (*Tursiops truncatus*), short-finned pilot whale (*Globicephala macrorhynchus*), melon-headed whale (*Peponocephala electra*), pygmy killer whale (*Feresa attenuata*) and false killer whale (*Pseudorca crassidens*) – are either **bycaught** or deliberately killed in the Caribbean. Cetacean bycatch in coastal gillnets is considered one of the most serious threats to cetacean populations in this region (Reeves et al., 2003).

86. Along the coastline of Florida and into the panhandle area of the Gulf of Mexico (Alabama and Florida), researchers have documented increasing mortality of common bottlenose dolphins (*Tursiops truncatus*) resulting from the interaction with and **depredation** of recreational fishing gear. The increase in depredation is of concern for small populations of cetaceans because interactions with fishing gear can lead to serious injury or death through entanglement or ingestion. (Wells et al., 1998; Wells & Scott, 1994; NOAA, 2006; Powell & Wells, 2010)

87. Concerns have been raised about the susceptibility of cetaceans to **epizootic diseases** and **chemical pollution**, following the mass die-off of common bottlenose dolphins (*Tursiops truncatus*) in the North Atlantic and Gulf of Mexico, humpback whales (*Megaptera novaeangliae*) in a small area of the western North Atlantic and right whales (*Eubalaena glacialis*) that have been shown to have exposure to potentially toxic, dioxin-like compounds (Reeves et al., 2003). St. Lawrence Estuary belugas (*Delphinapterus leucas*) and their environment are contaminated by polycyclic aromatic hydrocarbons produced by local aluminium smelters. There is a hypothesis that polycyclic aromatic hydrocarbons may be involved in the origin of cancer in these animals (Martineau, 2002).

88. Comprehensive impacts from the Deepwater Horizon oil spill are still unknown but significant numbers of marine mammals were collected, with most found dead. Of the 94 common bottlenose dolphins (*Tursiops truncatus*) recorded by the United States' National Oceanic and Atmospheric Administration, 89 were dead. Similarly one melon-headed whale (*Peponocephala electra*), three spinner dolphins (*Stenella longirostris*), one sperm whale (*Physeter macrocephalus*) and a further three cetaceans of unknown species have been recorded as dead as a result of the Deepwater Horizon oil spill (NOAA Fisheries, 23rd October 2010). Long-term population-level impacts on marine mammals from oil spills have been reported (Matkin et al., 2008), and additional concerns from exposure to oil dispersants have been expressed.

89. The development of oil and gas deposits in many areas, including the Scotian Shelf off eastern Canada (Hooker et al., 1999) has also raised questions about the impact of noise on cetaceans. Endangered North Atlantic right whales (*Eubalaena glacialis*) were found to increase the amplitude of calls during periods of increased environmental noise (Parks et al., 2010). Noise pollution is recognized as a potential danger to the St. Lawrence beluga (*Delphinapterus leucas*) in particular. Findings from a study to determine the impacts of noise on the beluga's communication suggest that typical noise levels in the St. Lawrence River Estuary have a detectable effect on their communication (Scheifele et al., 2005).

90. **Ship strikes** are known to be endangering the small populations of North Atlantic right whales (*Eubalaena glacialis*) along the northeast coastline of the United States (Kraus, 1990). In a recent study, thirty of the fifty-four right whales reported dead between 1970 and 2002 were examined. In 10 of these, the cause of the trauma was presumed to be vessel collision. Sharp ship trauma included propeller lacerations inducing multiple, deep lacerations that often incised vital organs including the brain, spinal cord, major airways, vessels and musculature. Blunt ship trauma resulted in major internal bruising and fractures, often without any obvious external damage (Moore et al., 2004). Analysis indicates that separating ships and whales in the Great South Channel (Southern Gulf of Maine) would reduce the relative risk of ship strike by 63 per cent (Merrick & Cole, 2007).

91. Hydroelectric power projects on three of the main tributaries of the St. Lawrence estuary have been responsible for a 50 per cent **habitat loss** key to the beluga (*Delphinapterus leucas*) population, with industrial development and extension of the port reducing available habitat still further. Many salmon aquaculture sites in the Bay of Fundy employ acoustic harassment devices to deter seals from approaching fish pens. These devices may also exclude harbour porpoises (*Phocoena phocoena*) from important habitat, with evidence that porpoise density was reduced in the vicinity of active acoustic harassment devices (Johnston, 2002).

92. In the Caribbean region, the **live capture** of common bottlenose dolphins (*Tursiops truncatus*) for public display facilities has been identified as a potential threat to local populations, especially in Cuban waters where the majority of live captures supplying facilities throughout the region now occurs (Van Waerebeek, 2006). Evidence is lacking on abundance estimates and population structure for the populations targeted by capture operators. International experts have recommended that international trade in these animals ceases until

a Convention on International Trade in Endangered Species of Wild Flora and Fauna (CITES) ‘no detriment finding’ can be authenticated (Reeves et al., 2003).

93. The belief that cetaceans compete with humans for fisheries resources has prompted the **culling** of belugas (*Delphinapterus leucas*) in Canada’s St Lawrence River (Reeves et al., 2003).

II (f) South West Atlantic Ocean (Atlantic Latin America)

From Venezuela to Cape Horn, and the associated High Seas Atlantic

94. Cetacean bycatch in coastal gillnets is considered one of the most serious threats to cetacean populations in this region (Reeves et al., 2003).

95. **Bycatch** or **entanglement** in fishing nets along the Amazon River and associated estuaries is considered high enough to be of concern for the tucuxi (*Sotalia fluviatilis*) and Guiana dolphins (*Sotalia guianensis*) which are bycaught in gill-, seine-, and bottom-set-nets, and shrimp traps throughout their coastal and riverine ranges. Similarly, Commerson’s dolphins (*Cephalorhynchus commersonii*) and Peale’s dolphins (*Lagenorhynchus australis*) are bycaught or entangled in gillnets, trammel nets and mid-water trawls. Large numbers of Franciscana (*Pontoporia blainvillei*) are bycaught in shark gillnets and researchers say they may be threatened in parts of Uruguay, Brazil and Argentina (Goodall & Cameron, 1980; Goodall et al., 1988; Goodall et al., 1988b; Crespo et al., 1994; Goodall et al., 1994; Iñiguez et al., 2003; Reeves et al., 2005; Flores & Da Silva, 2009; Goodall, 2009). By extrapolation, it has been estimated that at least 650 Franciscana are bycaught and killed by the artisanal fleet of Buenos Aires alone. The current annual mortality is likely to be higher because trawler fleets were not considered. Until recently, bycatch was considered a minor source of mortality for common bottlenose dolphins (*Tursiops truncatus*) in Rio Grande do Sul, southern Brazil. However, stranding data suggests a recent marked increase in mortality, and suggests that the observed increase is due to entanglement in fishing nets. Preliminary analysis indicates that the number of dolphins killed in nets is higher than can be sustained by the population (Crespo, 1992; Crespo et al., 1994; Pinedo, 1994; Siciliano, 1994; Secchi et al., 1997; Di Benedetto et al., 1998; Pinedo & Polacheck, 1999; Monteiro-Neto et al., 2000; Bordino & Albareda, 2004; Fruet et al., 2005; Reeves et al., 2005).

96. Tucuxis (*Sotalia fluviatilis*), Guiana dolphins (*Sotalia guianensis*), Commerson’s dolphins (*Cephalorhynchus commersonii*), Peale’s dolphins (*Lagenorhynchus australis*), Franciscana (*Pontoporia blainvillei*), and other coastal dolphins are deliberately hunted as **marine bushmeat**, for use as bait or for their body parts to be sold as amulets (Crespo, 2009; Dawson, 2009; Flores & Da Silva, 2009; Goodall, 2009).

97. Southern right whales (*Eubalaena australis*) are known to be affected by **ship strikes** as well as harassment and entanglement off the Brazilian and Argentine coastlines (Reeves et al., 2003; Van Waerebeek et al., 2007). These impacts may have a bearing on the conservation of the species in these waters (Lodi & Rodrigues, 2007; Rowntree et al., 2001).

98. The tucuxi (*Sotalia fluviatilis*) is affected by **chemical pollution** from mining operations and is also subject to **habitat loss** and disturbance from dams and hydroelectric power facilities across its range. Bioaccumulation of contaminants is of increasing concern for these animals. (Flores & Da Silva, 2009).

II (g) North East Pacific Ocean (Pacific North America)

From the Bering Seas to 30 degrees N, and the associated High Seas Pacific

99. There is a significant **bycatch** of Dall’s porpoises (*Phocoenoides dalli*) in the North Pacific driftnet fishery which operates in this region (Ohsumi, 1975; Jefferson & Curry, 1994; Jefferson, 2009). The eastern North Pacific population of North Pacific right whales (*Eubalaena japonica*) has been reduced to critically low numbers (~30) by historical whaling. The persistence of this population is clearly endangered by risks such as **entanglement** in fishing pot gear and by ship strikes.

100. Offshore oil and gas development in high-latitude areas of the Northern Hemisphere has generated numerous studies on the effects of **noise pollution** and other sources of disturbance, prompted by concern about bowhead whale (*Balaena mysticetus*) populations (Richardson & Malme, 1993). In British Columbia where salmon culturing is intensive and widespread, there is evidence that cetaceans are excluded from the inner reaches of bays where loud “seal scarers” are used to discourage pinnipeds from approaching salmon pens (Morton, 2000; Morton & Symonds, 2002; Olesiuk et al., 2002). Observations of avoidance responses by killer whales (*Orcinus orca*) to boats showed an apparent shift in avoidance behaviour at high traffic levels (Williams & Ashe, 2007). **Habitat degradation** is apparent in the traditional benthic feeding sites for the gray whale (*Eschrichtius robustus*) in the Bering Sea. In recent years, the whales arrived later in Baja than normal and departed earlier. One hypothesis is that this is due to their need to search for food resources along their migratory route (Newell & Cowles, 2006). Another is that migration timing is affected by ice coverage.

101. Results of a study on **chemical pollution** in the southern resident killer whale (*Orcinus orca*) pods of the eastern North Pacific suggest that these populations are highly contaminated with PCBs and at risk for adverse health effects (Krahn et al., 2007). Concerns have been raised about the susceptibility of cetaceans to **epizootic diseases** and biotoxins, following the mass die-off of various species in the Gulf of California as well as other species elsewhere in the world (Reeves et al., 2003). A long-term study of the resident and transient killer whales impacted by the 1989 'Exxon Valdez' oil spill has revealed that free-ranging killer whales do not or cannot detect or avoid crude oil sheens at the water's surface and are thus susceptible to inhalation of vapours and/or oil, skin contact and ingestion. Recent research is suggesting that affected populations are taking decades to recover from the impacts of such an exposure. Such recovery is slowed further if reproductive females and/or juvenile females are lost. In a small, isolated and threatened population such as one of the killer whale groups exposed to the Exxon spill, a major environmental perturbation can greatly hasten the decline toward population extinction. (Matkin et al., 2008)

II (h) Central East Pacific Ocean (Eastern Tropical Pacific)

From 30 degrees N to Panama, and the associated High Seas Pacific

102. The Central East Pacific is a temperate to tropical region. Dolphins in the Eastern Tropical Pacific have historically suffered very high mortality from **bycatch** in a tuna purse-seine fishery, particularly in its early years (Wade, 1995). These mortalities cannot strictly be considered bycatch because the fishermen intentionally chase and encircle the dolphins with their nets to catch the yellow tuna (*Thunnus albacares*) that are often found in association with the animals. This led to substantial reductions in the abundance of pantropical spotted dolphins (*Stenella attenuata*) and spinner dolphins (*Stenella longirostris*) and became known as the 'tuna-dolphin issue' (Smith, 1983, Wade, 1993; Gerrodette, 2009). Management actions taken by the United States and international fishing agencies over three decades have successfully reduced dolphin bycatch to around 1,000 animals a year. Since the early 1990's, dolphin populations should have started to recover, but as of 2002 they were not recovering at expected rates. A number of hypotheses for this slow recovery are being explored, including ecosystem changes, under-reporting or mortality, stress, abortions and separation of mothers and calves resulting from the continued chasing and encircling of dolphins by the tuna fishery (Archer et al., 2001; Cramer et al., 2008; Gerrodette, 2009).

103. **Bycatch** of short-beaked common dolphins (*Delphinus delphis*), long-beaked common dolphins (*Delphinus capensis*), northern right whale dolphins (*Lissodelphis borealis*), Risso's dolphins (*Grampus griseus*), short-finned pilot whales (*Globicephala macrorhynchus*), Cuvier's beaked whales (*Ziphius cavirostris*), Hubb's beaked whales (*Mesoplodon carlhubbsi*), Stejneger's beaked whales (*Mesoplodon stejnegeri*), Baird's beaked whales (*Berardius bairdii*), and various unidentified beaked whales occurs further south in the California drift gillnet fishery for broadbill swordfish and common thresher shark, although the beaked whale bycatch has reduced dramatically with the use of acoustic pingers (Carretta & Chivers, 2004; Carretta & Enriquez, 2006; Carretta et al., 2008).

104. Artisanal gillnet **bycatch** is viewed as the most significant threat to the vaquita (*Phocoena sinus*) in the Gulf of California. The plight of the vaquita is particularly dire because the species exists only as a single relict population (Read, 2008). Mexico set aside a portion of the range of vaquita where gillnetting is not allowed and bought out about 1/3 of the artisanal fishing permits. The abundance in 2008 was estimated at around 250 (Gerrodette et al. 2010) and although the welcomed actions by Mexico have slowed the decline, only complete removal of gillnets from vaquita habitat will allow recovery (Gerrodette et al. 2010). The entire distribution of vaquita is restricted to a small area in the northern Gulf of California so using acoustic deterrents (pingers) could easily exclude vaquitas from this small habitat and is not an effective option. Without action the species could quickly slip towards becoming functionally extinct (D'Agrosa, 1995; Rojas-Bracho & Taylor, 1999; D'Agrosa et al., 2000; Reeves et al., 2003; Jaramillo-Legorreta et al., 2007).

II (i) South East Pacific Ocean (Pacific Latin America)

From Colombia to Cape Horn, and the associated High Seas Pacific

105. The fishing intensity and cetacean **bycatch** in this region are large and growing problems that unless addressed will lead to major losses of biodiversity. Recent research confirms this is one of the world's principal areas for concern regarding high bycatch of small cetaceans.

106. It is conceivable that total **bycatch** by the artisanal fishery is of the order of or greater than 15,000–20,000 small cetaceans annually for all of Peru and therefore one of the highest estimated unregulated takes globally. Bycaught and deliberately harpooned animals are widely used as bait (Van Waerebeek & Reyes, 1990; Lescauwat & Gibbons, 1994; Van Waerebeek & Reyes, 1994; Reeves et al., 2003; Reeves et al., 2005; Mangel et al., 2010). Common dolphins (*Delphinus* spp.) dusky dolphins (*Lagenorhynchus obscurus*), common bottlenose dolphins (*Tursiops truncatus*) and Burmeister's porpoises (*Phocoena spinipinnis*) are bycaught in

Peruvian artisanal gillnets, driftnets, and longlines, with the heaviest impact on common dolphins. Similarly, Commerson's dolphins (*Cephalorhynchus commersonii*), Peale's dolphins (*Lagenorhynchus australis*) and Chilean dolphins (*Cephalorhynchus eutropia*) are bycaught or entangled in gillnets, trammel nets and mid-water trawls. Humpback whales (*Megaptera novaeangliae*) are known to be bycaught in artisanal gillnets off the coasts of Ecuador, Colombia and Panama (Felix, 2006).

107. Populations of pantropical spotted dolphins (*Stenella attenuata*) and spinner dolphins (*Stenella longirostris*) inhabiting this region and overlapping with the previous one have been heavily affected by **bycatch** in the eastern tropical Pacific tuna fishery (Smith 1983, Wade 1993; Wade, 1995; Gerrodette, 2009). Peale's dolphins (*Lagenorhynchus australis*) are hunted as **marine bushmeat** for use as crab bait, although changes in the dynamic of this fishery may be lessening this pressure (Lescrauwaet & Gibbons, 1994; Goodall, 2009), The use of dusky dolphins (*Lagenorhynchus obscurus*) as bait in long-line and gill-net shark fisheries is significant. (Van Waerebeek & Würsig, 2009)

108. Aquaculture may also be causing **loss of habitat** of Peale's dolphin (*Lagenorhynchus australis*) and Chilean dolphins (*Cephalorhynchus eutropia*) along parts of the south eastern Pacific coastline (Ribeiro et al., 2005; Dawson, 2009; Van Waerebeek & Würsig, 2009).

II (j) Central and North West Pacific Ocean (East and South East Asia)

From the Bering Seas to the South China Sea, Gulf of Thailand and Java Sea, and the associated High Seas Pacific, but diagonally excluding the EEZs of Palau, FSM, Marshall Islands and Hawaii

109. Of particular note for this region is the recent effective extinction of the of the Yangtze river dolphin or baiji (*Lipotes vexillifer*), whose numbers were decimated by entanglement in fishing gear, electric fishing and collisions with vessels and whose **habitat was severely degraded** by the widespread damming of tributaries, construction of embankments, and blasting for channel maintenance or harbour construction (Reeves et al., 2003; Wang & Zhao, 2010). The Yangtze finless porpoise (*Neophocaena asiaorientalis asiaorientalis*) was sympatric with the baiji (*Lipotes vexillifer*), and although less immediately threatened with extinction (listed by IUCN since 1996 as Endangered), is subject to the same threats from humans (Wang et al., 2000; Braulik, 2004; Wang & Zhao, 2010).

110. The fishing intensity and cetacean **bycatch** in this region is a large and growing problem (Perrin et al., 2005). Cetacean bycatch throughout the Yellow Sea, East China Sea, Taiwan Strait and associated Pacific Ocean is significant, although often poorly or under-reported.

111. A small, population of Irrawaddy dolphins (*Orcaella brevirostris*) in the inner Malampaya Sound, Philippines, classified as "Critically Endangered" in the IUCN Red List, is currently threatened by **bycatch** in the local crab net/trap fishery (Smith et al., 2004). Irrawaddy dolphins and finless porpoises (*Neophocaena phocaenoides*) are bycaught regularly in gillnets and kelong (fish traps) and to a lesser extent in trawls in Malaysian waters (Perrin et al., 2005). Freshwater populations of Irrawaddy dolphins in two rivers – the Mahakam of Indonesia and Mekong of Vietnam, Cambodia, and southern Laos – and one population in the Songkhla Lake in Thailand – are also classified in the IUCN Red List as 'Critically Endangered', with gillnet entanglement identified as the dominant threat (Beasley et al., 2002; Kreb, 2002; Smith, 2003; Smith, 2009). Although the data have not yet been collected, it is probable that there is a high level of Indo-Pacific bottlenose dolphin (*Tursiops aduncas*) bycatch throughout this region as well (Wang & Yang, 2009). Spinner dolphins (*Stenella longirostris*) and Fraser's dolphins (*Lagenodelphis hosei*) experience substantial bycatch in the tuna driftnet fishery in Negros Oriental, Philippines (Dolar, 1994), and similar fisheries for large pelagic species operate in other parts of the country (Perrin et al., 2005). Cetaceans may also be taken in round-haul nets; one estimate for the eastern Sulu Sea was 2,000 – 3,000 per year. In a recent 'rapid-assessment' of 105 fishing villages, 67 per cent were found to have some level of cetacean bycatch, with the bycaught dolphins usually used for shark bait in longline fisheries (Perrin et al., 2005). Preliminary research indicates that the **bycatch and entanglement** of some small cetaceans in fisheries, especially finless porpoises (*Neophocaena phocaenoides phocaenoides* and *N.p asiaorientalis*), is also high in Chinese waters (Zhou & Wang, 1994).

112. Directed **hunts**, through Japanese drive, hand-harpoon and other fisheries for striped dolphins (*Stenella coeruleoalba*), killer whales (*Orcinus orca*), common bottlenose dolphins (*Tursiops truncatus*), pantropical spotted dolphins (*Stenella attenuata*), Risso's dolphins (*Grampus griseus*) and Dall's porpoises (*Phocoenoides dalli*) have led to dramatic population declines in the region. Furthermore, the belief that cetaceans compete with humans for fisheries resources has prompted the culling operations of various dolphin species around Japan (Reeves et al., 2003; Jefferson, 2009; Archer, 2009; Baird, 2009; Ford, 2009; Perrin, 2009; Wells & Scott, 2009). Cetacean gillnet bycatch in the Philippines has turned to directed net or harpoon **hunts** by artisanal fishers (Dolar et al., 1997; Perrin et al., 2005) At least 29 Philippine fishing villages have been reported to hunt cetaceans. In the southern parts of the Philippines, a group of indigenous people known as *Badjao* are known to consume dolphins as part of their traditional diet. A diminishing number of small-scale

directed hunts still occur in a few fishing villages. Harpooning of cetaceans continues illegally in Taiwan Strait and associated Pacific Ocean. Similarly, cetaceans are taken deliberately in Indonesia in large-mesh nets (so-called 'tiger nets') set in migratory corridors or island passages specifically to target large migratory marine life. (Perrin et al., 2005). Catches by two regional fisheries tiger nets set in the north-eastern Sulawesi area over an eleven-month period in 1996/97 included 577 pilot whales (may include other *globicephalines*), four baleen whales (reportedly minke but likely Bryde's whales), and 326 dolphins of unknown species as well as significant number of manta rays, whale sharks, marine turtles, dugongs, and sharks caught and processed locally mostly as pet food for export (Perrin et al., 2005).

113. Indo-Pacific humpbacked dolphin (*Sousa chinensis*) and finless porpoises (*Neophocaena phocaenoides*) are impacted by **ship strikes** around Hong Kong (Parsons & Jefferson, 2000), and a major fast-ferry lane between Hong Kong and Macao also runs through important finless porpoise habitat just south of Lantau Island (Parsons & Jefferson, 2000; Jefferson et al., 2002; Perrin et al., 2005).

114. The coastal waters of many areas of the South China Sea and the Mekong Basin are under great pressure from human activities and, although poorly documented to date, **habitat loss** in this region is likely a major cause of concern for cetaceans. The marine habitat is deteriorating through coastal development, pollution from sewage and water treatment plants, dredging for marine fill and shipping, and intensive fishing. Cetacean habitat is often poorly defined, and where it is known it is often known to be under threat. Overfishing by local fisheries and distant-water fleets in many parts of this region may lead to depletion of food resources for local cetaceans (Perrin et al., 2005). For riverine cetaceans, dams proposed and under construction in the Mekong Basin threaten Irrawaddy dolphins (*Orcaella brevirostris*) with significant habitat loss. Fixed fishing structures in Songkhla Lake are an additional habitat threat, restricting interactions with populations in the Gulf of Thailand and reducing habitat available in the lake. (Smith, 2009). The Indo-Pacific humpback dolphin (*Sousa chinensis*) is threatened by pollution, reduced prey availability and collisions with shipping vessels in the Pearl River Estuary of southern China (Wilson et al., 2008).

115. A recently recognized threat from **chemical pollution** is the dumping of mine tailing into submarine canyons. Several large mines in Sulawesi, Indonesia, dispose of their tailings in deep ocean canyons whose waters are known to support populations of sperm whales (*Physeter macrocephalus*) and various beaked whales. An acidic and metal-enriched plume may develop around the discharge sites with contaminants bioaccumulating through the food chain. In particular, sperm and beaked whales (*Ziphiidae*) could be at risk from several canyon-dumping operations active in Indonesia (Kahn, 2000). Environmental contaminants such as PCBs and DDT are considered a major threat to the condition of the Indo-Pacific humpback dolphins (*Sousa chinensis*) in Hong Kong. Detailed studies of contaminant levels on Hong Kong's population have shown high levels of organochlorines, in particular DDT, and mercury contamination. It is likely that several other regional populations of humpback dolphins are contaminated to a similar degree, and urgent research is warranted. In addition to organochlorine and trace element pollution, the impacts of butyltin, polyaromatic hydrocarbons (PAHs), tris(4-chlorophenyl)methane (TCPMe), tris(4-chlorophenyl)methanol (TCPMeOH), and sewage pollution on humpback dolphin populations should be investigated as a matter of urgency (Parsons, 2004; Hung et al., 2006). Environmental contamination by brominated flame retardants (BFRs) has become a matter of serious concern because of their persistence, bioaccumulative nature, and possible adverse effects on humans and wildlife. Hexabromocyclododecanes (HBCDs) are intensively used worldwide as a BFR. HBCDs were detected in all the blubber samples of finless porpoises (*Neophocaena phocaenoides*) and Indo-Pacific humpback dolphins (*Sousa chinensis*) collected from the South China Sea during 1990–2001, indicating environmental contamination by HBCDs in Asia may be substantial (Isobe et al., 2007).

116. Offshore oil and gas development in high-latitude areas of the Northern Hemisphere has generated numerous studies on the effects of **noise pollution** and other sources of disturbance, prompted by concern about gray whale (*Eschrichtius robustus*) populations (Brownell et al., 1997; Johnson, 2007; Webster, 2003). In particular, gray whales are subject to disturbance by activities related to the development of offshore oil and gas fields on their summer feeding grounds in the Sea of Okhotsk (Weller et al., 2002) with have a separate but unknown breeding ground in the western Pacific. Noting the concentration of shipping traffic in the South China Sea, it is probable that this is also a source of noise pollution and impact to cetaceans.

117. The expansion of **live-capture** operations directed at vulnerable coastal and riverine cetaceans may be contributing to the depletion of some local populations (Perrin et al., 2005; Burdin et al., 2007; Smith, 2009).

II (k) Pacific Islands Region

From Papua New Guinea to New Zealand, and the associated High Seas Pacific, and diagonally including the EEZs of Palau, FSM, Marshall Islands and Hawaii

118. Cetaceans in this vast oceanic region are threatened by bycatch, directed catch, introduced marine species, marine spills and ships' waste, sea-bed mining, solid waste disposal particularly in urban areas, sedimentation resulting from land clearance and increased erosion, physical alterations through destruction of

fringing reefs, beaches, wetlands and mangroves for coastal development, and the over-exploitation of coastal food fisheries (Thaman, 2002; UNEP, 2004; Miller, 2009). The region serves as habitat to a relatively high number of cetacean species on a year-round, seasonal, or more sporadic basis (Reeves et al., 1999; Miller, 2009). However, for a vast majority of these species a detailed understanding of the life history, geographic range, and habitat is lacking.

119. Estimating cetacean **bycatch** within the region is limited by the small amount of observer coverage and monitoring that takes place (Lawson, 2001; Lawson 2001b; Chapman, 2001; Manzurek, 2004). However, at least eleven species have been noted as bycaught or interacting within regional purse-seine and long-line operations, including the common bottlenose dolphin (*Tursiops truncatus*), common dolphin (*Delphinus delphis*), dusky dolphin (*Lagenorhynchus obscurus*), humpback whale (*Megaptera novaeangliae*), sperm whale (*Physeter macrocephalus*), Risso's dolphin (*Grampus griseus*), short-finned pilot whale (*Globicephala macrorhynchus*), spinner dolphin (*Stenella longirostris*), false killer whale (*Pseudorca crassidens*), killer whale (*Orcinus orca*), and ginkgo-toothed beaked whale (*Mesoplodon ginkgodens*) (Donoghue et al., 2003; Molony, 2005; Dalebout et al., 2008; SPWRC, 2008). The eastern shoreline of Australia has shark control programmes which use nets that have caused hundreds of cetacean **entanglements** (Paterson, 1990). Bycatch in set gillnet fisheries is a conservation concern for all of New Zealand's Hector's dolphins (*Cephalorhynchus hectori*).

120. A population of false killer whales that resides in near-shore waters of the Hawaiian archipelago was recently listed as endangered under the US Endangered Species Act and serves as an example of the potential impact of fisheries on pelagic populations. Bycatch estimates were made on the United States longline fleet because of interactions with endangered marine turtles and revealed substantial bycatch of depredating false killer whales. A decline in the local population was documented by researchers (Baird et al. 2009) and the population was found to be discrete and significant. It would be unlikely that the decline of this population (with threats from direct entanglement in fisheries, competition with fisheries and potentially contaminants) is unique in the Pacific Islands Region. Other fisheries likely also experience cetacean bycatch; however, considerable effort will be needed to quantify this impact.

121. In the past decade concern has been raised about **depredation** by cetaceans on fisheries in the region (Donoghue et al., 2003). Anecdotal reports of depredation from the Cook Islands, Samoa, Federated States of Micronesia, Fiji, Papua New Guinea, the northern Coral Sea, and New Zealand have noted involvement of killer whales (*Orcinus orca*), false killer whales (*Pseudorca crassidens*), pilot whales (*Globicephala macrorhynchus*), sperm whales (*Physeter macrocephalus*), rough-toothed dolphins (*Steno bredanensis*), spinner dolphins (*Stenella longirostris*), pantropical spotted dolphins (*Stenella attenuata*), bottlenose dolphins (*Tursiops* spp.), Risso's dolphins (*Grampus griseus*), striped dolphins (*Stenella coeruleoalba*), short-beaked common dolphins (*Delphinus delphis*) and Fraser's dolphins (*Lagenodelphis hosei*) (Donoghue et al., 2003). Some dangerous and inappropriate techniques have been used to deter marine mammals from these activities, including shooting and harpooning, use of underwater explosives, and the hanging of cetacean body parts on lines (Donoghue et al., 2003).

122. A drive hunt for small-cetacean **bushmeat** and dolphin teeth has been practised within the Solomon Islands group for many years (Reeves et al., 1999). Species in these hunts include spinner dolphin (*Stenella longirostris*), pantropical spotted dolphins (*Stenella attenuata*), striped dolphins (*Stenella coeruleoalba*), rough-toothed dolphins (*Steno bredanensis*), and melon-headed whales (*Peponocephala electra*) (Dawbin, 1972). Average takes have been estimated at around 840 individuals per year, with some declines (to around 500 individuals) noted in more recent years. However, during the last year there have been efforts to cease the hunts (Miller *pers comm*, 2010). Singular occurrences of cetacean hunting have also been recorded in Marshall Islands, Kiribati, Fiji and Vanuatu (Reeves et al., 1999).

123. This region is likely to face significant effects of **climate change** (SPREP, 2004). The potential impacts of climate change on cetaceans are both direct and indirect (Learmouth et al., 2006; Simmonds & Isaac, 2007). Changes in Pacific Ocean tuna distribution and abundance (Hunt 2002; Lehodey, 2001) and decline in coral reef systems (Crosby et al., 2002; Hoegh-Guldberg et al., 2000) associated with climate change are two immediate examples of this changing Pacific marine ecosystem.

124. The region has significant **chemical pollution** issues to be addressed. High nutrient levels have been noted in urban areas (Mosley & Aalsbersberg, 2003), and there are numerous cases of poorly maintained sewerage, waste systems, land-fills and mining operations (Dorfman, 2004; SPREP, 2004). Furthermore, there is a nuclear testing legacy in the northern Pacific Islands dating from between 1946 and 1958 which continues to place a heavy long-term burden on the marine ecosystems in this area (Robinson et al., 1998; Noshkin et al., 1998).

125. Concerns have been raised about the susceptibility of cetaceans to **epizootic diseases**. A few examples exist for the region (Duignan & Jones, 2005), including raised and ovoid skin lesions observed on humpback whales (*Megaptera novaeangliae*) in the waters of American Samoa (Mattila & Robbins, 2008) and *Brucella* virus in Indo-Pacific bottlenose dolphins (*Tursiops aduncus*) from the Solomon Islands (Tachibana et al., 2006).

126. Between 2003 and 2010 several hundred Indo-Pacific bottlenose dolphins (*Tursiops aduncus*) were **live captured** in the Solomon Islands for export to international captivity facilities. Although not all the animals were exported, numerous injuries and deaths were also reported in addition to the transported individuals (Parsons et al., 2010).

127. Within the Pacific Islands Region twelve different species have been documented as suffering **ship strikes** (Stone & Yoshinaga, 2000; Van Waerebeek et al., 2006; SPWRC, 2008), but at this stage this is not well quantified as a threat. **Harassment** may become an issue with the rapid growth of the cetacean tourism industry, particularly in the region's biggest operations in Tonga, Guam, New Caledonia and French Polynesia. Although these operations represent an important way of making money, it is important to recognize that interference with animals while they are resting, feeding, nursing their young, or socializing can have negative impacts on cetacean populations (Reeves et al., 2003; Bejder et al., 2006; Miller, 2009).

128. Military training and testing activities have been conducted in the Line Islands, Marshall Islands, French Polynesia and Hawaii (Crosby et al., 2002) adding to regional **noise pollution** levels. The increasing military activities and operations in Guam and the Marianas Islands are also of concern (Miller, 2009)

II (I) Indian Ocean

The whole of the Indian Ocean, Bay of Bengal, Arabian Sea, Gulf of Oman and Mozambique Chanel, and the associated High Seas

129. Cetaceans in South Asia and the Indian Ocean are subject to a wide range of threats. Habitat loss is especially critical for cetaceans with a limited range, such as the riverine and coastal dolphins. Water development projects have fragmented river dolphin populations and in some areas eliminated their habitats (Reeves et al., 2003).

130. Cetaceans, including Indo-Pacific bottlenose dolphins (*Tursiops aduncus*), Indo-Pacific humpback dolphins (*Sousa chinensis*), Irrawaddy dolphins (*Orcaella brevirostris*), spinner dolphins (*Stenella longirostris*), bottlenose dolphins (*Tursiops* spp.) and Risso's dolphins (*Grampus griseus*) are **bycaught** in gillnets and other net fisheries in the Ayeyarwady (Irrawaddy) River and along the coast of Myanmar, Sri Lanka, and in the Union of the Comoros, Mozambique, and various areas of United Republic of Tanzania. There are smaller levels of interactions between cetaceans and fisheries around Mayotte. Cetacean bycatch off the coast of Kenya is currently undocumented but is expected to occur in areas where gillnets are used. Indo-Pacific humpback dolphins (*Sousa chinensis*), bottlenose dolphins (*Tursiops* sp.), spinner dolphins (*Stenella longirostris*) and humpback whales (*Megaptera novaeangliae*) are bycaught in gillnets and on longlines in Madagascar. Electrocutation used in illegal fishing practice is a particular problem affecting a population of Irrawaddy dolphins (*Orcaella brevirostris*) (Cockcroft & Krohn, 1994; Mohan, 1994; Amir et al., 2002; Stensland et al., 2004; Kiszka et al., 2009).

131. With increasing demand for protein in the developing nations, bycatch in parts of the Indian Ocean has evolved into directed catch, as **marine bushmeat**, and threatens to greatly increase present pressure on cetacean populations (Leatherwood & Reeves, 1989; Leatherwood, 1994; Guissamulo & Cockcroft, 1997; Reeves et al., 2003; Tun, 2006; Clapham & Van Waerebeek, 2007). There are few more urgent examples of the need for alternative fishing techniques than the fisheries in the Ganges and Brahmaputra river systems of India and Bangladesh, where fishermen have used oil and body parts of Ganges River dolphins (*Platanista gangetica gangetica*) as an attractant for large catfish (*Eutropiichthys vacha* and *Clupisoma garua*) (Mohan & Kunhi, 1996; Smith & Smith, 1998; Bairagi, 1999; Sinha, 2002).

132. Anti-shark nets that protect prime bathing areas along the KwaZulu-Natal coast of South Africa are known to **entangle** cetaceans as well as the large sharks which they are meant to deter (Cockcroft, 1990; Cockcroft, 1992; Cockcroft & Ross, 1991). Intensive tuna mariculture has led to mortality through entanglement in exclusion nets in southern Australia (Kemper & Gibbs, 2001).

133. **Habitat loss** is another critical issue for this region. In Pakistan, a programme began in 2000 to rescue Indus dolphins (*Platanista gangetica minor*) that enter irrigation canals and are unable to return to the main river channel, or that become trapped in shallow pools downstream of barrages where they are unlikely to survive until the next flood season (Braulik, 2000). Indo-Pacific bottlenose dolphins (*Tursiops aduncus*) and humpback dolphins (*Sousa chinensis*) off the south coast of Zanzibar, East Africa, have been subjected to disturbance from local dolphin tourism operations during the last decade (Stensland et al., 2004). Both Ganges River dolphins (*Platanista gangetica gangetica*) and Irrawaddy dolphins (*Orcaella brevirostris*) resident in the Sundarbans mangrove forest are susceptible to habitat loss through increasing salinity and sedimentation caused by upstream freshwater withdrawals and rising sea-levels (Smith et al., 2009). **Chemical pollution** is known to be high in parts of the region, although its direct impact on cetaceans remains poorly documented.

134. Concerns have been raised about the susceptibility of cetaceans to **epizootic diseases** and biotoxins, following the mass die-off of Indo-Pacific humpback dolphins (*Sousa chinensis*) in the Persian Gulf as well as of other species elsewhere in the world (Reeves et al., 2003).

135. Research indicates that there is a consistent rise of water temperature in areas of the Indian Ocean, which is likely to be related to **climate change**. The northern Indian Ocean can be considered an “ecological cul-de-sac” where northward range shifts of marine species to cooler waters in response to warming ocean temperatures are impossible due to the geographic barrier of the Asian continent. This could potentially represent a dire threat to cetaceans in the region (Smith et al., 2010). Erosion and flooding along the some coastlines is also expected to increase.

II (m) Arctic Seas

The area north of the Arctic Circle

136. Climate change, including the impacts of ozone depletion and global warming, threaten cetaceans worldwide, but nowhere are the likely impacts more prominent than in the polar regions. **Habitat loss** through **climate change** is critical when a species is highly specialized or dependent upon particular ecological conditions at specific times of the year. The life histories, behaviours, and feeding patterns of Arctic marine mammals are temporally tuned to specific ecological conditions in specific seasons. They are thus vulnerable to changes in climate that are sudden, unidirectional, or unusually large in magnitude (Laidre et al., 2008). Global climate changes influencing biological and physical linkages between the continental shelf and ocean basin have amplified effects in the Arctic ecosystem. The sea ice of the Arctic provides an important habitat for bowhead whales (*Balaena mysticetus*), narwhals (*Monodon monoceros*) and belugas (*Delphinapterus leucas*), as well as and their ice-associated prey, and sea ice retreat is likely to affect their foraging and migration patterns. Fin (*Balaenoptera physalus*) humpback (*Megaptera novaeangliae*), common minke (*Balaenoptera acutorostrata*), gray whales (*Eschrichtius robustus*) and killer whales (*Orcinus orca*) may be poised to encroach into more northern latitudes and to remain there longer, thereby competing with extant Arctic species (Moore, 2004; Laidre & Heide-Jørgensen, 2005; Simmonds & Isaac, 2007; Moore & Huntington, 2008; Laidre et al., 2008; Moore, 2009).

137. The atmospheric transportation of **chemical pollution** represents another significant problem for arctic species. This is a legacy issue which is now difficult to do anything about it as most of these chemicals are now in the system.. Around ten per cent of the world's riverine discharge flows into the Arctic Ocean, resulting in elevated pollutant levels – a particular concern for cetaceans as marine top predators. The marine environment is particularly vulnerable to halogenated organic contaminants (HOCs), because it acts as the final sink and consequently contains the major portion of these compounds. Contaminant levels in Norwegian killer whales (*Orcinus orca*) are currently among the highest recorded for any arctic marine mammal species (Wolkers et al., 2007; Heide-Jørgensen, 2009; O’Corry-Crowe, 2009).

138. Narwhals (*Monodon monoceros*) are **hunted** in Greenland and northern Canada (Heide-Jørgensen, 2009) and belugas (*Delphinapterus leucas*) across the Arctic and sub-Arctic (O’Corry-Crowe, 2009). Bowhead whales (*Balaena mysticetus*) are hunted in Siberia, Alaska and across northern Canada (Rugh & Shelden, 2009). The eastern gray whales (*Eschrichtius robustus*) are hunted in the Chukotka Peninsula. Killer whales (*Orcinus orca*) are hunted in Greenland and are shot in parts of Alaska to reduce competition for prey (Reeves et al., 2003; Ford, 2009). Belugas are also **bycaught** in gillnets in parts of this region (O’Corry-Crowe, 2009)

Habitat degradation is apparent in the traditional benthic feeding sites for the gray whale (*Eschrichtius robustus*) in the Chukchi Sea. In recent years, the whales arrived later in Baja than normal and departed earlier. One hypothesis is that this is been due to their need to search for food resources along their migration route (Newell & Cowles, 2006). Another is that migration timing is affected by ice coverage. **Noise pollution**, in particular from oil and gas development, in high latitude areas of the northern hemisphere has prompted concern about bowhead (*Balaena mysticetus*), gray whale (*Eschrichtius robustus*) and humpback whale (*Megaptera novaeangliae*). In particular, the Critically Endangered western grey whale population is threatened by oil and gas development in its feeding ground on the Sakhalin shelf (Jones & Swartz, 2009).

II (n) Southern Ocean and Antarctic Seas

The area south of 45 degrees S

139. Like the Arctic, this region represents one of the areas likely to face the most acute effects of **climate change**. Negative ecosystem and predator-prey dynamics are likely being exacerbated by the effects of the concurrent massive extraction of finfish from the Southern Ocean (Ainley et al., 2006; Ainley et al., 2007). **Habitat loss** is critical when a species is highly specialized or dependent upon particular ecological conditions at specific times of the year. Temperature increase in Antarctica will be greater than any other region, with the possible exception of the Arctic. Reductions in the extent and duration of sea ice within the Antarctic/Southern

Ocean region would result in considerable impacts in marine production and food availability throughout the food web – including the availability of food for baleen whales.

140. **Chemical pollution** from persistent organic pollutants including PCBs, polychlorinated dibenzo-p-dioxins (PCDDs), and dibenzofurans (PCDFs), has been documented in killer whales (*Orcinus orca*) inhabiting the coastal waters around Possession Island, Crozet Archipelago, in the southern Indian Ocean. Despite inhabiting an isolated region far removed from industrial activities, these killer whales can presently be considered among the most PCB-contaminated cetaceans in the southern hemisphere (Noël et al., 2009). While concentrations of persistent organic pollutants are decreasing in the industrialized regions and in the Arctic, the global PCB distribution has not yet reached a steady state, and concentrations are expected to increase in the Antarctic before reaching a state of equilibrium (Goerke et al., 2004).

141. **Fisheries competition, bycatch and depredation** are also issues across this vast region. The international fishing industry is known to be expanding its krill harvest, further reducing this critical food source (Ainley et al., 2006; Ainley et al., 2007). Soon after longlining on Patagonian toothfish (*Dissostichus eleginoides*) started in the Southern Ocean in the second half of the 1980s, interactions of cetaceans with these fisheries became apparent. The two species primarily involved were killer whales (*Orcinus orca*) and male sperm whales (*Physeter macrocephalus*). Sperm whales became frequently **entangled** in the lines (Kock et al., 2005).

II (o) Cumulative impacts and social complexity

Cumulative impact

142. Multiple threats and impacts affect the marine environment and marine species in concert, with the potential of cumulative effects from the same threats over a period of time or from different threats impacting on the individual or group, yet current management primarily considers threats and impacts in isolation. A shift towards a more comprehensive management of these threats and impacts, taking an ecosystem-based approach to management, requires a means for evaluating their interactive and cumulative impacts as well as the need to tailor responses appropriately to regional needs. Studies evaluating effects of human activity on wildlife typically emphasize short-term behavioural responses from which it is difficult to infer biological significance or formulate plans to mitigate harmful impacts. (Prideaux, 2001; Moore & Clarke, 2002; Prideaux, 2003; Bejder et al., 2006; Weilgart, 2007; Halperna et al., 2008).

Social complexity

143. Evidence is emerging that like Primates and Proboscidea many species of Cetacea are socially complex, with individuals holding specific roles on which their social group depends. Such roles may be of importance to the welfare of other individuals or to the social group as a whole. It is possible that the details regarding migration, for instance, might be transmitted from generation to generation as part of social learning. Such transmission of information could, therefore, be lost through the removal of key individuals within a population or if an entire population with a history of using a particular area is removed. In the worst case, this could lead to a reduction in viability of a species, with increased risk of extinction, particularly where time spent at critical habitat for breeding or feeding is significantly diminished (Williams & Lusseau, 2006; Brakes & Bass, 2011; Whitehead, 2011).

144. Some scientists now argue that in cultural groups, individuals with important cultural knowledge may have population significance far in excess of their reproductive capacity (Williams & Lusseau, 2006; Brakes & Bass, 2011). Depending on the mode of transmission, migrating species that depend on information being passed from generation to generation by key individuals may be more vulnerable than species for which migration patterns are entirely encrypted into their genes. For instance, if specific individuals within a social community have a specific role in passing on information, then reducing populations could lead to the loss of important information, including potentially knowledge of migratory routes and of critical habitat for breeding or feeding.

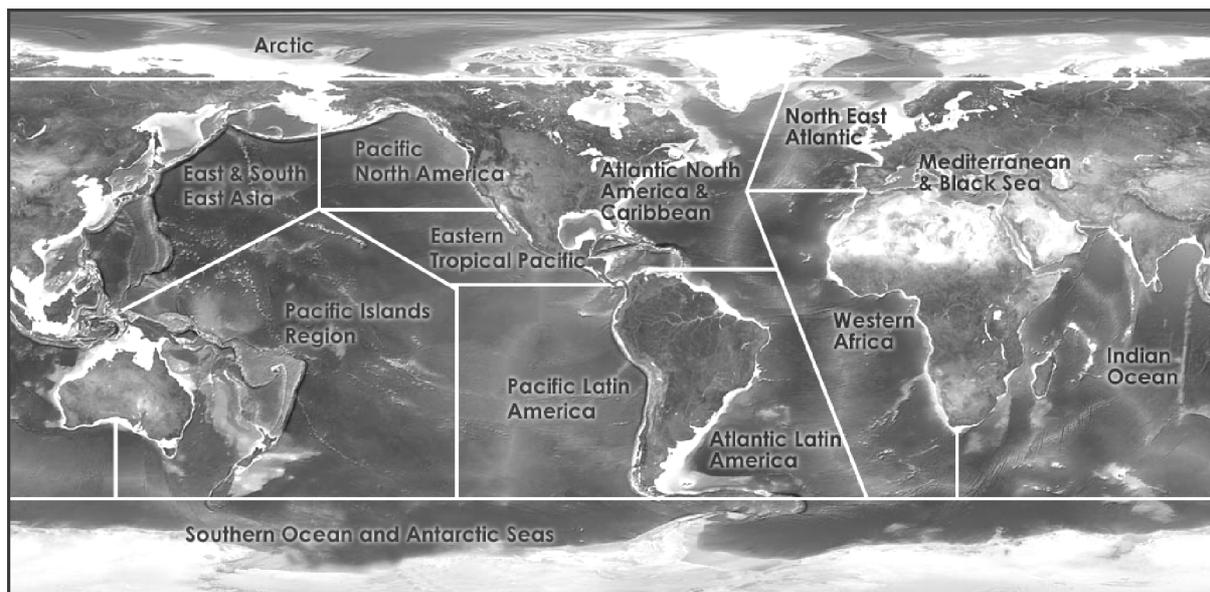
145. Since the vitality of individuals within cetacean groups maybe important to wider population health, overlaying traditional conservation approaches with consideration of ‘conservation value’ of specific individuals to the cetaceans society, and thus potentially the population, may help to develop an increasingly sophisticated means of projecting the true health of populations and groups and therefore increase the likelihood of conservation success. This would be a merging of traditional conservation measures, behavioural ecology and welfare science (Brakes & Bass, 2011).

146. Where cultural transmission has been established and quantified by researchers as important to the fitness of a cetacean group, ensuring the conservation of that knowledge becomes a modern conservation mandate for Governments to consider.

II (p) Summary of indicative importance proposed for each region

147. Based on the review information, global cooperative action to address entanglement and bycatch, climate change and whaling (other impediments to migration) are weighted as high; ship strikes, pollution, marine noise and habitat and feeding ground degradation are lower
148. In the North East Atlantic Ocean cooperative action to address entanglement and bycatch, pollution and noise pollution are weighted as high priorities; and habitat and feeding ground degradation and whaling are medium and climate change and ship strikes are lower
149. In the Mediterranean and Black Seas cooperative action to address entanglement and bycatch (including driftnet fisheries), habitat and feeding ground degradation and pollution are weighted as high priorities; ship strikes, marine noise and climate change as medium; other impediments to migrations are lower
150. In the Central and South East Atlantic Ocean (West Africa) cooperative action to address entanglement and bycatch and marine bushmeat are weighted as high priorities; pollution, marine noise and habitat and feeding ground degradation are weighted as medium; climate change and ship strikes are lower
151. In North West Atlantic Ocean (Atlantic North America and the Caribbean) cooperative action to address entanglement and bycatch, ship strikes and marine noise are weighted as high priorities; habitat and feeding ground degradation and hunting are weighted as medium; and climate change and pollution as lower
152. In the South West Atlantic Ocean (Atlantic Latin America) cooperative action to address entanglement and bycatch and marine bushmeat are weighted as high priorities; ship strikes, pollution and habitat and feeding ground degradation as medium priorities; and climate change and marine noise as lower.
153. In the North East Pacific Ocean (Pacific North America) cooperative action to address entanglement and bycatch, marine noise and habitat and feeding ground degradation and ship strikes are weighted as high priorities; pollution and whaling as medium priorities; and climate change as lower.
154. In the Central East Pacific Ocean (Eastern Tropical Pacific) cooperative action to address entanglement and bycatch is weighted as high priority; marine noise and habitat and feeding ground degradation, ship strikes, pollution and climate change as lower.
155. In the South East Pacific Ocean (Pacific Latin America) cooperative action to address entanglement and bycatch and marine bushmeat are weighted as high priorities; and climate change and ship strikes, pollution and marine noise as lower.
156. In the Central and North West Pacific Ocean (East and South East Asia) cooperative action to address entanglement and bycatch and whaling and other directed hunts, pollution and habitat and feeding ground degradation are weighted as high priorities; ship strikes and marine noise as medium priorities and climate change as lower;
157. In the Pacific Islands Region cooperative action to address entanglement and bycatch and habitat and feeding ground degradation are weighted as high priorities; climate change, pollution marine bushmeat (other impediments to migration) as medium priorities and ship strikes and marine noise as lower.
158. In the Indian Ocean cooperative action to address entanglement and bycatch, pollution, marine bushmeat habitat and feeding ground degradation are weighted as high priorities; climate change is weighted as a medium priorities; ship strikes and marine noise as lower
159. In the Arctic Seas climate change, habitat and feeding ground degradation, marine noise and hunting (other impediments to migration) are weighted as high priorities; entanglement and bycatch, pollution as medium priorities; and ship strikes as lower
160. In the Southern Ocean climate change, habitat and feeding ground degradation and whaling) are weighted as high priorities; entanglement and bycatch, pollution as medium priorities and ship strikes and marine noise as lower

Map of regions



Key	
High priority weighting	
Medium priority weighting	
Low priority weighting	

Table 1: Priority weighting for global and regional threats to cetaceans	entanglement and by-catch	climate change	ship strikes	pollution	habitat and feeding ground degradation	marine noise	other impediments to migration
Global							
North East Atlantic Ocean							
Mediterranean and Black Seas							
Central and South East Atlantic Ocean (Western Africa)							
North West Atlantic Ocean (Atlantic North America and the Caribbean)							
South West Atlantic Ocean (Atlantic Latin America)							
North East Pacific Ocean (Pacific North America)							
Central East Pacific Ocean (Eastern Tropical Pacific)							
South East Pacific Ocean (Pacific Latin America)							
Central and North West Pacific Ocean (East and South East Asia)							
Pacific Islands Region							
Indian Ocean							
Arctic Seas							
Southern Ocean and Antarctic Seas							

III. CMS and CMS cetacean-related agreements (CMS Family) addressing the listed threats

161. CMS history with cetacean conservation dates back to the first CMS COP, with the systematic inclusion of cetacean species and populations on the CMS Appendices. Recalling that endangered migratory species are listed on Appendix I of the Convention, and that CMS Parties strive towards strictly protecting these animals, conserving or restoring the places where they live, mitigating obstacles to migration and controlling other factors that might endanger them. CMS also promotes concerted action among the Range States of many of these species. Migratory species that need or would significantly benefit from international co-operation are listed in Appendix II of the Convention, and that Range States are encouraged to conclude global or regional Agreements for these species. A brief review of these decisions is therefore valuable.

162. *Resolution 1.7: Small cetaceans* (passed during the 1st CMS COP, October 1985) recognized that a number of small cetaceans should be considered for inclusion in Appendix II of the Convention at the second meeting of the Conference of the Parties the Secretariat was instructed to set up a working group on small cetaceans to take forward this work.

163. *Resolution 2.3: Small cetaceans* (passed during the 2nd CMS COP, October 1988) followed the work of the first COP and instructed the Scientific Council to give priority to a global review of the conservation status of small cetaceans, including fresh water species, with a view to establishing the case for Parties to prepare proposals for additions to Appendix II of the Convention to be considered at the 3rd CMS COP. The Secretariat and the Standing Committee were asked to take appropriate measures to envisage and facilitate Agreements between Range States for species identified by the Scientific Council.

164. *Resolution 3.3: Small cetaceans* (passed during the 3rd CMS COP, September 1991) responded to the Scientific Council's global review of the conservation status of small cetaceans. Parties and non-Parties to the Convention, which are Range States for the species and populations of small cetaceans listed by the Conference in Appendix II of the Convention, were urged to give priority to concluding agreements for their conservation. In particular Range States of the Mediterranean and Black Seas were urged to collaborate, under the sponsorship of a Party Range State, with a view to concluding under the Convention an agreement for the conservation of small cetaceans of the Mediterranean and Black Seas.

165. *Resolution 5.1: Concerted actions for Appendix I species* (passed during the 5th CMS COP, April 1997) as part of the regular review of Appendix I and II species, recommended that the concerted action species and preparation of review reports also include the Franciscana (*Pontoporia blainvillei*).

166. *Recommendation 6.2: Cooperative Actions for Appendix II species* (passed during the 6th CMS COP, November 1999) as part of the regular review of Appendix I and II species, recommended the addition of several species of dolphins of South America, namely the Franciscana dolphin, Peale's dolphin, dusky dolphin, Burmeister's porpoise, spectacled porpoise, Commerson's dolphin and Chilean dolphin (*Pontoporia blainvillei*, *Lagenorhynchus australis*, *L. obscurus*, *Phocoena spinipinnis*, *Phocoena dioptrica*, *Cephalorhynchus commersonii* and *C. eutropia*) to the list of species for cooperative action.

167. *Resolution 7.1: Concerted actions for Appendix I species* (passed during the 7th CMS COP, September 2002) as part of the regular review of Appendix I and II species, recommended that the concerted actions also include the fin whale, Sei whale, sperm whale, southern right whale, blue whale and humpback whale (*Balaenoptera physalus*, *Balaenoptera borealis*, *Physeter macrocephalus*, *Eubalaena australis*, *Balaenoptera musculus* and *Megaptera novaeangliae*). The 8th CMS COP did not expand this list.

168. *Resolution 7.15: Future Action on the Antarctic Minke, Bryde's and Pygmy Right Whales under the Convention on Migratory Species* (passed during the 7th CMS COP, September 2002) called on Parties, to take action for these species and to identify the status of the populations of these great whales, to determine the nature and scope of threats to those species and, in doing so, to address the key data and information gaps in the proposals for listing the Antarctic minke, Bryde's and Pygmy right whales (*Balaenoptera bonaerensis*, *Balaenoptera brydei* and *Caperea marginata*) on Appendix I of the Convention (listing never implemented). Parties and international and regional organizations with a role to play in the conservation of these species were urged to enhance current measures to ensure the conservation of these species.

169. *Recommendation 7.1: Cooperative Actions for Appendix II Species* (passed during the 7th CMS COP, September 2002) as part of the regular review of Appendix I and II species, recommended that finless porpoise, Indo-Pacific humpback dolphin, Indo-Pacific bottlenose dolphin, pantropical spotted dolphin, Spinner dolphin, Fraser's dolphin and Irrawaddy dolphin (*Neophocoena phocaenoides*, *Sousa chinensis*, *Tursiops aduncus*, *Stenella attenuata*, *Stenella longirostris*, *Lagenodelphis hosei* and *Orcaella brevirostris*) should be the subject of cooperative action. The 8th and 9th CMS COP (November 2005 and December 2008) did not expand this list.

170. *Resolution 9.1: Concerted and Cooperative Actions* (passed during the 9th CMS COP, December 2008) as part of the regular review of Appendix I and II species added the Ganges river dolphin and the Black Sea sub-species of the bottlenose dolphin (*Platanista gangetica gangetica* and *Tursiops truncatus ponticus*) to the list of Concerted Action Species.

Table 2: Cetaceans Listed on CMS Appendix I and II

Appendix I listed species are migratory species (or populations) for which reliable evidence, including the best scientific evidence available, indicates that the species is endangered. By the 9th CMS COP, 15 species or populations of cetaceans have been listed on Appendix I.

Appendix II listed species are migratory species (or populations) that have an unfavourable conservation status and that require international agreements for their conservation and management, as well as those that have a conservation status which would significantly benefit from the international cooperation that could be achieved by an international agreement. By the 9th CMS COP forty-three species or populations of cetaceans are listed on Appendix II.

Species	Population/notes	Appendix I/II	Concerted/ Cooperative Action
Amazon river dolphin / Boto (<i>Inia geoffrensis</i>)		II	
Antarctic minke whale (<i>Balaenoptera bonaerensis</i>)		II	
Atlantic humpback dolphin (<i>Sousa teuszii</i>)		I/II	
Atlantic white-sided dolphin (<i>Lagenorhynchus acutus</i>)	only North and Baltic Sea populations	II	
Australian snubfin dolphin (<i>Orcaella heinsohni</i>)		II	
Baird's beaked whale (<i>Berardius bairdii</i>)		II	
Beluga / White whale (<i>Delphinapterus leucas</i>)		II	
Blue whale (<i>Balaenoptera musculus</i>)		I	Yes
Bowhead whale (<i>Balaena mysticetus</i>)		I	
Bryde's whale (<i>Balaenoptera edeni</i>)		II	
Burmeister's porpoise (<i>Phocoena spinipinnis</i>)		II	Yes
Chilean dolphin (<i>Cephalorhynchus eutropia</i>)		II	Yes
Clymene dolphin (<i>Stenella clymene</i>)	West African population	II	
Commerson's dolphin (<i>Cephalorhynchus commersonii</i>)	South American population	II	Yes
Common bottlenose dolphin (<i>Tursiops truncatus ponticus</i>)	Black Sea population	I	Yes
Common bottlenose dolphin (<i>Tursiops truncatus</i>)	North Sea, Baltic Sea, Mediterranean and Black Sea populations	II	
Dall's porpoise (<i>Phocoenoides dalli</i>)		II	
Dusky dolphin (<i>Lagenorhynchus obscurus</i>)		II	Yes
Fin whale (<i>Balaenoptera physalus</i>)		I/II	Yes
Finless porpoise (<i>Neophocaena phocaenoides</i>)		II	Yes
Franciscana / La Plata dolphin (<i>Pontoporia blainvillei</i>)		I/II	Yes
Fraser's dolphin (<i>Lagenodelphis hosei</i>)	Southeast Asian populations	II	Yes
Ganges river dolphin / Susu (<i>Platanista gangetica gangetica</i>)		I/II	Yes
Guiana dolphin (<i>Sotalia guianensis</i>)		II	
Harbour porpoise / Common porpoise (<i>Phocoena phocoena</i>)	North and Baltic Sea, western North	II	

	Atlantic, Black Sea and North West African populations		
Heaviside's dolphin (<i>Cephalorhynchus heavisidii</i>)		II	
Humpback whale (<i>Megaptera novaeangliae</i>)		I	Yes
Indo-Pacific bottlenose dolphin (<i>Tursiops aduncus</i>)	Arafura / Timor Sea populations	II	Yes
Indo-Pacific humpback dolphin (<i>Sousa chinensis</i>)		II	Yes
Irrawaddy dolphin (<i>Orcaella brevirostris</i>)		I/II	Yes
Killer whale / Orca (<i>Orcinus orca</i>)		II	
Long-finned pilot whale (<i>Globicephala melas</i>) -	only North and Baltic Sea populations	II	
Narwhal (<i>Monodon monoceros</i>)		II	
North Pacific right whale (<i>Eubalaena japonica</i>)	North Pacific	I	
Northern bottlenose whale (<i>Hyperoodon ampullatus</i>)		II	
Northern right whale (<i>Eubalaena glacialis</i>)	North Atlantic	I	
Omura's whale (<i>Balaenoptera omurai</i>)		II	
Pantropical spotted dolphin (<i>Stenella attenuata</i>)	eastern tropical Pacific and Southeast Asian populations	II	Yes
Peale's dolphin / Black-chinned dolphin (<i>Lagenorhynchus australis</i>)		II	Yes
Pygmy right whale (<i>Caperea marginata</i>)		II	
Risso's dolphin (<i>Grampus griseus</i>)	only North Sea, Baltic Sea and Mediterranean populations	II	
Sei whale (<i>Balaenoptera borealis</i>)		I/II	Yes
Short-beaked common dolphin (<i>Delphinus delphis</i>)	Mediterranean population	I	
Short-beaked common dolphin (<i>Delphinus delphis</i>)	North and Baltic Sea Mediterranean, Black Sea and eastern tropical Pacific populations	II	
Southern right whale (<i>Eubalaena australis</i>)		I	Yes
Spectacled porpoise (<i>Phocoena dioptrica</i>)		II	Yes
Sperm whale (<i>Physeter macrocephalus</i>)		I/II	Yes
Spinner dolphin (<i>Stenella longirostris</i>)	eastern tropical Pacific and Southeast Asian populations	II	Yes
Striped dolphin (<i>Stenella coeruleoalba</i>)	eastern tropical Pacific and Mediterranean populations	II	
Tucuxi (<i>Sotalia fluviatilis</i>)		II	
White-beaked dolphin (<i>Lagenorhynchus albirostris</i>)	only North and Baltic Sea populations	II	

171. To date, nine of the fifteen species or populations listed on Appendix I of the Convention are designated as Concerted Action Species. Thirteen of the forty-three Appendix II species have been selected for Cooperative Actions. Details are given in table 2.

172. CMS provides advice to Parties and stakeholders on cross-cutting issues such as Environmental Impact Assessments and migratory species (e.g. *Resolution 7.2: Impact Assessment and Migratory Species* (passed during the 7th CMS COP, September 2002), oil spills and bycatch through COP resolutions and recommendations.

173. Two legally binding CMS regional Agreements have been negotiated with a focus on the conservation of cetaceans - the Agreement on the Conservation of Small Cetaceans of the Baltic, North East Atlantic, Irish and North Seas (ASCOBANS) and the Agreement on the Conservation of Cetaceans of the Black Sea, Mediterranean Sea and Contiguous Atlantic Area (ACCOBAMS). A further two non-binding Memoranda of Understanding (MOU) have also been concluded, the MOU for the Conservation of Cetaceans and their Habitats in the Pacific Islands Region (Pacific Cetaceans MOU) and the Memorandum of Understanding Concerning the Conservation of the Manatee and Small Cetaceans of Western Africa and Macaronesia (Western African Aquatic Mammal MOU). In addition, the 7th CMS COP urged the exploration of a marine mammal initiative in Southeast Asia (*Recommendation 7.4*) and the consideration of a marine mammal initiative in the Indian Ocean (*Recommendation 7.7*), which was reiterated during the 9th CMS COP with the call for an instrument on cetaceans in South-East Asia that also extended over the Indian Ocean to significantly increase the number of CMS Parties involved (*Resolution 9.2*). These existing and potential future agreements demonstrate that the Convention and its operational tools play a unique role in regional cetacean conservation.

174. ASCOBANS entered into force on 29 March 1994. The aim of the Agreement is to promote close cooperation amongst Parties with a view to achieving and maintaining a favourable conservation status for small cetaceans. ASCOBANS covers all species, subspecies or populations of toothed whales in the Agreement Area, except for the sperm whale. In 2003 the ASCOBANS Meeting of the Parties adopted a resolution concerning the extension of the geographic coverage of the Agreement to also encompass parts of the North Atlantic and the incorporation of waters adjacent to Ireland, Portugal and Spain into the Agreement area. This area extension came into force in February 2008. Bycatch is considered the most serious threat to cetacean populations in the ASCOBANS area. Marine pollution, noise pollution, habitat destruction, ship strikes, disease and competition with fisheries are further dangers.

175. ACCOBAMS, the second Agreement for cetaceans under CMS, was concluded in 1996 and entered into force in 2001. The ecosystems within the ACCOBAMS region are highly changed and disturbed, primarily due to pollution, coastal development, extensive vessel traffic, over-fishing and the impacts of introduced species. The aim of the Agreement is to promote close cooperation amongst Parties with a view to reducing threats to, and achieving and maintaining a favourable conservation status for species of cetaceans present in the Agreement area. ACCOBAMS applies to all cetaceans that have a range which lies entirely or partly within the Agreement area or that accidentally or occasionally frequent the Agreement area, which includes the whole of the Black and Mediterranean seas and the Atlantic coastal waters of North Morocco and South Portugal. In 2010, a resolution was adopted to extend the Agreement Area to the Atlantic waters of continental Portugal and Spain.

176. The Pacific Cetaceans MOU was concluded in 2006. The CMS MOU was negotiated in collaboration with the Pacific Regional Environment Programme (SPREP) to foster cooperation, build capacity and ensure coordinated region-wide actions to achieve and maintain a favourable conservation status for all cetaceans and their habitats occurring in the region, and to safeguard the associated cultural values for Pacific Island peoples. The Pacific Cetaceans MOU extends over a vast oceanic region covering an area between the Tropic of Cancer and 60 degrees South latitude and between 130 degrees East longitude and 120 degrees West longitude. Issues of importance in the MOU are directed take and by-catch, degradation and disturbance of habitats, chemical and noise pollution, decline in food availability, use and abandonment of fishing gear, ship-strikes, climate change and ozone depletion.

177. The Western African Aquatic Mammal MOU was concluded in 2008 to address direct and accidental catch, coastal and riverine development, pollution and habitat degradation that have contributed to rapid declines in West African manatee and small cetacean populations. The agreement also seeks to raise local awareness of their conservation needs related to aquatic mammals. Two action plans have been adopted by the agreement (one each for manatees and small cetaceans) and work under both has commenced.

III (a) CMS Family addressing entanglement and bycatch

178. Bycatch is one of the main concerns of CMS and its agreements. Cetaceans are known to become entangled in many gear types, including long-lines, drift nets, trap lines and mid-water trawls, but the largest problem remains with coastal gill nets, drift nets and purse-seine nets.

179. The 7th and 8th CMS COP emphasized that bycatch remains one of the major causes of mortality from human activities in the marine environment, recommending the speedy implementation of *Resolution 6.2*, which requests all Parties to strengthen measures to protect the species against bycatch (*Recommendation 7.2*). Specifically, *Resolution 6.2: By-catch* (passed during the 6th CMS COP, November 1999), recognizes the gravity of bycatch as a major threat to migratory species. The resolution urges all Parties to strengthen the measures taken to protect migratory species against bycatch by fisheries within their territorial waters and exclusive economic zones, and by vessels fishing on the high seas under their flags; to continue and strengthen measures within fisheries under their control, to minimize as far as possible the incidental mortality of migratory species listed in Appendices I and II, including seabirds, marine turtles and cetaceans; and to

highlight the serious problem of incidental mortality of migratory species listed in Appendices I and II within regional fisheries organisations.

180. *Recommendation 7.2: Implementation of Resolution 6.2 on By-Catch* (passed during the 7th CMS COP, September 2002) encourages the implementation of *Resolution 6.2* in the shortest possible period of time and an adequate assessment of its outcomes. The recommendation also urges Parties to compile information, implement schemes and encourage research proposals to mitigate bycatch and to minimise discarded gear in domestic jurisdictions and on the high seas. In the same year *Recommendation 7.3: Regional Coordination for Small Cetaceans and Sirenians of Central and West Africa* (passed during the 7th CMS COP, September 2002) highlights that threats to these species such as bycatch could, if not properly managed, lead to further decline in small cetacean and sirenian populations. The recommendation encourages all Parties in the distribution range to consider the establishment of a memorandum of understanding on these species and the implementation of collaborative actions, notably through action plans, which would consider the particular characteristics of inland and marine waters. *Recommendation 7.4: Regional Coordination for Small Cetaceans and Dugongs in Southeast Asia and Adjacent Waters* (passed during the 7th CMS COP, September 2002) specifically recognizes that illegal and indiscriminate catch of these and other large marine animals continues in Southeast Asian countries, thereby jeopardizing the integrity and viability of the marine ecosystem. The recommendation encourages all Parties and Range States in the distribution range to consider the establishment of an appropriate instrument of cooperation for the conservation of these species, which would consider the particular characteristics of inland and marine waters.

181. *Resolution 8.14: Bycatch* (passed during the 8th CMS COP, November 2005) highlights that bycatch remains one of the major causes of mortality of migratory species from human activities in the marine environment, recognizing that bycatch is seen as a priority threat to be mitigated in a number of CMS subsidiary agreements and memoranda of understanding. The Resolution calls on Parties to increase their efforts to mitigate bycatch and to appoint a Scientific Councillor with expertise in bycatch to coordinate all of the related work of the Scientific Council; and for the Scientific Council to identify emerging and best practice techniques of bycatch mitigation and make this information readily available to key range states for migratory species threatened by bycatch.

182. 9th CMS COP (*Resolution 9.18: By-Catch*) once again reaffirmed the decision of the past three CMS COPs and instigated a global review of bycatch to be completed, specifically to assess the impact of fisheries bycatch and discarding on the conservation status of migratory species covered by the Convention and to identify priority fisheries, regions and species that would benefit from cooperative action through the CMS and relevant activities; as well as increasing the exchange of information between CMS and relevant Regional Fisheries Management Organizations (RFMOs). Focusing on gill-net fisheries, this review was commissioned in 2010 and results will be considered in detail during Scientific Council 17 and COP 10.

183. In addition to this global review, CMS has also engaged in various regional bycatch-related projects. A project aimed at assessing the nature, extent, dynamics and seasonality of small cetacean exploitation off the coasts of Ghana and Togo completed successfully its field activities in 2006. The project included monitoring by observers of cetacean captures at selected fish landing sites, establishment of a permanent cetacean reference collection, capacity building and public awareness components. The project is part of a wider CMS West African Cetaceans Research and Conservation Programme (WAF CET), under which surveys, public awareness and capacity building activities have also been undertaken in Senegal, the Gambia and Guinea-Bissau between 1997 and 2001 (WAF CET-1 and 2 projects), and a Workshop on the Conservation and Management of Marine Mammals in West Africa was convened in Conakry, Guinea, in 2000.

184. A second important project aimed to train local scientists in India, Bangladesh, Myanmar and Sri Lanka in cetacean research and conservation techniques, to contribute to an assessment of the status of, and threats on cetaceans in the Bay of Bengal (notably interaction with fisheries) and to improve cooperation among the riparian states on matters concerning cetacean research and conservation, was started in December 2003 and concluded in late 2006. During 2004 a team of 14 scientists from Bangladesh, India, Myanmar, Sri Lanka and the USA conducted a vessel-based line-transect survey for cetaceans in the near-shore waters of Bangladesh. The survey was preceded by a training course on cetacean assessment techniques in 2004.

185. The focus given to bycatch as an issue over the course of the six ASCOBANS Meeting of the Parties (ASCOBANS MOPs) reinforced that bycatch is considered a primary threat to cetacean populations in the ASCOBANS area. The extent of the threat is dramatically illustrated by the decline in the population of harbour porpoises in the Baltic Sea. The harbour porpoise (*Phocoena phocoena*) is the most common cetacean species in the North Sea and the only native cetacean inhabiting the Baltic. According to the most recent estimates, the number of harbour porpoises in the Baltic Sea proper has dropped to around 600; and number in the adjacent Western Baltic region is dropping rapidly.

186. As early the 1st ASCOBANS MOP in 1994, Parties were urged to establish and/or continue independent observer schemes to assess most significant bycatches before 1996 (*Resolution 1.2: Implementation of the Conservation and Management Plan*). The Advisory Committee was given the task of

assessing information on bycatch reporting schemes from all areas, provide guidelines on best practice. Parties were also encouraged to support and cooperate on research on gear and method developments to reduce cetacean bycatch. Signalling the importance of this issue for the Agreement, the Advisory Committee was requested, in the light of work of other intergovernmental organizations and available information on cetacean population size and life-history parameters, to assess the level at which interactions between fisheries and small cetaceans become unacceptable and report this to the next ASCOBANS MOP. Researching the feeding ecology of small cetaceans was also called for. Meanwhile Parties were encouraged to introduce regulations and other management measures to reduce levels of bycatch of cetaceans in fishing gear.

187. During the 2nd ASCOBANS MOP Parties agreed to continue to investigate methods to reduce and evaluate bycatch recommending that anthropogenic removal of harbour porpoises in the central and south North Sea was reduced as soon as possible to less than 2 per cent of the current abundance estimate per year, preferably by the Third Meeting of Parties (*Resolution 2.3: Incidental Take of Small Cetaceans*). Parties also recommended that estimates of annual bycatch for North Sea set-net fisheries and pelagic trawl fisheries were gathered and requested the provision of provide an estimate of total harbour porpoise bycatch in the Skagerrak/Kattegat/Belt Sea. The Advisory Committee was requested to use these data to make estimates of annual bycatch rates in all of these fisheries. Noting the Convention on the Protection of the Marine Environment of the Baltic Sea Area (HELCOM) recommendation passed in 1992 that gave highest priority to avoiding bycatches of harbour porpoise, the ASCOBANS Parties and Range States in the Baltic Sea region together with the Advisory Committee, were to develop a recovery plan for porpoises in the Baltic Sea by 2000, which should identify the human activities that are potential threats to the recovery of this species in the Baltic, and request that competent authorities consider appropriate methods to limit such threats (HELCOM, 1992).

188. By the 3rd ASCOBANS MOP in 2000 bycatch was an even more pressing issue, and was by now also reflected in Article 12.4 of the EU Council Directive 92/43/EEC which required States to establish a system to monitor the incidental capture and killing of all cetaceans; the Statement of Conclusions at the Intermediate Ministerial Meeting on the Integration of Fisheries and Environmental Issues held in March 1997 in Bergen; CMS Resolution 6.2 on bycatch; the advice of the International Whaling Commission Scientific Committee indicating that further research should be undertaken immediately to clarify the status of the stocks of harbour porpoises; and the IWC/ASCOBANS Working Group on harbour porpoises advice that the maximum annual bycatch that achieves the ASCOBANS interim objective over an infinite time horizon, assuming no uncertainty in any parameter, is 1.7 per cent of the population size in that year. With the recommendation to reduce bycatch to less than 2 per cent of a population, preferably by the Third Meeting of Parties, still unfulfilled, the MOP recommended that total anthropogenic removal of harbour porpoises in the central and south North Sea (ICES Areas IVb and IVc) was reduced without delay by competent authorities, regardless of the time needed to establish better population data and to calculate an acceptable removal level. MOP3 also recommended the continuation of data collection in the North Sea, Skagerrak/Kattegat/Belt Sea and the Baltic Sea; and urged the continuation of work towards developing a recovery plan for porpoises in the Baltic Sea, and the promotion of integration of bycatch issues in the Common Fisheries Policies and in relevant National Fisheries Policies (*Resolution 3.3: Incidental Take of Small Cetaceans*).

189. The mandate to continue working to mitigate bycatch was further reinforced in 2004 during the 4th ASCOBANS MOP where Parties and Range States were once again urged to provide further information on levels of bycatch and if appropriate to undertake further research into bycatch mitigation measures. This was reinforced through the acknowledgement of the Ministerial Declaration of the Fifth International Conference on the Protection of the North Sea of 20-21 March 2002 (The “Bergen Declaration”), calling for the development and adoption, as soon as possible and in cooperation with the competent authorities, of a recovery plan for harbour porpoises in the North Sea; the joint OSPAR-HELCOM “Statement on the Ecosystem Approach to the Management of Human Activities” where the need for “minimizing by-catch of species which are not the intended object of commercial fishing” (Joint Ministerial Meeting of the Helsinki and OSPAR Commissions, Bremen 2003) was stressed; CMS Recommendation 7.2 which raised concern about bycatch levels; and the finding of the 1996 Northridge Review of Marine Mammal Bycatch Observer Schemes (JNCC Report No. 219), which found that a properly designed observer scheme is the best way of acquiring reliable information on bycatch, but that extrapolation from existing information on comparable gear types and areas may be necessary when an observer scheme is logistically difficult (*Resolution 4.6: Incidental Take of Small Cetaceans*).

190. The 4th ASCOBANS MOP also endorsed the development of a recovery plan for harbour porpoises in the North Sea, (*Resolution 4.10: Recovery Plan for Harbour Porpoise in the North Sea*). This was to be based on the 2002 Recovery Plan for Baltic Harbour Porpoises (Jastarnia Plan), which specifically addressed bycatch by recommending that the Baltic Range States undertake measures to reduce fishing effort of driftnet and bottom-set gillnet fisheries; clearance of “ghost nets”; actively change fishing methods away from gear known to be associated with high porpoise bycatch (i.e. driftnets and bottom-set gillnets) and towards alternative gear that is considered less harmful; acknowledge the direct and immediate link between the effort data and ongoing bycatch mitigation measures and devise a method of collecting and compiling a standardized data on fishing effort; and implement a pinger programme on a short-term basis.

191. By the 5th ASCOBANS MOP in 2006 Parties were building on the more recent European Union Council Regulation (EC) No. 812/2004 that lays down measures concerning incidental catches of cetaceans in fisheries, makes pingers mandatory in specified fisheries, requires observer monitoring in specified fisheries and phases out driftnets in the Baltic Sea; the CMS Resolution 8.14 on bycatch; and the recent SCANS II survey which provided updated abundance estimates (Doc. 26 MOP 5). While noting that previous commitments to reduce bycatch to below 'unacceptable interaction' levels had probably not been fulfilled, the Parties and Range States were once again urged to continue to reduce the bycatch of small cetaceans, provide the Advisory Committee with information on levels of bycatch, the measures undertaken to reduce bycatch, their efficacy and their wider environmental impact, and where appropriate, undertake further research into bycatch mitigation measures; as well as information on the extent, type and distribution of static gillnet and tangle net effort (*Resolution 5.5: Incidental Take of Small Cetaceans* and *Resolution 5.9: Implementation of the Jastarnia Plan*).

192. The 6th ASCOBANS MOP in 2009 set priorities for the coming triennium, noting that in view of the limited resources the Agreement would have to focus its attention strategically upon the most pressing threats. Bycatch was selected as one of two strategic priorities and efforts to engage directly with the fishing sector in order to address this issue were to be increased (*Resolution 6.3: Activities of the ASCOBANS Advisory Committee and Work Plan for the Triennium 2010-2012*). MOP6 also adopted a revised and updated version of the Recovery Plan for Baltic Harbour Porpoises (Jastarnia Plan) and the new Conservation Plan for Harbour Porpoises in the North Sea. Both action plans clearly detail which actions need to be taken in order to reduce bycatch in these two seas (*Resolution 6.1: Adoption and Implementation of the Jastarnia and North Sea Plans*).

193. The ASCOBANS Advisory Committee (AC) has consistently considered bycatch-related matters throughout its existence and continues to provide advice to Parties on this issue. Most recently, at its meeting in May 2011, an intersessional working group on bycatch was reaffirmed and new terms of reference agreed. The Group will support approaches to address the bycatch problem within fisheries fora; report to the AC on relevant projects, scientific studies and alternative gear experiments, national initiatives, work of other fora such as OSPAR, EC, ICES and HELCOM and prepare an overview of problem areas (geographical and fishery type) and the status of knowledge of the problem, monitoring and mitigation measures in place to identify gaps.

194. With the weight of the ongoing commitment to cetacean bycatch it is appropriate to assert that ASCOBANS plays a crucial role in the management of bycatch in this region.

195. During the 2nd ACCOBAMS MOP Parties (*Resolution 2.13: Pelagic Gillnets*) noted that traditional or modified pelagic gillnets, whether drifting or not, are known to represent a major source of incidental mortality for cetaceans sought to ensure that fishing operations by ACCOBAMS Parties were conducted in full accordance with the relevant existing regulations aimed at the mitigation of cetacean bycatch and that their fishing effort on pelagic drifting and non-drifting gillnets, be reported to the ACCOBAMS Secretariat. They also initiated a special action programme aimed to mitigate cetacean by-catches in the project area including data collection, independent observers, and trialling of mitigation measures, information and capacity building of fishermen. The meeting also directed the Agreement Secretariat to establish and reinforce relations with relevant organizations and in particular General Fisheries Commission for the Mediterranean, Black Sea Commission, European Commission, FAO Co-ordination to Support Fisheries Management in the Western and Central Mediterranean, Scientific Cooperation to Support Responsible Fisheries in the Adriatic Sea, Assessment and Monitoring of the Fishery Resources and the Ecosystems in the Straits of Sicily and MEDISAMAK (*Resolution 2.21 Assessment and Mitigation of the Adverse Impacts of Interactions Between Cetaceans and Fishing Activities in the ACCOBAMS Area*).

196. During their 3rd ACCOBAMS MOP Parties were convinced that the impact of Mediterranean fisheries on cetaceans (*Resolution 3.17: Conservation of the Mediterranean Common Dolphin Delphinus Delphis*) could best be addressed only by close collaboration between relevant regional fisheries and conservation bodies, during the third MOP, Parties agreed to strengthen regional coordination (*Resolution 3.8: Strengthening Collaboration with the General Fisheries Commission for the Mediterranean*) as well as drawing attention to the urgent need to reduce bycatch in the ACCOBAMS area (*Resolution 3.12: By-Catch, Competitive Interactions and Acoustic Devices*). These concerns and calls were reiterated again during the 4th ACCOBAMS MOP that was encouraged the improvement of bycatch and depredation reporting, while still reinforcing the urgent need to reduce bycatch levels in the region (*Resolution 4.9: Fisheries Interactions with Cetaceans*).

197. As both the Pacific Cetaceans MOU and the Western African Aquatic Mammals MOU are comparatively recently developed agreements, there is less documented progress on bycatch, as neither has yet finished a full term of an Action Plan nor had an assessment of progress completed. Therefore there is less documented decision making on the way forward. However, it is important to note that both agreements have identified bycatch as a major threat to be addressed in their regions.

198. The *Action Plan for the Conservation of Cetaceans and their Habitats in the Pacific Islands Region*, which forms part of the Pacific Cetaceans MOU, addresses bycatch under the theme Threat Reduction in *Objectives 2.1: Develop, test and disseminate effective mitigation techniques that reduce depredation and*

incidental by-catch and 2.2: Document the impacts of illegal, unreported and unregulated fishing on whales and dolphins in the Pacific Islands Region. Signatories, relevant IGOs and partners are to give high priority to collaboration with RFMOs, research to develop and test mitigation techniques to reduce bycatch and depredation, examination of information on illegal, unreported and unregulated fishing to better understand potential impacts on marine mammals, and collection and dissemination of information on the scale of depredation and bycatch in order to assess level of priority and possible mitigation actions. In addition, *Objective 2.8* calls for an improved understanding of unknown but potential threats to whales and dolphins, including entanglement, through the recording and documentation of anecdotal and opportunistic information.

199. Similarly, the *Small Cetacean Action Plan* of the Western African Aquatic Mammals MOU under the theme “Threat Reduction” states as *Objective 4.1: To develop, test and disseminate effective mitigation techniques and gear that reduce by-catch to sustainable levels*. Very high priority is given to the design and implementation of adequate observer programmes to assess small cetacean bycatch in relevant fisheries, as well as to Signatories’ requesting distant-water fishing nations to ensure sustainable and responsible fishing practices within the waters under the jurisdiction of the range state. Collaboration with RFMOs and sharing of information on interactions between fisheries and marine mammals, as well as tactics for mitigation, is seen as a high priority. States are equally urged to require from commercial fisheries proof of a credible strategy to minimize adverse effects of fishing operations and its stringent implementation; and to have fisheries authorities implement available bycatch reduction measures, such as alternative fishing gear and methods and excluder devices. The theme Research and Monitoring includes *Objective 5.3: Improve understanding of the causes, scope and impacts of by-catch*, which assigns very high priority to the collection and analysis of information gathered through both port-based and ship-based fisheries observer programmes, recording and reporting all bycatch of small cetaceans; and *Objective 5.7*, which is to improve understanding of un-quantified but potential threats to small cetaceans, including entanglement in lost fishing gear.

III (b) CMS Family addressing climate change

200. CMS has monitored the issue of climate change for quite some time. *Recommendation 5.5: Climate Change and its Implications for the Bonn Convention* (passed during the 5th CMS COP, April 1997) noted the increasing concern about the potential effects of climate change on populations of migratory species, the Scientific Council was instructed to review and assess the relevance of current scientific work on this issue.

201. Most recently, following a CMS Scientific Council workshop on climate change, *Resolution 8.13: Climate Change and Migratory Species* (passed during the 8th CMS COP, November 2005) recognized that climate change may significantly affect the behaviour, distribution and abundance of migratory species and may change the ecological character of their habitats. The resolution requested the Scientific Council identify priorities for future research, review the range states list for CMS species as changes in distribution are seen as a consequence of climate change; and for the Scientific Council, Secretariat and CMS agreements to produce guidance that would help CMS Parties introduce adaptation measures to help counteract the effects of climate change on migratory species. The resolution also encouraged the initiation of collaborative international research projects into the effects of climate change on migratory species and their habitats so as to better understand implications and appropriate policy responses.

202. At the 9th COP (December 2008), *Resolution 9.7: Climate Change Impacts on Migratory Species* was adopted. This resolution significantly widens the climate change-related mandate of the Convention. It calls for assessments which migratory species are most likely to be directly or indirectly threatened or impacted by climate change or related mitigation or adaptation activities and calls on Parties to reduce such threats. The Scientific Council was requested to prioritise climate change-related impacts in its work programme. In order to support this activity, a desktop study on climate change vulnerability of migratory species was commissioned to the Zoological Society of London. Ten cetacean species were examined (nine Appendix I, one Appendix II species), of which six were found to be highly vulnerable to climate change, with the other four species considered to have medium vulnerability. The full report is accessible on the CMS website. A workshop called for in the resolution has been held in June 2011 at the Tour du Valat Research Station (France) and recommendations developed there will form the basis for a draft resolution on climate change to be forwarded to CMS COP10.

203. In *Resolution 9.9: Migratory Marine Species* (passed during the 9th CMS COP, December 2008) Parties *inter alia* express their concern that migratory marine species face multiple, cumulative and often synergistic threats and that climate change impacts are among them. It requests the Scientific Council to review the latest available information on the current and predicted conservation status, in relation to the possible consequences of climate change, of all Arctic migratory marine species listed in the CMS appendices and to consider whether additional Arctic species warrant listing in light of the predicted environmental changes.

204. While climate change as an issue has been implicit in ACCOBAMS considerations, during the 4th ACCOBAMS MOP, Parties acknowledged that some climate change scenarios envisage rapid environmental changes to take place in particular in the marine ecosystems of the ACCOBAMS area, and urged Parties to

support the Scientific Committee activities and to take necessary actions to reduce anthropogenic contributions to climate change and marine acidification. The resolution instigated communications with the United Nations Framework Convention on Climate Change, as well as a series of workshops and communications designed to broaden understanding on this subject and also contribute with experience and knowledge (*Resolution 4.14: Climate Change*)

205. The Pacific Cetaceans MOU and the Western African Aquatic Mammals MOU have commenced the process of addressing climate change as indicated through their action plans. Through *Objective 2.4: Improve our understanding of the impacts of climate change on whales and dolphins the Action Plan for the Conservation of Cetaceans and their Habitats in the Pacific Islands Region* calls on relevant MEAs, scientific institutions and partners to facilitate the collation and dissemination of current knowledge of the impacts of climate change on marine mammals and their habitats. the *Small Cetacean Action Plan* of the Western African Aquatic Mammals MOU under the theme Research and Monitoring lists *Objective 5.6: Improve understanding of the effects of global environmental change on small cetaceans* calls on states to incorporate climate change considerations into conservation plans, assessments and strategies, and implement where appropriate adaptation strategies aiming and increasing the resilience of marine ecosystems and species to climate change.

III (c) CMS Family addressing ship strikes

206. Through *Resolution 8.22: Adverse Human Induced Impacts on Cetaceans* (passed during the 8th CMS COP, November 2005) CMS Parties acknowledge the potential threat that ship strikes, among others, can pose to cetaceans, and urge Parties and non-Parties exercising jurisdiction over any part of the range of cetacean species listed on the appendices of CMS, or over flag vessels which are engaged outside national jurisdictional limits, to promote the integration of cetacean conservation into all relevant sectors.

207. While not mentioning ship strikes in particular, ASCOBANS Parties expressed the need to address disturbance to small cetaceans already in *Resolution 1.2: Implementation of the Conservation and Management Plan* (passed during the 1st ASCOBANS MOP, September 1994). *Resolution 2.6: Further Implementation of ASCOBANS* (passed during the 2nd ASCOBANS MOP, November 1997) reiterates the concern.

208. During the 3rd ASCOBANS MOP (July 2000), Parties passed *Resolution 3.4: Disturbance*, which invites Parties and Range States to support research into the effects of shipping and particularly high-speed ferries and into possible ways of mitigating any adverse effects. This was followed by the much more specific *Resolution 4.5: Effects of Noise and of Vessels* (passed during the 4th ASCOBANS MOP, August 2003), which based on an ASCOBANS study which highlighted the lethal effects of ship strikes invited Parties to conduct further research on the effect of vessels, in particular high-speed ferries, on small cetaceans. This should include research on physical and behavioural effects, and be at the individual and population levels. Parties should also develop appropriate management measures and guidelines to minimise any adverse effects on small cetaceans and assess their effectiveness. The 5th MOP in *Resolution 5.4: Adverse Effects of Sound, Vessels and Other Forms of Disturbance on Small Cetaceans* (September/December 2006) reiterates these points.

209. The ASCOBANS Conservation Plan for Harbour Porpoises in the North Sea, adopted at the 6th MOP (October 2009) through *Resolution 6.1: Adoption and Implementation of the Jastarnia and North Sea Plans*, addresses ship strikes as one of the actual or potential threats to harbour porpoises in the North Sea, but gives the matter low priority compared with other impacts on the population. The Triennium Work Plan adopted as part of *Resolution 6.3: Activities of the ASCOBANS Advisory Committee and Work Plan for the Triennium 2010-2012* requires the Advisory Committee to continue to review the extent of negative effects of vessels. ASCOBANS Parties are also required to report on ship strike incidents in their annual national reports.

210. During the 3rd ACCOBAMS MOP, Parties acknowledged that large cetaceans (fin and sperm whales) are particularly threatened by impacts with vessels; and that the speed, rather than the shape or displacement, of vessels is the most significant variable in ship strikes. The meeting called for greater communication and collaboration with the shipping industry and the IMO to reduce this threat in the Agreement area and the creation of a regional database of ship collisions (*Resolution 3.14 Ships Strikes on Large Whales in the Mediterranean Sea*). The threats of ship strikes to fin whales was further reinforced through *Resolution 3.16 (Resolution 3.16: Conservation of Fin Whales in the Mediterranean Sea)*, and again during the next MOP through *Resolution 4.10 (Resolution 4.10: Ship Strikes On Large Cetaceans In The Mediterranean Sea)*

211. In 2010 a Joint IWC/ACCOBAMS workshop was held to discussion reducing the risk of collisions between vessels and cetaceans. The workshop sought to exchange, evaluate and analyse data on temporal and geographical distribution of cetaceans, shipping and reported collision incidents, with a view to: identifying priorities for mitigation in terms of species, populations and areas; and identifying ways to improve data collection and assignment of cause of death; to examine and evaluate existing mitigation approaches/ regulations, identify and assess the likely efficacy of potential new ones and make recommendations for further work, including identifying mitigation measures for priority populations/areas as appropriate and methods to examine efficacy; and to develop scientific and conservation recommendations and a two-year work plan for consideration by the IWC, ACCOBAMS, IMO and others (IWC/ACCOBAMS, 2010).

212. The *Action Plan for the Conservation of Cetaceans and their Habitats in the Pacific Islands Region* under the Pacific Cetaceans MOU addresses ship strikes under the theme “Threat Reduction” in *Objective 2.8*, which calls for an improved understanding of unknown but potential threats to whales and dolphins, including ship strikes, through the recording and documentation of anecdotal and opportunistic information.

213. The *Small Cetacean Action Plan* of the Western African Aquatic Mammals MOU has also commenced the process to address ship strikes. Under the theme “Threat Reduction” *Objective 4.7: Identify and mitigate other potential threats to small cetaceans, including ship strikes* gives high priority to the investigation of significant or localized effects, which should then influence national legislation and other processes such as Environmental Impact Assessments. In line with this, the theme Research and Monitoring includes *Objective 5.7: Improve understanding of un-quantified but potential threats to small cetaceans, including ship strikes*, which encourages the recording and documentation of anecdotal and opportunistic information of ship strikes to be able to respond if it becomes a significant threat at local, national or regional level.

III (d) CMS Family addressing pollution

214. *CMS Resolution 7.4: Oil Pollution and Migratory Species* (passed during the 7th CMS COP, September 2002) highlighted concern about the continuing negative impacts of accidental spills and other discharges of crude and refined oils and wastes with well-known negative effects on nature, different components of biodiversity, on migratory species of wildlife and their food sources, as well as the synergistic effects of lethal and chronic toxicity, thermoregulation impairment and fouling, and by habitat degradation. Concerned that there is a potential risk that significant numbers of migratory wildlife may be killed unnoticed every year in aquatic and terrestrial environments, the resolution urged Parties to develop systems and partnerships to minimize these impacts and invited the Scientific Council to consider the role CMS might play in addressing oil pollution.

215. The focus given to pollution as an issue over the course of the six ASCOBANS MOPs indicates that pollution is considered a threat to cetacean populations in the ASCOBANS area.

216. During the first MOP in September 1994 (*Resolution 1.2: Implementation of the Conservation and Management Plan*), ASCOBANS Parties requested that the Advisory Committee assess which pollutants were likely to adversely affect small cetaceans, in the light of the results of the IWC Intersessional meeting on the effects of chemical pollution on cetaceans, and to provide advice to the Parties both for management measures and further research needs. Parties were also encouraged to implement existing commitments (e.g. under HELCOM, OSPAR) to reduce polluting discharges that might have an adverse impact on cetaceans.

217. Acknowledging the IWC Workshop on Chemical Pollution and Cetaceans and the research programme on the IWC's Scientific Committee, during the 2nd ASCOBANS MOP (November 1997) Parties requested the Advisory Committee to consider ways to facilitate the development and execution of that part of the programme which addressed cause-effect relationships between harbour porpoise health and chemical pollutants, in co-operation with the IWC and other relevant bodies. The ASCOBANS Parties also urged that focus should be given to working within OSPAR and HELCOM, to achieve a significant reduction of pollutant emissions and sources in the ASCOBANS area, particularly for those pollutants where levels in small cetaceans exceeded those associated with adverse effects (*Resolution 2.4: Management and Further Research Needs to Address Effects of Pollutants on Cetaceans Health*).

218. With the increased availability of quality information, the 3rd ASCOBANS MOP (July 2000) called for the initiation and continuation of monitoring programmes for the residues of novel contaminants of particular concern, including polybrominated compounds, toxaphenes and organotin compounds and where possible these should be associated with appropriate pathological studies to provide basic data on population biology and indications for physiological effects of contaminants, thereby helping to identify significant harmful impacts at the earliest stage, leading to the swift development of appropriate conservation measures (*Resolution 3.7: Further Implementation of ASCOBANS*). ASCOBANS 4th and 5th MOPs in August 2003 and September/December 2006 urged that Parties should support the IWC POLLUTION 2000+ research programme as well as support research into the occurrence and potential effects of priority chemicals identified by OSPAR and HELCOM (including brominated flame retardants, organotin and other endocrine disrupting chemicals) with the aim of collecting information on the distribution and accumulation of these compounds and their effects, and to ensure that this information is brought to the attention of authorities responsible for the reduction of such pollution (*Resolution 4.8: Further Implementation of ASCOBANS, Resolution 5.7: Research on Habitat Quality, Health and Status of Small Cetaceans in the Agreement Area*).

219. The ASCOBANS Conservation Plan for Harbour Porpoises in the North Sea, adopted at the 6th MOP (October 2009) through *Resolution 6.1: Adoption and Implementation of the Jastarnia and North Sea Plans*, addresses chemical pollution as one of the actual threats to harbour porpoises in the North Sea, with a medium priority and the recommendation to examine cause-effect relationships within a population dynamics framework. The Advisory Committee has been requested to continue to review annually new information on pollution and its effects and, on the basis of this review, provide recommendations to Parties and other relevant

authorities. ASCOBANS Parties are also required to report on main types of pollution and hazardous substances (including source, location and observed effects on cetaceans) and to provide information on any new measures taken to reduce pollution likely to have an impact.

220. Pollution is also identified as a threat to cetaceans in the Pacific. The *Action Plan for the Conservation of Cetaceans and their Habitats in the Pacific Islands Region* under the Pacific Cetaceans MOU includes *Objective 2.7: Minimize impacts of pollution on whales and dolphins*. The key concerns here are plastics and marine debris. Actions foreseen for Signatories and partners include improved waste management at community and national levels, collecting information on the potential impact of plastics and fishing gear on whales and dolphins, and requesting that where possible necropsies include examination for plastic ingestion. The theme “Research and Monitoring” also addresses pollution through *Objective 8.3: Identify significance of and priorities for toxicological research*, which however is given low priority.

221. Under the theme Threat reduction, the *Small Cetaceans Action Plan* of the Western African Aquatic Mammals includes *Objective 4.3: Promote reduction and ultimate elimination of chemical pollution or debris that affect small cetaceans*. High priority is given to minimizing chemical pollution of the marine environment, promoting best practice in accordance with global standards in relevant industries and ensuring appropriate management of Particularly Sensitive Sea Areas (PSSAs). Signatories are also encouraged to undertake awareness campaigns and improve waste management and reduction measures to reduce non-biodegradable waste in the marine environment. *Objective 5.5: Identify significance of and priorities for toxicological and pathological research* under the theme Research and Monitoring calls for several high priority actions: to investigate the need and opportunities for toxicological and pathological research; to identify suitable laboratories for toxicological pathological analysis and facilitate exchange of information; and to put expertise and results of research at the disposal of the region.

III (e) CMS Family addressing habitat and feeding ground degradation

222. Habitat and feeding ground degradation has been an important part of the CMS work programme through the species agreement development.

223. In 1994, CMS attention was being focused specifically on small cetaceans, with *Recommendation 4.2: Research on migration in small cetaceans* (passed during the 4th CMS COP, June 1994) recognizing that the migratory behaviour of most small cetaceans in most regions was scientifically very poorly known, making the nature and scope of international conservation problems difficult to determine, and making regional and international co-operation difficult to achieve. Parties were urged to carry out scientific studies to investigate and describe the migrations of small species in their waters, giving priority to species and populations of threatened or uncertain status. Parties with expertise were urged to assist other Parties and other Range States through appropriate mechanisms such as Memoranda of Understanding with this work.

224. In 2002, *Recommendation 7.3: Regional Coordination for Small Cetaceans and Sirenians of Central and West Africa* (passed during the 7th CMS COP, September 2002) highlighted that threats to these species, notably destruction or modification of habitats by the development of coastal areas and of the riverbanks of inland waters, pollution, agriculture if not properly managed, led to further decline in small cetacean and sirenian populations. The recommendation encouraged all Parties in the distribution range to consider the establishment of a Memorandum of Understanding on these species and the implementation of collaborative actions, notably through action plans, which would consider the particular characteristics of inland and marine waters.

225. *Recommendation 7.4: Regional Coordination for Small Cetaceans and Dugongs in Southeast Asia and Adjacent Waters* (passed during the 7th CMS COP, September 2002) recognized that threats to these species included habitat destruction and modification due to coastal and river bank development, and pollution. The recommendation encouraged all Parties and Range States in the distribution range to consider the establishment of an appropriate instrument of cooperation for the conservation of these species, which would consider the particular characteristics of inland and marine waters.

226. CMS has also conducted a number of small scale projects that have sought to understand and assist in the identification and conservation of cetacean habitat. These include a project aimed at investigating key aspects of the biology and ecology of the Franciscana dolphin (*Pontoporia blainvillei*); a survey of small cetaceans in the Timor Sea; a project on investigating the status of cetaceans in the Gulf of Tonkin and capacity-building among local researchers; and most recently a project investigating *inter alia* whether the Atlantic humpback dolphin still occurred in Cameroonian waters.

227. A review of small cetacean distribution, behaviour, migration and threats was completed in 2003, aimed at providing an up to date and comprehensive overview of available information on small cetacean migration and related conservation issues on a worldwide scale. It attempted to point out in particular geographic areas and species for which presently available knowledge suggests the opportunity of strengthening cooperation among the range states and areas and species for which important gaps in information are evident,

and for which research and monitoring efforts are to be recommended as a matter of priority in order to provide the scientific/technical background for species management. A completely revised and updated edition of this review, now including all toothed whale species, was published in early 2010 and is available on the CMS website.

228. The ASCOBANS Area is one experiencing intensive human activities. Accordingly, habitat and feeding ground degradation is an issue of concern and site specific protection is considered important.

229. During the first MOP in 1994, Parties were encouraged to introduce guidelines to reduce disturbance and to work with other regional bodies such as HELCOM, the Common Wadden Sea Seals Secretariat and the European Union to establish criteria that would define protected areas for small cetaceans (*Resolution 1.2: Implementation of the Conservation and Management Plan*). The 2nd, 3rd and 4th ASCOBANS MOPs continued this focus asking Parties to continue or initiate research aimed at identifying the location of any further suitable areas, and to implement appropriate management actions in these areas to ensure the protection of small cetaceans and to reduce disturbance to small cetaceans (*Resolution 2.4: Management and Further Research Needs to Address Effects of Pollutants on Cetaceans Health; Resolution 2.6: Further Implementation of ASCOBANS; Resolution 3.7: Further Implementation of ASCOBANS*).

230. In 2007 a joint ECS/ASCOBANS/ACCOBAMS Workshop was held to analyse and discuss the development, the scope and appropriateness of possible criteria for determining protected areas relevant to cetaceans (e.g. high-density areas, feeding or breeding sites, and migration corridors) including a discussion of potential methods to identify such sites. The workshop also aimed to explore the efficacy of MPAs as a tool in conserving cetaceans and how this could be improved in the context of the European policy environment that includes the relationship between the EU Habitats Directive, OSPAR, HELCOM, the Barcelona Convention, IWC, and ASCOBANS and ACCOBAMS. (ECS/ASCOBANS/ACCOBAMS, 2007)

231. During the 2nd ACCOBAMS MOP Parties acknowledged that habitat protection is fundamental to cetacean conservation and that in the ACCOBAMS area co-operation was needed to create and maintain a network of specially protected areas. The ACCOBAMS Parties also were among the first to consider highly migratory species needing protected areas of a sufficient extent and as such require frequently transboundary cooperation (*Resolution 2.14 Protected Areas and Cetacean Conservation*). They urged Mediterranean Parties, separately or jointly, to make a wide use of the Specially Protected Areas of Mediterranean Importance (SPAMI) concept to protect areas having importance for cetacean conservation, particularly in transboundary areas or areas beyond their jurisdictions; and for the Black Sea Parties to explore transboundary cooperation through the Black Sea Biodiversity and Landscape Conservation Protocol to the Bucharest Convention in order to establish protected areas devoted to cetaceans conservation. At the same meeting drew attention to ecological role of the exploited marine living resources and the need for prey protection for cetaceans in the Agreement area (*Resolution 2.20 Conservation Plan for Short-Beaked Common Dolphins (Delphinus delphis) and Resolution 2.25 Prey Depletion*)

232. The 3rd ACCOBAMS MOP once again drew attention to general threats compounded by habitat loss for Black Sea cetaceans and once again reinforced the need for habitat protection, identify 18 separate areas of species importance to cetaceans in the Mediterranean and Black Seas as well as repeating their call for urgent action to be taken to protect common dolphin prey and habitat (*Resolution 3.11: Conservation Plan for Black Sea Cetaceans, Resolution 4.13: Conservation of the Mediterranean Short-Beaked Common Dolphin and Resolution 3.22: Marine Protected Areas for Cetaceans*). The 4th ACCOBAMS MOP further reinforced the need for regional coordination and for the Scientific Committee to concentrate efforts on gather necessary data for progressing Marine Protected Areas (MPAs) in the future (*Resolution 4.15: Marine Protected Areas of Importance for Cetaceans Conservation*)

233. The Pacific Cetaceans MOU and the Western African Aquatic Mammals MOU address habitat and feeding ground degradation through their action plans. The *Action Plan for the Conservation of Cetaceans and their Habitats in the Pacific Islands Region* under the Pacific Cetaceans MOU includes three relevant objectives. Under the theme “Threat Reduction” *Objective 2.7: Ensure coastal development takes account of potential impacts on whale and dolphin populations*, Signatories give high priority to including consideration of impacts on whales and dolphins in national legislative and environmental impact assessment (EIA) processes. They are also called upon to identify particular localized areas and populations and develop appropriate monitoring and mitigation of any significant impacts and to communicate such information to decision makers. The theme Ecosystem / Habitat Protection includes *Objective 3.1: Support the designation and management of national whale/marine sanctuaries in the EEZs of SPREP members* and *Objective 3.2: Identify key critical habitat, hotspots and migratory pathways that are candidates* and not only assigns high priority to the declaration of marine protected areas for whales and dolphins, but also calls for an evaluation whether they are a suitable method and benefit the protection of cetaceans and their habitats.

234. The Western African Aquatic Mammals MOU *Small Cetaceans Action Plan* under the theme Ecosystem and Habitat Protection includes *Objective 3.1: Minimize the ecological impact of fisheries on small cetaceans by using the ecosystem approach to fisheries* identifies three actions with very high priority: to

convene a workshop on potential intergovernmental approaches to reducing effects of fisheries on small cetaceans in the African Eastern Atlantic Basin; to promote responsible fishing practices, also taking into account food chain impacts and other fisheries interactions and enforce existing regulations for sustainable ecosystem management; and to provide alternative livelihoods for fishing communities. In *Objectives 3.2: Identify key critical habitats, hotspots and migratory pathways that are candidates for improved conservation* and *3.3: Support the designation and management of national and transboundary marine protected areas* Signatories see the highest priority in facilitating the conservation and restoration of critical ecosystem components such as mangroves and estuaries, while also stressing the need to support the management and establishment of networks of MPAs in areas that serve as habitats and/or provide important food resources for small cetaceans. The theme “Threat Reduction” also addresses habitat quality through *Objective 4.6: Ensure all littoral developments and activities take into account effects on small cetacean populations and the environment*. The identification of particular localized areas and populations and the setting up of appropriate monitoring and mitigation of any significant impacts are seen as a very high priority, with high priority also given to providing information on potential effects of coastal and offshore development to decision-makers and the public and to ensuring best practice according to global standards in coastal and offshore activities, including those related to oil and gas exploration and exploitation and other extraction industries to minimise disturbance to small cetaceans.

III (f) CMS Family addressing marine noise

235. In 2002, *Resolution 7.5: Wind Turbines and Migratory Species* (passed during the 7th CMS COP, September 2002) noted that wind turbines especially in marine areas represent a new technique of large scale energy production, the actual effects of which on nature and on different components of biodiversity could not be fully assessed or predicted at the time. The resolution recognized the lack of sufficient and relevant research on such effects, especially on nature, and the lack of data on the distribution and migration of species concerned, while noting concern about the possible negative impacts of wind turbines on migratory species of mammals and birds, as well as on their food sources and habitats. The resolution requested the Parties to assess the possible impacts on migratory species of wind energy parks before authorizing construction and instructed the Scientific Council to assess existing and potential threats from offshore wind turbines in relation to migratory mammals and birds, including their habitats and food sources, to develop specific guidelines for the establishment of such plants and to report to the Conference of the Parties accordingly at its next meeting.

236. In *Resolution 8.22: Adverse Human Induced Impacts on Cetaceans* (passed during the 8th CMS COP, November 2005) CMS Parties acknowledge the potential threat that marine noise, among others, can pose to cetaceans, and urges Governments exercising jurisdiction over any part of the range of cetacean species listed on the appendices of CMS, or over flag vessels which are engaged outside national jurisdictional limits, to promote the integration of cetacean conservation into all relevant sectors.

237. At the 9th CMS COP in December 2008 *Resolution 9.19: Adverse Anthropogenic Marine/Ocean Noise Impacts on Cetaceans and Other Biota* was passed. The resolution recognizes that ocean noise is a form of pollution that can have effects on habitats and species and that underwater sound travels fast and over vast areas unrestricted by national boundaries and is increasing. Most importantly, it reaffirms that the difficulty of proving possible negative impacts of acoustic disturbance on cetaceans necessitates a precautionary approach in cases where such an impact is likely. The resolution thus urges Parties to take special care and to endeavour to control the impact of noise emissions. Special focus is placed on high intensity active naval sonars, for which mitigation measures are recommended. The need for consultations with any stakeholder conducting activities known to produce underwater noise pollution with the potential to cause adverse effects on marine mammals and other biota is stressed. Necessary research and monitoring activities are listed and collaboration on this issue with CMS daughter agreements and other bodies is encouraged. Parties are invited to strive to ensure that their activities falling within the scope of the resolution avoid harm to cetaceans and other biota.

238. Dealing with an area subject to intense human activity, many of which produce significant levels of anthropogenic underwater noise, ASCOBANS has considered marine noise a threat to cetacean from early on.

239. The 2nd ASCOBANS MOP sought to collect available information on the location and extent of seismic activities in the ASCOBANS and neighbouring areas during 1997 and 1998, and provide details of any mitigation measures taken to reduce possible effects of such activities on small cetaceans (*Resolution 2.6: Further Implementation of ASCOBANS*, November 1997)

240. The 3rd ASCOBANS MOP (July 2000) focused specifically on this issue inviting Parties and Range States to introduce guidelines and other measures to reduce marine noise disturbance to small cetaceans, and specifically to develop procedures for seismic surveys that provide the opportunity to a) alter the timing of surveys or to minimize their duration; b) reduce noise levels as far as practicable; c) avoid starting surveys when cetaceans are known to be in the immediate vicinity; d) introduce further measures in areas of particular importance to cetaceans; and e) develop a monitoring system that will enable adaptive management of seismic survey activities. There was a call to work with military authorities to introduce codes of conduct and similar

measures - such as environmental impact assessments and standing orders - to reduce disturbance to small cetaceans and for Parties and Range States to report to the Advisory Committee in 2003 on approaches to reducing disturbance to small cetaceans by military activities. Support was sought to further research into: the effects on small cetaceans of acoustic devices used to keep marine mammals away from nets, fish farms or other sites; the effects of shipping and particularly high-speed ferries and into possible ways of mitigating any adverse effects; and on behavioural changes in cetaceans caused by acoustic disturbance; this research should, if possible, encompass biologically significant effects. The European Cetacean Society was invited to elaborate a protocol for the removal of cetaceans' ears from carcasses to be investigated for possible damage to the auditory system as part of further research into possible effects of noise on the hearing of cetaceans (*Resolution 3.4: Disturbance*).

241. In 2003 and again in 2006 and 2009 the 4th, 5th and 6th ASCOBANS MOPs continued this focus, reaffirming that the difficulty of proving the detrimental effects of acoustic disturbance on cetaceans necessitates a precautionary approach in dealing with this issue (*Resolution 4.5: Effects of Noise and of Vessels; Resolution 5.4: Adverse Effects of Sound, Vessels and Other Forms of Disturbance on Small Cetaceans; Resolution 6.2: Adverse Effects of Underwater Noise on Marine Mammals during Offshore Construction Activities for Renewable Energy Production*).

242. With the results of the report *Shipping as a possible source of disturbance to cetaceans in the ASCOBANS region* on the effects of noise and of collisions on cetaceans, which range from disturbance to potential lethal consequences from some military sonar and from ship strikes, and noting CMS Resolution 7.5 on wind turbines and migratory species and CMS Resolution 8.22 on adverse human induced impacts on cetaceans and recognizing the potential disturbance caused by offshore extractive industries and other activities including those associated with renewable energy as well as the commitment of Parties to a change to using renewable sources of energy and the political sensitivities in relation to military activities, the 5th ASCOBANS MOP repealed the previous Resolutions and requested Parties and Range States that had not yet done so to introduce guidelines on measures and procedures for seismic surveys in order to minimize risks to small cetaceans following current best practice. In addition the new Resolution reiterated and extended an invitation to Parties and Range States to develop, with military and other relevant authorities, effective mitigation measures including environmental impact assessments and relevant standing orders to reduce disturbance of, and potential physical damage to, small cetaceans; and to conduct further research into the effects on small cetaceans of:

- a. vessels, particularly high speed ferries;
- b. acoustic devices used by the fishing and fish-farming industries including deterrent (scarers) and warning (pingers) devices and fish-finding sonar;
- c. extractive and other industrial activities, including windfarms;
- d. other acoustic disturbances;

noting that this research should include the examination of physical and behavioural effects, and be at the individual and population level. In addition the Resolution articulated the need to conduct research and develop appropriate management measures, guidelines and technological adaptations to minimize any adverse effects on small cetaceans of the above sound sources; develop and implement procedures to assess the effectiveness of any guidelines or management measures introduced; report on high energy seismic surveys per one degree by one degree rectangle using shot point density (*Resolution 5.4: Adverse Effects of Sound, Vessels and Other Forms of Disturbance on Small Cetaceans*)

243. At the 6th MOP (October 2009), ASCOBANS Parties identified marine noise as one of the strategic priority issues for the Agreement in the triennium 2010-2012 (*Resolution 6.3: Activities of the ASCOBANS Advisory Committee and Work Plan for the Triennium 2010-2012*). The Triennium Work Plan requires the Advisory Committee to continue reviewing the negative effects of sound and to review relevant technological developments and best practices with a view to developing guidelines which Parties may use to reduce disturbance by noise. In order to facilitate this activity, in 2008 an intersessional working group was established, which focused on three main human activities: use of sonar, seismic surveys and pile-driving. For each of these subjects, the working group examined the impact mitigation activities with regard to noise; summarized the assessments that have been made; indicated the main concerns relevant to the ASCOBANS objectives; and identified or prepared guidelines or recommendations for best practice. The final report of the working group is available as AC17/Doc.4-08. At the 17th Advisory Committee Meeting new terms of reference were agreed for the working group, which was to monitor and report back on relevant activities in other fora, review new literature, progress joint work on underwater noise with ACCOBAMS and OSPAR and evaluate the implementation of Resolution 6.2. Following the report to the next Advisory Committee Meeting (AC18/Doc.4-08), slightly revised terms of reference were agreed for work to be undertaken in 2011/12, with a strong focus on collaboration with the ACCOBAMS noise working group in order to prepare industry-specific concrete guidelines for noise mitigation (Annex 8 of AC18 Report, 2011).

244. *Resolution 6.2: Adverse Effects of Underwater Noise on Marine Mammals during Offshore Construction Activities for Renewable Energy Production*, also adopted at the 6th ASCOBANS MOP, calls for

guidelines to address the adverse effects of underwater noise on marine mammals from such construction activities. Noting that offshore construction of wind farms is expected to increase exponentially throughout the Agreement Area in the coming years, particular concern is expressed about the pile driving necessary for constructing most types of wind farms, which creates very high sound pressure levels. Noting the difficulty of proving long-term detrimental effects of acoustic disturbance on cetaceans, governments agreed that a precautionary approach is necessary in dealing with activities associated with renewable energy.

245. In 2007, ASCOBANS convened a workshop on *Offshore Wind Farms and Marine Mammals* with the European Cetacean Society (ASCOBANS/ECS, 2007).

246. The 2nd ACCOBAMS MOP paid special and focused attention to marine noise, and has continued to do so at each subsequent meeting. It was among the first MEAs to acknowledge that cetaceans are particularly vulnerable to disturbance at certain stages of their life cycle and that there was need to minimize adverse effects of fisheries on the conservation status of cetaceans. ACCOBAMS adopted guidelines for technical measures to minimize cetacean-fishery conflicts in the Mediterranean and Black Seas and urged all Parties to strictly regulate the use of ‘acoustic harassment devices’ in the Agreement area (*Resolution 2.12: Guidelines for the Use of Acoustic Deterrent Devices*). At the same meeting they recognized that anthropogenic ocean noise was a form of pollution, comprised of energy, that could have adverse effects on marine life ranging from disturbance to injury and mortality, and voicing concern that, over the last century, noise levels in the world’s oceans generally, and in the Agreement area in particular, had increased as a result of human activities such as, but not exclusively, commercial shipping, oceanographic and geophysical research, military testing and training, shoreline development, oil and gas exploration, and aquaculture. The meeting encouraged Parties to consult with any profession conducting activities known to produce underwater sound with the potential to cause adverse effects on cetaceans, such as the oil and gas industry, oceanographic and geophysical researchers, military authorities, shoreline developers, and the aquaculture industry, recommending that extreme caution be exercised in the ACCOBAMS area, as well as for the development of alternative technologies (*Resolution 2.16: Assessment and Impact Assessment of Man-Made Noise*)

247. The 3rd ACCOBAMS MOP articulated guidelines for appropriate noise limits and the need to reducing noise pollution (*Resolution 3.10: Guidelines to Address the Impact of Anthropogenic Noise on Marine Mammals in the ACCOBAMS Area*), and well as once again drawing attention to the negative impacts of ‘acoustic harassment devices’ (*Resolution 3.12: By-Catch, Competitive Interactions and Acoustic Devices*). The 4th ACCOBAMS MOP further reinforced previous calls, as well as mandating the Secretariat and the Scientific Committee to establish a common working group with CMS, ASCOBANS and Pelagos in order to develop appropriate tools to assess the impact of anthropogenic noise on cetaceans, measures to mitigate such impacts and coordination of efforts with the Coordination Unit for the Mediterranean Action Plan, the Commission on the Protection of the Black Sea Against Pollution, the Secretariat of the OSPAR Convention for the Protection of the Marine Environment of the North-East Atlantic and the International Maritime Organization (IMO) (*Resolution 4.17: Guidelines to Address the Impact of Anthropogenic Noise on Cetaceans in the ACCOBAMS Area*)

248. In the Pacific Cetaceans MOU *Action Plan for the Conservation of Cetaceans and their Habitats in the Pacific Islands Region* ocean noise is addressed under the theme “Threat Reduction”, where *Objective 2.8: Improve understanding of unknown but potential threats to whales and dolphins, including acoustics* is asking Signatories to identify any significant source of acoustic noise pollution that could affect whales and dolphins.

249. The Western African Aquatic Mammals MOU *Small Cetaceans Action Plan* under the theme “Threat Reduction” includes *Objective 4.4: Promote reduction and elimination of acoustic pollution*, assigning high priority to minimizing acoustic pollution of the marine environment; developing and promoting the use of guidelines for ship-based operations, extraction industries, military and recreational activities in order to reduce the noise levels in the marine environment; and asking research institutions to collect information on the potential impact of noise on small cetaceans. The theme “Research and Monitoring” also addressed this point in *Objective 5.7: Improve understanding of un-quantified but potential threats to small cetaceans, including acoustic or seismic disturbance*. Signatories and research institutions are asked to give high priority to identifying significant sources of acoustic pollution that could affect small cetaceans in the region.

IV. MEAs and processes indentified in Resolution 8.22 addressing the listed threats

IV (a) United Nations Open-ended Informal Consultative Process on Oceans and the Law of the Sea

250. The United Nations Convention on the Law of the Sea (UNCLOS) provides for the general obligation to protect and preserve the marine environment (art.192). States are required to take, individually or jointly as appropriate, all measures consistent with this Convention that are necessary to prevent, reduce and control pollution of the marine environment from any source. They are also required to take all measures necessary to ensure that activities under their jurisdiction or control are so conducted as not to cause damage by pollution to other States and their environment, and that pollution arising from incidents or activities under their jurisdiction or control does not spread beyond the areas where they exercise sovereign rights. The measures taken shall include those necessary to protect and preserve rare or fragile ecosystems as well as the habitat of depleted, threatened or endangered species and other forms of marine life (art.194).

251. Article 65 of UNCLOS requires States to cooperate with a view to the conservation of marine mammals and in the case of cetaceans to work in particular through the appropriate international organizations for their conservation, management and study. This is also applicable to the conservation and management of marine mammals in the high seas (art.120).

252. Annually, the General Assembly of the United Nations undertakes a review of developments in ocean affairs and the law of the sea, including matters related to the implementation of UNCLOS and its implementing Agreements. In doing so, the Assembly, through its resolutions on oceans and the law of the sea and on sustainable fisheries, has called for a number of actions to address, inter alia: bycatch; the impacts of climate change; pollution from all sources, including from ships, land-based sources and marine debris; physical degradation and destruction of marine habitats; and ocean noise (see, for example, UNGA A/RES/61/105, 2006; A/RES/61/222, 2006; A/RES/62/177, 2007; A/RES/62/215, 2007; A/RES/63/111, 2008; A/RES/63/112, 2008; UNGA A/RES/64/71, 2009; A/RES/64/72, 2009; A/65/37A, 2010; A/RES/65/38, 2010)

253. In 1999, the General Assembly established the United Nations Open-ended Informal Consultative Process on Oceans and the Law of the Sea (Informal Consultative Process) in order to facilitate its annual review of developments in ocean affairs and the law of the sea, with an emphasis on identifying areas where coordination and cooperation at the intergovernmental and inter-agency levels should be enhanced (UNGA Resolution 54/33). While initially established for a 3-year period, the mandate of the Informal Consultative Process has been extended by the General Assembly five times, most recently in 2010 for a period of two years.

254. The Informal Consultative Process has not specifically focused its discussions on the threats to cetaceans listed in resolution 8.22. However, since its establishment, it has considered a number of issues of relevance. For example, the Consultative Process has focused its discussions on the following topics: “ecosystem approaches and oceans” (A/61/156, 2006); “fisheries and their contribution to sustainable development”, , and “marine debris” (A/60/99, 2005); “new sustainable uses of the oceans, including the conservation and management of the biological diversity of the seabed in areas beyond national jurisdiction” (A/59/122, 2004); “protecting vulnerable marine ecosystems” (A/58/95, 2003); and the “protection and preservation of the marine environment” (A/57/80, 2002).

255. In discussing those issues, the Consultative Process has identified a number of management options, which are of relevance in preventing and mitigating the threats to cetaceans listed in resolution 8.22, including the implementation of ecosystem approaches, integrated ocean management, area-based management tools and environmental impact assessments.

256. It is also worth noting that, in 2004, the General Assembly established the Ad Hoc Open-ended Informal Working Group to study issues relating to the conservation and sustainable use of marine biological diversity beyond areas of national jurisdiction. The Working Group, which has met four times since 2006, has the mandate to: survey the past and present activities of the United Nations and other relevant international organizations with regard to the conservation and sustainable use of marine biological diversity beyond areas of national jurisdiction; examine the scientific, technical, economic, legal, environmental, socio-economic and other aspects of these issues; identify key issues and questions where more detailed background studies would facilitate consideration by States of these issues; and indicate, where appropriate, possible options and approaches to promote international cooperation and coordination for the conservation and sustainable use of marine biological diversity beyond areas of national jurisdiction (UNGA A/RES/59/24, 2004).

257. Recently, at the request of the General Assembly, the Working Group has focused its discussions on the relevant legal regime on marine genetic resources in areas beyond national jurisdiction in accordance with the United Nations Convention on the Law of the Sea; issues of marine protected areas; and issues of

environmental impact assessment processes (see UNGA A/61/65, 2006; A/63/79, 2008; A/65/68, 2010; and A/66/119, 2011). At the last meeting of the Working Group, the particular vulnerability of cetaceans was highlighted and the need to elaborate a collective policy, in conformity with the provisions of the United Nations Convention on the Law of the Sea and relevant international law, to ensure full and permanent protection for cetaceans on the high seas was raised in the discussions.

IV (b) Convention on International Trade in Endangered Species of Wild Fauna and Flora

258. The Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) aims to ensure that **international trade** in specimens of wild animals and plants does not threaten their survival. Because the trade in wild animals and plants crosses borders between countries, the effort to regulate it requires international cooperation. Today, CITES accords varying degrees of protection to more than 30,000 species of animals and plants, whether they are traded as live specimens or as products.

259. CITES works by subjecting international trade in specimens of selected species to certain controls. All import, export, re-export and 'introduction from the sea' of species covered by the Convention has to be authorized through a licensing system. The species covered by CITES are listed in three Appendices, according to the degree of protection they need.

260. CITES Appendix I includes species threatened with extinction. Trade in specimens of these species is permitted only in exceptional circumstances. CITES Appendix II includes species not necessarily threatened with extinction, but in which trade must be controlled in order to avoid utilization incompatible with their survival. CITES Appendix III contains species that are protected in at least one country, which has asked other CITES Parties for assistance in controlling the trade. Changes to Appendix III follow a distinct procedure from changes to Appendices I and II, as each Party is entitled to make unilateral amendments to it.

261. CITES uses agreed biological and trade criterion to help determine whether a species should be included in Appendices I or II (CITES Resolution 9.24, 1995) These criteria include factors such as habitat decline in the assessment of a species' robustness to trade. However, CITES does not become involved directly (through the decision making body) in reducing these extra-trade impacts. CITES' role is focused specifically on the regulation of trade.

262. For cetaceans this has been consistently reinforced through CITES Resolutions where Parties have agreed that there would be no downlisting from CITES Appendix I of any cetaceans of interests to **whaling** countries, until the issues of concern for CITES (including illegal hunting, insufficient data about whale populations, insufficient monitoring enforcements proposed by the IWC) were satisfactorily addressed (CITES Resolution 2.7, 1979; CITES Resolution 2.8, 1979; CITES Resolution 2.9, 1979; CITES Resolution 3.13, 1981; CITES Resolution 9.24, 1994; CITES Resolution 11.14, 2000). Further, the CITES Parties have decided that no periodic review of any great whale should occur while the moratorium by the International Whaling Commission is in place (CITES Decision 14.81, 2010).

263. Given the implications of **climate change** for science-based decision-making, CITES Parties have directed their Animals and Plants Committees to identify the scientific aspects of the provisions of the Convention and of Resolutions of the Conference of the Parties that are actually or likely to be affected by climate change, report their findings, and make recommendations for further action (CITES Decision 15.15, 2010). The Parties also requested that the CITES Secretariat should seek to draw information from the secretariats of other multilateral environmental agreements on their activities that may be linked to climate change and CITES, and report these findings. (CITES Decision 15.15, 15.16, 2010)

264. Cetacean species currently listed on CITES Appendix I:

1. Bowhead whale (*Balaena mysticetus*)
2. Northern minke whale (*Balaenoptera acutorostrata*), except the population of West Greenland, which is included in Appendix II
3. Antarctic minke whale (*Balaenoptera bonaerensis*)
4. Sei whale (*Balaenoptera borealis*)
5. Bryde's whale (*Balaenoptera edeni*)
6. Blue whale (*Balaenoptera musculus*)
7. Omura's whale (*Balaenoptera omurai*)
8. Fin whale (*Balaenoptera physalus*)
9. Humpback whale (*Megaptera novaeangliae*)
10. Irrawaddy dolphin (*Orcaella brevirostris*)
11. Australian sub-fin dolphin (*Orcaella heinsohni*)
12. Grey whale (*Eschrichtius robustus*)
13. Baiji (*Lipotes vexillifer*)
14. Pygmy right whale (*Caperea marginata*)
15. Finless porpoise (*Neophocaena phocaenoides*)

16. Vaquita (*Phocoena sinus*)
17. Sperm whale (*Physeter macrocephalus*)
18. The right whales (*Eubalaena* spp.)
19. Beaked whales (*Berardius* spp.)
20. Bottlenose whales (*Hyperoodon* spp.)
21. Humpback dolphins (*Sousa* spp.)
22. South American River dolphins (*Sotalia* spp.)
23. South Asian river dolphins (*Platanista* spp.)

265. All Cetacea spp. are listed on CITES Appendix II, except the species included in Appendix I. A zero annual export quota has been established for live specimens of the Black Sea population of *Tursiops truncatus* removed from the wild and traded for primarily commercial purposes.

IV (c) Convention on Biological Diversity

266. The Convention on Biological Diversity (CBD) was opened for signature on 5 June 1992 at the United Nations Conference on Environment and Development (the Rio "Earth Summit"). CBD was inspired by the world community's growing commitment to sustainable development.

267. Since its first meeting in 1994, the CBD dialogue has caused a dramatic step forward in the conservation of biological diversity, the sustainable use of its components, and the fair and equitable sharing of benefits arising from the use of genetic resources. Since 2000, CBD meetings have discussed the detail of protecting critical **habitat** for marine species and protected area design, the impacts of **bycatch** and **overfishing**, the impacts of tourism, **pollution**, and especially the impacts of **climate change** (Convention on Biological Diversity, 2000, 2004, 2006, 2008, 2010).

268. However, CBD's role is to provide the direction, coordinate shared information and increasingly facilitate capacity and financing of conservation activities. CBD is not an implementing treaty and does not develop Actions Plans for species per se. The implementation role rests with Governments and other MEAs whose purpose is directed towards implementation. National Biodiversity Strategies and Action Plans (NBSAPs) are the principal instruments for implementing the Convention at the national level. For instance, Decision X/2, the tenth meeting of the Conference of the Parties calls upon countries to implement the *2011-2020 Strategic Plan for Biodiversity, including the Aichi Biodiversity Targets*, including for instance:

- a. Integration of national targets into revised and updated NBSAPs, adopted as a policy instrument
- b. Use of revised and updated NBSAPs as effective instruments for the integration of biodiversity targets into national development and poverty reduction policies and strategies, national accounting, as appropriate, economic sectors and spatial planning processes, by Government and the private sector at all levels
- c. Monitoring and review of NBSAP implementation in accordance with the Strategic Plan and national targets, making use of the set of indicators developed for the Strategic Plan as a flexible framework (Convention on Biological Diversity: Decision X/2, 2010)

269. The CBD Conference of the Parties has established seven thematic programmes of work which correspond to some of the major biomes on the planet. Marine and Coastal Biodiversity is one of these thematic programmes. Each programme establishes a vision for, and basic principles to guide future work. They also set out key issues for consideration, identify potential outputs, and suggest a timetable and means for achieving these. There are also programmes cross-cutting issues to provide bridges between the thematic programmes. Implementation of the work programmes depends on contributions from Parties, the Secretariat, relevant intergovernmental and other organizations.

270. The Subsidiary Body on Scientific, Technical and Technological Advice (SBSTTA) and the Ad Hoc Open-ended Working Group on Review of Implementation of the Convention (WGRI) provide Parties with timely advice relating to the implementation of the Convention.

IV (d) Convention on Wetlands of International Importance

271. The Convention on Wetlands of International Importance (Ramsar) is an intergovernmental treaty that provides the framework for national action and international cooperation for the conservation and wise use of wetlands and their resources. The Ramsar Convention is the only global environmental treaty that deals with a particular ecosystem. The treaty was adopted in the Iranian city of Ramsar in 1971.

272. The Convention uses a broad definition of the types of wetlands covered in its mission, including lakes and rivers, swamps and marshes, wet grasslands and peatlands, oases, estuaries, deltas and tidal flats, near-shore marine areas, mangroves and coral reefs, and human-made sites such as fish ponds, rice paddies, reservoirs and salt pans.

273. The Ramsar List of Wetlands of International Importance, according to Article 2 of the treaty text, is the keystone of the Ramsar Convention, and, in the Strategic Framework's "Vision for the List", its chief objective is to "develop and maintain an international network of wetlands which are important for the conservation of global biological diversity and for sustaining human life through the maintenance of their ecosystem components, processes and benefits/services".

274. Of the 1,953 Ramsar sites around the world, the following 14 sites have been identified in the Ramsar list as providing habitat protection to cetaceans:

- a. Irrawaddy dolphin (*Orcaella brevirostris*): Middle Stretches of the Mekong River north of Stoeng Treng (Ramsar site no. 999), Cambodia
- b. Bottlenose dolphin (*Tursiops truncatus*): Palisadoes - Port Royal (Ramsar site no. 1,454), Jamaica
- c. Bottlenose dolphin (*Tursiops truncatus*): Suakin-Gulf of Agig (Ramsar site no. 1,860), Sudan
- d. Tucuxi (*Sotalia fluviatilis*): Cayos Miskitos y Franja Costera Inmediata (Ramsar site no. 1,135), Nicaragua
- e. Chinese dolphin (*Sotalia sinensis*): Shankou Mangrove Nature Reserve (Ramsar site no. 1,153), China
- f. Number of whale and dolphin species: Dalian National Spotted Seal (*Phoca vitulina*) Nature Reserve (Ramsar site no. 1,147), China
- g. Ganges River dolphin (*Platanista gangetica gangetica*): Upper Ganga River (Brijghat to Narora Stretch) (Ramsar site no. 1,574), India
- h. Fin whale (*Balaenoptera physalus*), bottlenose dolphin (*Tursiops truncatus*) and short-beaked common dolphin (*Delphinus delphis*): Cap des Trois Fourches (Ramsar site no. 1,473), Morocco
- i. Atlantic humpback dolphin (*Sousa teuszii*): Baie d'Ad-Dakhla (Ramsar site no. 1,470), Morocco
- j. Orca (*Orcinus orca*) and dolphins: Parque Nacional Bahía de Loreto (Ramsar site no. 1,358), Mexico
- k. Bottlenose dolphin (*Tursiops truncatus*) and Humpback whale (*Megaptera novaeangliae*): Playa Barra de la Cruz (Ramsar site no. 18,21), Mexico
- l. Fin whale (*Balaenoptera physalus*), Bryde's whale (*Balaenoptera edén*), humpback whale (*Megaptera novaeangliae*) and Grey whale (*Eschrichtius robustus*): Balandra (Ramsar site no. 1,767), Mexico
- m. Pygmy killer whales (*Feresa attenuata*), False killer whales (*Pseudorca crassidens*) and the Long-finned pilot whale (*Globicephala macrorhynchus*): Cuencas y corales de la zona costera de Huatulco (Ramsar site no. 1,321), Mexico
- n. Humpback whale (*Megaptera novaeangliae*): Abrolhos Marine National Park (Ramsar site no. 1,902), Brazil (Ramsar Convention on Wetlands, 2010)

275. In addition to a solid record on cetacean habitat protection, Ramsar has also discussed the impacts of climate change on wetlands (Ramsar: Resolution VIII.3, 2002; Ramsar: Resolution VIII.32, 2002; Ramsar: Resolution IX.5, 2005; Ramsar: Resolution IX.9, 2005)

IV (e) International Maritime Organization

276. The International Maritime Organisation (IMO) is the United Nations' specialized agency responsible for developing and adopting international technical standards on the safety, security and efficiency of shipping and on the protection of the environment from any adverse impact caused by shipping operations. It is appropriate to note that almost all aspects of IMO activities relate in some way to marine and therefore cetacean conservation. The IMO International Convention for the Prevention of Pollution from Ships (MARPOL) is the instrument that regulates and prevents marine and atmospheric pollution by ships. It covers accidental and operational oil pollution as well as pollution by chemicals, goods in packaged form, sewage, garbage, air pollution and, through recently adopted amendments, the reduction of greenhouse gas emissions from ships. The Marine Environment Protection Committee (MEPC) is IMO's senior technical body on ship-generated pollution matters.

277. IMO's Intervention Convention and its Protocol affirms the right of a coastal State to take measures on the high seas to prevent, mitigate or eliminate grave and imminent danger to its coastline or related interests from pollution or threat of pollution of the sea by oil and other substances, following a maritime casualty or incident, whereas the International Convention on Oil Pollution Preparedness, Response and Co-operation (OPRC) provides a global framework for international co-operation in combating major incidents or threats of marine pollution. The Protocol on Preparedness, Response and Co-operation to Pollution Incidents by Hazardous and Noxious Substances (OPRC-HNS Protocol) covers marine pollution by hazardous and noxious substances. International civil liability and compensation schemes have also been developed by IMO to ensure

that adequate compensation is available to persons who suffer pollution damage resulting from maritime casualties or incidents involving spills of oil, bunker fuel and hazardous and noxious substances.

278. IMO also has Secretariat responsibilities for the Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter (London Convention) and its 1996 Protocol. The objective of the Convention and Protocol is to promote the effective control of all sources of marine pollution and to take all practicable steps to prevent pollution of the sea by the dumping of wastes. The London Protocol was in fact adopted to modernize and supersede the Convention. It entered into force in March 2006 and currently has 40 Parties.

279. IMO's predominant work relating to **climate change** has been towards the development and adoption of technical and operational measures limiting or reducing the emissions of greenhouse gases from international shipping. This work has been extensive over a number of years and resulted, in July 2011, in the adoption of amendments to MARPOL Annex VI introducing mandatory regulations on energy efficiency for ships. By improving energy efficiency, international shipping will reduce the combustion of fuel and, consequently, its emission of air pollutants and GHGs. The adopted measures will enter into force internationally in January 2013 and represent the first ever global and mandatory GHG-reduction regime for an industrial sector (see IMO document MEPC 62/24).

280. IMO has also become engaged in the issue of climate change from the perspective of planned operations for large-scale fertilization of the oceans using micro-nutrients - for example, iron - to sequester carbon dioxide (CO₂). Parties to the London Convention and Protocol, having considered advice from their scientific advisory bodies, urged States to use the utmost caution when considering proposals for large-scale ocean fertilization operations, advising that, given the present state of knowledge regarding ocean fertilization, such large-scale operations are currently not justified and could have negative impacts on the marine environment and human health (London Convention/ London Protocol, May 2007). In 2010, the Parties adopted an "Assessment Framework for Scientific Research Involving Ocean Fertilization", which had been developed since May 2007. This Assessment Framework guides Parties as to how proposals they receive for ocean fertilization research should be assessed and provides criteria for an initial assessment of such proposals and detailed steps for completion of an environmental assessment, including risk management and monitoring. Currently, Parties are finalizing work that would "establish a global, transparent and effective control and regulatory mechanism for ocean fertilization activities and other activities that fall within the scope of the London Convention and London Protocol and have the potential to cause harm to the marine environment".

281. In addition to the foregoing, in 2006, the Contracting Parties to the London Protocol adopted amendments to regulate CO₂ sequestration in sub-seabed geological formations. These amendments entered into force in February 2007 for all London Protocol Parties and, therefore, created a legal basis in international environmental law to regulate carbon capture and storage in sub-seabed geological formations for permanent isolation. At the same time as adopting these amendments, the Contracting Parties also adopted the "Risk Assessment and Management Framework for CO₂ Sequestration in Sub-Seabed Geological Formations". (MEPC 10/2000; MEPC 5/2001; MEPC 3/2002; MEPC 10/2002; MEPC 8/2003; MEPC 4/2004; MEPC 10/2004; MEPC 5/2005; MEPC 3/2006; MEPC 10/2006; MEPC 7/2007; MEPC 4/2008; MEPC 10/2008; MEPC 7/2009; MEPC 4/2010; MEPC 10/2010). This work is extensive.

282. The role that MEPC and IMO should play in the work on **ship strikes** was first raised at the 55th MEPC (2006) where it was agreed that IMO was the competent body to address collisions with cetaceans. During the 57th MEPC ship strikes were agreed to be included as a new high-priority item to develop a guidance document for minimizing the risk of ship strikes with cetaceans. This meeting agreed to finalize a guidance document in time for adoption at the 59th MEPC (MEPC 10/2008; MEPC 7/2009). This guidance was subsequently disseminated as a formal 'Guidance Document for Minimizing the Risk of Ship Strikes with Cetaceans' (MEPC.1/Circ.674, 2009). In 2010 a Joint IWC/ACCOBAMS workshop was held to discuss reducing the risk of collisions between vessels and cetaceans. The workshop sought to exchange, evaluate and analyse data on temporal and geographical distribution of cetaceans, shipping and reported collision incidents, with a view to: identifying priorities for mitigation in terms of species, populations and areas; and identifying ways to improve data collection and assignment of cause of death; to examine and evaluate existing mitigation approaches/regulations, identify and assess the likely efficacy of potential new ones and make recommendations for further work, including identifying mitigation measures for priority populations/areas as appropriate and methods to examine efficacy; and to develop scientific and conservation recommendations and a two-year work plan for consideration by the IWC, ACCOBAMS, IMO and others (IWC/ACCOBAMS, 2010).

283. IMO's work on addressing **pollution** is extensive. Decisions are too numerous to detail here, as every meeting of the MEPC deals with significant issues towards the reduction of pollution from shipping.

284. The Annexes to MARPOL constitute an important part of the convention's intent. Annex I: Prevention of Pollution by Oil prescribes the criteria under which oil discharge can take place. Segregated ballast tanks (SBT) are required on all new tankers of 20,000 dwt and above which must be protectively located to help protect the cargo tanks in the event of a collision or grounding and it is now mandatory for new oil tankers to

have double hulls. Annex II: Control of Pollution by Noxious Liquid Substances details the discharge criteria and measures for the control of pollution by noxious liquid substances carried in bulk. Some 250 substances have been evaluated and included in the list appended to the Convention. The discharge of their residues is allowed only to port reception facilities under certain concentrations and conditions. No discharge of residues containing noxious substances is permitted within 12 miles of the nearest land. More stringent restrictions apply to the Baltic and Black Sea areas. The marine pollution hazards of thousands of chemicals have been evaluated by the Evaluation of Hazardous Substances Working Group for levels of potential bio-accumulation; bio-degradation; acute toxicity; chronic toxicity; long-term health effects; and effects on marine wildlife and on benthic habitats Annex III: Prevention of Pollution by Harmful Substances in Packaged Form, Annex IV: Prevention of Pollution by Sewage from Ships, Annex V: Prevention of Pollution by Garbage from Ships, each detail requirements for documentation, stowage, quantity limitations and any exceptions as well as specific restrictions placed on dumping or discharge of these wastes at seas. The requirements are much stricter in a number of 'special areas' but perhaps the most important feature of Annex V is the complete ban imposed on the dumping into the sea of all forms of plastic. Annex VI: Prevention of Air Pollution from Ships sets limits on sulphur oxide and nitrogen oxide emissions from ship exhausts, prohibits deliberate emissions of ozone depleting substances and now contains provisions on energy efficiency for ships to ensure reduction in GHG emissions. (MARPOL 73/78, 1973)

285. A further International Convention on the Control of Harmful Anti-fouling Systems on Ships (AFS Convention), banning the use of harmful organotins in anti-fouling paints used on ships' hulls, came into force in 2008. The AFS Convention also establishes a mechanism to evaluate and assess other anti-fouling systems and prevent the potential future use of other harmful substances in these systems (AFS Convention, 2001).

286. IMO has engaged in a Global Initiative for West and Central Africa (GI WACAF) in partnership with the International Petroleum Industry Environmental Conservation Association (IPIECA) to strengthen the national oil spill response capability in 21 countries in West and Central Africa, through the establishment of local partnerships between the oil industry and the national authorities responsible for oil spill preparedness and response at the national level (IMO, 2011).

287. Each MEPC meeting deliberates mitigating marine chemical pollutions in detail (MEPC 10/2000; MEPC 5/2001; MEPC 3/2002; MEPC 10/2002; MEPC 8/2003; MEPC 4/2004; MEPC 10/2004; MEPC (5/2005; MEPC 3/2006; MEPC 10/2006; MEPC 7/2007; MEPC 4/2008; MEPC 10/2008; MEPC 7/2009; MEPC 4/2010; MEPC 10/2010).

288. MARPOL establishes Special Areas (**habitat and feeding ground degradation**) which, because of their oceanographical and ecological condition and owing to their sea traffic, require the adoption of special mandatory methods for the prevention of sea pollution. The IMO Assembly has also established Particularly Sensitive Sea Areas which need special protection through action by IMO because of their significance for recognized ecological or socio-economic or scientific reasons and which may be vulnerable to damage by international maritime activities. The criteria for the identification of Particularly Sensitive Sea Areas and the criteria for the designation of Special Areas are not mutually exclusive. In many cases a Particularly Sensitive Sea Area may be identified within a Special Area and vice versa. for their oceanographic and ecological condition and requires the adoption of special mandatory methods for the prevention of sea pollution. MARPOL also established Particularly Sensitive Sea Areas which need special protection through action by IMO because of their significance for recognized ecological, socio-economic or scientific reasons and which may be vulnerable to damage by international maritime activities. The criteria for the identification of Particularly Sensitive Sea Areas and the criteria for the designation of Special Areas are not mutually exclusive. In many cases a Particularly Sensitive Sea Area may be identified within a Special Area and vice versa.

Special Areas	Annex I: Oil	Mediterranean Sea Baltic Sea Black Sea "Gulfs" area Gulf of Aden Antarctic area North West European Waters Oman area of the Arabian Sea Southern South African waters
	Annex II: Noxious Liquid Substances	Antarctic area
	Annex IV: Sewage	Baltic Sea (expected to enter into force in January 2013)
	Annex V: Garbage	Mediterranean Sea Baltic Sea

		Black Sea Red Sea "Gulfs" area North Sea Antarctic area (south of latitude 60 degrees S) Wider Caribbean region, including the Gulf of Mexico and the Caribbean Sea
	Annex VI: Prevention of air pollution by ships (Emission Control Areas)	Baltic Sea (SOx) North Sea (SOx) North American (SOx and NOx) United States Caribbean Sea area (NOx, SOx and PM) (expected to enter into force in January 2013)
Particularly Sensitive Sea Areas	Great Barrier Reef, Australia (designated a PSSA in 1990) Extension of the existing Great Barrier Reef PSSA to include the Torres Strait (proposed by Australia and Papua New Guinea) (2005) Sabana-Camagüey Archipelago in Cuba (1997) Malpelo Island, Colombia (2002) Sea area around the Florida Keys, United States (2002) Wadden Sea, Denmark, Germany, Netherlands (2002) Paracas National Reserve, Peru (2003) Western European Waters (2004) Canary Islands, Spain (2005) Galapagos Archipelago, Ecuador (2005) Baltic Sea area, Denmark, Estonia, Finland, Germany, Latvia, Lithuania, Poland and Sweden (2005) Papahānaumokuākea Marine National Monument, United States (2007) Strait of Bonifacio, France and Italy (2010)	

289. The first Guidelines for the Designation of Special Areas and the Identification of Particularly Sensitive Sea Areas established by the MEPC were adopted by the IMO Assembly in 1991. The Guidelines were completely revised in 2004 and the Revised Guidelines for the Identification and Designation of Particularly Sensitive Sea Areas were adopted by the Assembly as resolution A.982(24) in 2005. These guidelines recognise that area based protection may be undertaken by a range of IMO instruments, and seek to provide the most suited measures to protect such areas that may be identified against damage, or the identified threat of damage, from international shipping activities (IMO, 2005). The guidelines also recognise a number of ecological criteria of direct relevance to the question of feeding ground and habitat, including:

- a. critical habitat as sea areas that may be essential for the survival, function, or recovery of fish stocks or rare or endangered marine species, or for the support of large marine ecosystems. (IMO 2005, in Annex at 4.4.2);
- b. dependency as area where ecological processes are highly dependent on biotically structured systems (e.g. coral reefs, kelp forests, mangrove forests, seagrass beds). Such ecosystems often have high diversity, which is dependent on the structuring organisms ... [including] the migratory routes of fish, reptiles, birds, mammals, and invertebrates (IMO 2005, in Annex at 4.4.3); and
- c. spawning or breeding grounds as areas that may be a critical spawning or breeding ground or nursery area for marine species which may spend the rest of their life-cycle elsewhere, or is recognized as migratory routes for fish, reptiles, birds, mammals, or invertebrates. (IMO 2005, in Annex at 4.4.7)

290. Protective measures for PSSAs focus on actions that are to be, or have been, approved or adopted by IMO and include the following options:

- a. designation of an area as a Special Area under MARPOL Annexes I, II, IV or V, or an Emission Control Area under MARPOL Annex VI, or application of special discharge restrictions to vessels operating in a PSSA. (IMO 2005, in Annex at 6.1.1)
- b. adoption of ships' routeing and reporting systems near or in the area, under the International Convention for the Safety of Life at Sea (SOLAS) and in accordance with the General Provisions on Ships' Routeing and the Guidelines and Criteria for Ship Reporting Systems. (IMO 2005, in Annex at 6.1.2)
- c. development and adoption of other measures aimed at protecting specific sea areas against environmental damage from ships, provided that they have an identified legal basis. (IMO 2005, in Annex at 6.1.3)

291. MEPC addresses the impacts to the Special Areas and Particularly Sensitive Sea Areas in detail, although there is little considerations of species level information at this point (MEPC 10/2000; MEPC 5/2001; MEPC 3/2002; MEPC 10/2002; MEPC 8/2003; MEPC 4/2004; MEPC 10/2004; MEPC (5/2005; MEPC 3/2006; MEPC 10/2006; MEPC 7/2007; MEPC 4/2008; MEPC 10/2008; MEPC 7/2009; MEPC 4/2010; MEPC 10/2010).

292. The 58th MEPC approved the inclusion of a new high priority item in the work programme of the Committee on "**Noise** from commercial shipping and its adverse impact on marine life". A Correspondence Group continued its work on this issue between the 59th and 61st MEPC sessions, and concluded that propeller cavitation is the main source for ship generated underwater noise. Accordingly, future research programs should focus on the propeller and the relationship between cavitation and the cause of underwater sonic energy, and the MEPC recommended non-binding, technical guidelines and consideration of solutions to reduce the incidental introduction of underwater noise from commercial shipping and, in turn, reduce potential adverse impacts to marine life. The Committee noted that issues such as "propulsion", "hull design", "onboard machinery" and "operational modifications" relate to ship design and equipment and referred the matter to the Sub-Committee on Ship Design and Equipment for advice. (MEPC 7/2009; MEPC, 4/2010; MEPC, 10/2010). In 2011, the 62nd MEPC requested the latter Sub-Committee to develop technical guidelines to address the issue, under the Committee's aegis.

IV (e) International Whaling Commission Scientific Committee and Conservation Committee

293. The International Whaling Commission Scientific Committee (IWC SC) has considered a range of threats to cetaceans in recent years. The IWC SC has regular working groups which review environmental threats and human induced mortalities, particularly bycatch and ship strikes (IWC, 2002).

294. It is probably appropriate to note that, while the IWC SC deliberations of non-whaling threats have been significant and that the IWC SC remains today one of the most important scientific forums for cetaceans, these deliberations have not always translated into policy decisions being taken during the plenary forum of the International Whaling Commission.

295. In 2003 the IWC agreed to establish a Conservation Committee to strengthen the conservation agenda of the International Whaling Commission (*Resolution 2003-1: The Berlin Initiative on Strengthening the Conservation Agenda of the International Whaling Commission*). In 2004 the IWC established and convened its first Conservation Committee meeting (IWC 2004). This meeting focused on the establishment of the Committee and endangered species and populations; human impacts (e.g. noise, vessel strike, bycatch, entanglements, strandings); habitat protection for cetacean conservation; whale watching best practice guidelines; reporting systems for strandings, entanglements and bycatch; legal and regulatory arrangements for cetacean conservation were suggested as initial items of common interest. The Conservation Committee was directed 'to explore how the Commission can co-ordinate its conservation agenda through greater collaboration with a wider range of other organisations and conventions' (IWC 2004).

296. The IWC SC has considered **bycatch** in two ways: either as a component in a review of a particular taxon that it may be considering or in the context of 'total removals over time'. This latter concept relates to theoretical removal rates for cetacean populations and that this should also take into account other losses, including bycatch. In addition to these two approaches, at the 52nd meeting, the Committee considered bycatch more broadly in the context of the threat that it poses to small cetaceans in general and made a series of recommendations (IWC, 2001), including:

- a. that information on the bycatch of cetaceans in fisheries and mariculture operations be collected, preferably using independent observers;
- b. that particular effort be devoted to developing strategies for reducing the bycatches of small cetaceans in the developing world;
- c. that if time-area restrictions are to be used as a bycatch mitigation measure, the following conditions should be met: extensive information should be available on the spatial and temporal distribution of small cetaceans, rates of bycatch, and fishing effort; proper enforcement must occur, as without it, e.g. in the case of the vaquita, any effectiveness is undermined; and a monitoring scheme must be developed and continue even after management goals appear to have been achieved; and
- d. further research to identify alternative fishing gear and methods, other than acoustic approaches, that could serve as long-term solutions to the bycatch of small cetaceans.

297. At the 54th meeting the IWC SC discussed bycatch at some length in the context of total removals from whale stocks (IWC, 2002), recommending the necessity to identify the fisheries concerned and then agreed that priority should be given to those areas where the Revised Management Procedure is likely to be implemented –

such as the northwestern Pacific and the northeastern Atlantic. The bycatch data in the progress reports submitted annually by member nations were considered in some detail at 54th IWC SC (IWC, 2003), including the minke whale bycatch in Japan and Korea. At the same meeting, the IWC SC recommended that modelling studies should be encouraged to try to estimate how much observer coverage of a particular fishery would be required to allow reliable estimates of large whale bycatch. The 57th IWC SC endorsed a series of regional workshops to address cetacean bycatches and recommended collaboration with other organisations with an interest in this matter (e.g. the Convention on Migratory Species, the Committee on Fisheries of the UN Food and Agriculture Organization, IUCN and relevant international and regional fishery organizations). In 2005, the International Whaling Commission had suggested that information from handling and release of entangled cetaceans in fishing nets and marine debris could be of relevance for the IWC SC's work.

298. Through all the years considered here, the IWC SC has reiterated its concerns about certain highly endangered small cetaceans where bycatch was a contributing factor to their unfavourable conservation status. These included the vaquita. (IWC, 2002). At the 54th IWC SC it more positively commended the establishment of a Working Group, whose mandate is to develop a general strategy for the recovery of the vaquita, and the joint efforts of conservation organizations and the Government of Mexico for their development of this strategy. The 55th IWC SC called for gillnets to be removed from the Upper Gulf of California immediately (IWC, 2008c). Cooperation with FAO was discussed in detail during the 55th and 56th IWC SC meetings (IWC, 2004; IWC, 2005) where it was noted that, in the longer term, an appropriate formal mechanism for collaboration might be through the recently established Fishery Resources Monitoring System where existing partners include regional fishery bodies and FAO. The 57th IWC SC recommended that the IWC should join the FIRMS agreement and asked the Secretary to implement this (IWC, 2006). The development of an agreed data sharing format was noted as still requiring intersessional work in 2008 (IWC, 2008c). A workshop held in 2005 concluded that market sampling is a potentially useful method to supplement bycatch reporting schemes. It also agreed that bycatch estimates from market surveys would be improved considerably if carried out in conjunction with the use of data from DNA (Deoxyribonucleic acid) registers on whales entering the market (IWC, 2006). The IWC SC work reviewing bycatch levels especially where this threat relates to the IWC Revised Management Procedure and in relation to the vaquita, continued through the 58th - 62nd meetings (IWC 2006; IWC 2007; IWC 2008; IWC 2009; IWC 2010). The IWC SC has maintained through this time that bycatch remains a high priority topic.

299. The 55th IWC SC meeting convened a special session on 'Southern Ocean **climate change** and cetaceans' with a number of invited speakers and presentations (IWC, 2004). Some discussion followed focusing on the potential linkages between krill and changes in physical parameters driven by climate change (IWC, 2006). During the 61st IWC meeting, the Commission passed a climate change resolution, acknowledging that 'climate-related changes will impact negatively on at least some species and populations, especially those with small and/or restricted ranges, those already impacted by other human activities and those in environments subject to the most rapid change For these species there is a real potential for elevated risks of extinction' (Resolution 2009-1: Consensus Resolution on Climate and Other Environmental Changes and Cetaceans) and directing the Scientific Committee to continue its work on studies of climate change and the impacts of other environmental changes on cetaceans, and well as directing the Secretariat to forward the resolution and IWC to relevant bodies and meetings including inter alia the World Climate Conference, the United Nations Framework Convention on Climate Change and the IPCC (IWC, 2009)

300. As a response to concerns about the impacts of **ship strikes**, the 53rd IWC SC recommended that data on the cause of death and the extent of the examination of stranded animals be reported in Progress Reports. The 54th IWC SC established an intersessional group was set up to look at sourcing information from high speed ferries and IWC SC reiterated its request last year that necropsies on stranded animals should examine animals as thoroughly as possible for evidence of ship strikes. The meeting recommended that it is a matter of 'absolute urgency' that every effort be made to reduce anthropogenic mortality in the population of North Atlantic right whales to zero. It reviewed mortality caused by ship strikes and entanglement, noted the low reproductive rate of the population and reiterated the concerns and recommendations made in the previous year. The 2006 meeting considered the recent ACCOBAMS workshop on this issue and endorsed its recommendation related to estimating the number of ship strikes which included (IWC, 2007). Further collaboration between IWC and ACCOBAMS was also recommended.

301. The 59th IWC SC meeting responded to the Commission's request for more information on entanglement, and reviewed the use of data gathered by release programmes in improving estimates of the magnitude, rate and geographic extent of entanglements; the impact of entanglements on whales, focusing on the potential, through available case studies and/or modelling, to estimate mortality rates and other non-lethal impacts, including both individual and population level affects; methods of safely collecting appropriate data while releasing different species, practical experiences of disentanglement techniques and relative success rates; the types of data which can be collected from entangled/entrapped whales; and uses of similar or related data that can complement data collected from entangled/released whales. The IWC SC emphasized that the most valuable use of disentanglement data was for developing new fishing gear and practices that prevent lethal entanglements of large whales (IWC, 2008a).

302. During the 57th IWC meeting the Conservation Committee agreed to discuss ship strikes at its next meeting (IWC, 2005). The 58th meeting of the Conservation Committee the Ship Strikes Working Group (SSWG) identified four technical mitigation measures (detection and avoidance manoeuvres, repulsion, protection and training) and indicated that a combination of these is necessary to mitigate ship strikes.

303. The 59th and 60th IWC Conservation Committee agreed to maintain the same programme of work (IWC, 2007; IWC, 2008) and endorse four major recommendations of the SSWG to the Conservation Committee.

- a. The SSWG endorses the recommendations of the Scientific Committee for future work, including that the Secretariat develop and maintain the ship strikes database and integrate it in the IWC website.
- b. The Conservation Committee should request Contracting Governments to use the agreed ship strike template and submit ship strikes data to the IWC Secretariat on a regular basis.
- c. The Conservation Committee should request Contracting Governments to communicate ship strikes data and information to relevant maritime sector bodies, including port authorities, shipping federations, coast guards and other relevant bodies.
- d. A Steering Committee for a multidisciplinary workshop on ship strike mitigation should be established, noting that workshop participants should represent experts from within the Commission, the Scientific Committee and appropriate other organizations.

304. The IWC SC and CC work reviewing ship strike levels continues through the most recent period, of the 61st and 62nd meetings (IWC 2009; IWC 2010).

305. The IWC SC has a programme of work known as POLLUTION 2000+ which is intended to investigate the impacts of chemical **pollution** on cetaceans. The IWC SC reviews the progress of this work and strongly encourages the IWC member nations to contribute to this research programme. In due course the IWC SC received and reviewed the final report of Phase I (IWC, 2007). The outputs of POLLUTION 2000+ included the publication of *Journal of Cetacean Research and Management, Special Issue 1, Chemical Pollutants and Cetaceans*, publications in peer reviewed scientific journals and presentations at international conferences and workshops. The IWC SC also decided that an interdisciplinary workshop should be held to identify the need for a possible Phase II, and if appropriate, design an outline research proposal for the programme's continuation. This workshop reported to the 2007 meeting and the Committee then recommended that Phase II of the programme should begin as outlined in the workshop report (IWC, 2008a). The initial work proposed would concentrate on developing:

- a. an integrated modelling framework for examining the effects of pollutants on cetacean populations; and
- b. a protocol for validating the use biopsy samples in pollution related studies.

306. During the 52nd IWC SC, the threat from pollution to riverine dolphins was highlighted in the review made of these taxa (IWC, 2001). The 57th IWC SC made a special review of the situation of the finless porpoise, *Neophocaena phocaenoides*, worldwide and along with other recommendations it encouraged further work to assess the potential impacts of contaminants and other anthropogenic influences on this species in all parts of its range (IWC, 2006). Pollution remains a high priority issue for the IWC SC and has continued through the 58th - 62nd meetings (IWC 2006; IWC 2007; IWC 2008; IWC 2009; IWC 2010).

307. In so far as IWC Scientific Committee and Conservation Council address **habitat and feeding ground degradation**, an annual State of the Cetacean Report (SOCER) has been produced since the 52nd IWC SC meeting. SOCER focuses on particular regions for each annual edition. The Small Cetaceans Sub-Committee of the 52nd IWC SC focused its work on river dolphins (IWC, 2001). This review generated a series of recommendations which included *inter alia* studying habitat parameters and loss further (for example environment quality and carrying capacity). An IWC Workshop on Habitat Degradation was held at the University of Siena, 12-15 November 2004. The workshop had developed a framework for a long-term approach to investigating the significance of habitat degradation for cetaceans. In order to facilitate the development of this process, the Workshop agreed that the primary focus should be on populations for which it was believed there was the most chance of success (i.e. those for which good information is available on both cetaceans and their habitat over a reasonable time period), although the Workshop also recognized that overall there are few cetacean populations studied with broad sampling programmes covering sufficiently long time frames. The Workshop also stressed the value of long-term monitoring of both cetaceans and key aspects of their habitat to provide baseline data. It also noted that spatial modelling approaches are particularly valuable in integrating data on cetacean distribution and abundance with data on their habitat and the need to better understand the feeding and reproductive behaviour of cetaceans. The Workshop strongly recommended that effort be put into further consideration of the framework including:

- a. linking of the different types of models, e.g. through data on vital rates;

- b. developing ways to model how stressors affect features of the habitat or individuals directly; and
- c. developing ways in which spatial modelling approaches can better incorporate dynamic variables.

308. During the 55th IWC SC a review was made of the situation of small cetaceans in the Black Sea. The Committee made numerous research and management recommendations, including the need for systematic surveys of the three species concerned and better information on removal rates (IWC, 2004). The situation of the Ganges river dolphin was highlighted during the 56th IWC SC (IWC 2005). The Committee took note of a proposed plan by the government of India to construct a large number of canals and dams to transfer water from Himalayan to Peninsular Rivers. This would create barriers within the Ganges dolphin's known or suspected historical range and the Committee expressed concern over the effects of the proposed project and recommended a full assessment of the effects of this project on the Ganges dolphins and other small cetaceans. An IWC Workshop entitled 'High Latitude Sea Ice Environments: Effects on Cetacean Abundance, Distribution and Ecology' was held in Ulsan, South Korea from 28-29 May 2005. It reviewed information on sea ice environments in the Arctic and Antarctic, and to develop means of incorporating sea ice and similar data into analyses and models used by the Scientific Committee in its work (IWC 2005). During the 2008 IWC SC the situation of small cetaceans in the southeast Pacific was reviewed (IWC, 2008c). The rapid expansion of aquaculture in the region was noted and the Committee expressed its concern about associated habitat degradation and the exclusion of small cetaceans from their habitat. The IWC SC has a long-standing programme of work in Antarctica. This research includes ongoing work on minke whale population sizes and more recently a focus on investigating the whales' habitat, especially their relationship to the ice-edge. Whilst the primary context to this is to determine how it may affect population estimates, the relationship between baleen whales and the ice-edge is an important issue in terms of habitat changes.

309. The annual reports from the Committee show that over the years, the IWC has expanded its collaborative research in the Antarctic and this now includes collaboration with the Convention on Antarctic Marine Living Resources (CCAMLR), the Southern Ocean Global Ecosystem Dynamics Program (SO-GLOBEC), the US National Science Foundation (NSF) and the Australian Southern Ocean Cetacean Ecosystem Program (SOCEP). The 53rd IWC SC considered in some detail the situation of the Western North Pacific gray whales, noting that they are isolated from eastern gray whales, remain highly depleted and show no apparent signs of recovering. The Committee strongly recommended that no seismic work should be conducted while whales are present in the region. It also commented that all future monitoring and mitigation plans for seismic surveys and other activities related to Sakhalin oil and gas development need to be reviewed by experts not funded directly by industry (IWC, 2002). In 2004 the IWC SC again looked at the situation of the western gray whales and the topics discussed included stock identity, migration, distribution, catch history, population estimates, biological parameters, habitat-related problems, population assessment, existing research programmes and objectives for future research. The conclusions of previous reviews were reaffirmed, that:

- a. the population is very small, suffers from a low number of reproductive females, low calf survival, male-biased sex ratio, dependence upon a restricted feeding area, and apparent nutritional stress (as reflected in a large number of skinny whales);
- b. other major potential concerns include reactions to noise (notably in light of increasing industrial activity in the area) and the threat of an oil spill off Sakhalin which could potentially exclude animals from this feeding ground; and
- c. assessments of the potential impact of any single threat to the survival and reproduction of western gray whales were insufficient. (IWC, 2004).

310. Concerns continued to be repeated through the following years as developments progressed. For example, the 2007 meeting noted with concern that 4D seismic survey was due to be conducted in the summer 2008 near the feeding ground of endangered western gray whales off Sakhalin Island (IWC, 2008; IWC 2009; IWC 2010).

311. The IWC SC has been concerned with the issue of marine **noise** and cetaceans since at least 2004. Issues such as the rapid development of marine wind farms as well as deliberate deployment of powerful acoustic sources have been considered (IWC, 2004). The Committee in 2004 endorsed a series of recommendations calling for research into anthropogenic noise, including the need to further review and study strandings and requested that these recommendations be transmitted to representatives of geophysical exploration and petroleum industries, and various committees and agencies (e.g. ASCOBANS, ACCOBAMS, JNCC, MMCC, NOAA-NMFS, NRC, IUCN, ICES, OSPAR) and also to relevant forthcoming workshops (IWC, 2005).

312. With respect to military sonars the 2004 meeting endorsed the following recommendations:

- a. a full review of typical and atypical strandings, including beaked whales and other species that stranded at the same time;
- b. a full analysis of stranding data relative to military activities;
- c. thorough, standardized *post mortems* of entire animals at mass strandings;

- d. standardized responses and protocols for documenting and understanding mass stranding events;
- e. an investigation of the correlation of natural sounds (e.g. earthquakes, typhoons) with the mass strandings of beaked whales; and
- f. surveys for Cuvier's beaked whales off the Pacific coast of Japan where these whales were hunted and have stranded in masses.

313. During the 58th IWC SC beaked whale strandings associated 'temporally and spatially' with naval exercises were reviewed (IWC, 2007). Associated events occurred in the Canary Islands in 2002 and 2004 and in Almeria (Spanish coast) in 2006. The pathology conducted on animals from all these events showed 'gas and fat emboli syndrome'. In 2007, the IWC SC reviewed its work on acoustic topics and noted a planned joint naval exercise between Australia and the USA where mid-frequency naval sonar was planned to be used (IWC, 2008). The Committee urged that its previous recommendations from 2004 (IWC, 2005) should be followed by other Governments planning for naval exercises in 2007.

314. The IWC SC has expressed great concern over the critically endangered western gray whale on a number of occasions. This is one of the most endangered populations of large whales in the world with a population size of around 130 individuals but only about 23 breeding females. The primary feeding grounds lie along the north-eastern coast of Sakhalin Island, where existing and planned oil and gas developments pose potentially serious threats to the population through habitat damage, ship strikes, noise pollution and oil spills (IWC 2010).

IV (g) United Nations Environment Programme - Regional Seas Programme

315. The United Nations Environment Programme - Regional Seas Programme aims to address the accelerating degradation of the world's oceans and coastal areas through the sustainable management and use of the marine and coastal environment, by engaging neighbouring countries in comprehensive and specific actions to protect their shared marine environment.

316. There are six UNEP administered Regional Seas Programmes including the Wider Caribbean Region, East Asian Seas, Eastern Africa Region, Mediterranean Region, North-West Pacific Region and the Western Africa Region

317. There are a further seven non-UNEP Administered Regional Seas Programmes including the Black Sea Region, North-East Pacific Region, Red Sea and Gulf of Aden, ROPME Sea Area, South Asian Seas, South-East Pacific Region and the Pacific Islands Region.

318. There are an additional five independent regional seas programmes, including the Arctic Region - Arctic Environmental Protection Strategy (AEPS), Antarctic Region - Convention on the Conservation of Antarctic Marine living Resources (CCAMLR), Baltic Sea - Convention on the Protection of the Marine Environment of the Baltic Sea Area (Helsinki Convention), Caspian Sea - Caspian Environment Programme, North-East Atlantic Region - Convention for the Protection of the Marine Environment of the North-East Atlantic (OSPAR Convention). Of this last independent group, only the OSPAR Convention has been reviewed as it was specifically listed in Resolution 8.22

Wider Caribbean Regional Seas

319. The Convention for the Protection and Development of the Marine Environment in the Wider Caribbean Region (Cartagena Convention) was adopted in 1983 as a framework agreement for the protection and development of the marine environment (Cartagena Convention, 1983). The Convention is supported by an Action Plan for the Caribbean Environment Programme, a Marine Mammal Action Plan and a series of specific and focused Protocols: the Protocol Concerning Co-operation in Combating Oil Spills in the Wider Caribbean Region which entered into force in 1986 (Oil Spills Protocol, 1983); the Protocol Concerning Specially Protected Areas and Wildlife (SPA) in the Wider Caribbean Region which entered into force in 2000 (SPA Protocol, 1990); and the Protocol Concerning Pollution from Land-Based Sources and Activities which entered into force in 2010 (LBS Protocol, 1999). Although the Contracting Parties designated the UNEP Caribbean Regional Coordinating Unit as the Secretariat of the Cartagena Convention, Contracting Parties may use Regional Activity Centres for the coordination and implementation of activities in support of the Cartagena Convention and its Protocols and Regional Activity Networks for the provision of expertise.

320. The objective of the SPAW Protocol is to protect rare and fragile ecosystems and habitats, thereby protecting the endangered and threatened species within the region, utilizing an ecosystem approach to conservation. All species of cetaceans known to be within the SPAW region are listed on Annex II of the Protocol, which provides that each Party should ensure total protection and recovery to the species of the listed species by prohibiting the taking, possession or killing (including, to the extent possible, the incidental taking, possession or killing) or commercial trade in such species, their eggs, parts or products (which covers **hunting, live capture and bycatch** for the purposes of this review); and to the extent possible, the disturbance of such species, particularly during periods of breeding, incubation, aestivation or migration, as well as other periods of biological stress (which covers **habitat and feeding grounds** for the purposes of this review).

321. Articles 11 and 21 of the SPAW Protocol call for the development and implementation of programmes for protected species, as well as guidelines and criteria for the management of protected species, including migratory species. Article 14 recognizes traditional use to satisfy cultural and subsistence needs. Annex II of the SPAW Protocol lists all species of marine mammals of the Wider Caribbean Region as threatened and endangered (SPAW Protocol, 2000)

322. Through a cohesive combination of activities directed through the Action Plan for the Caribbean Environment Programme, the SPAW Protocol and the LBS Protocol, the Cartagena Convention has developed a solid programme of work directly addressing bycatch, live capture, hunting, the impacts of **pollution**, the impacts of **noise, ship strikes, the impact of climate change** and habitat and feeding grounds protection through marine protected areas, consistently directed towards marine mammals and in many cases cetaceans specifically (Convention for the Protection and Development of the Marine Environment of the Wider Caribbean Region, 2000, 2002, 2004, 2006, 2008, 2010; SPAW Protocol, 2000, 2002, 2004, 2006, 2008, 2010; LBS Protocol, 2010)

East Asian Seas Regional Seas

323. There is no regional convention for East Asian Regional Seas Programme. The programme promotes compliance with existing environmental treaties and is based on member country goodwill.

324. The Action Plan for the Protection and Development of the Marine Environment and Coastal Areas of the East Asian Seas Region (the East Asian Seas Action Plan) was approved in 1981 stimulated by concerns over the effects and sources of marine pollution. Initially, the action plan involved five countries (Indonesia, Malaysia, Philippines, Singapore and Thailand). In 1994, it was revised to involve another five countries (Australia, Cambodia, People's Republic of China, Republic of Korea and Vietnam). The main components of East Asian Seas Action Plan are assessment of the effects of human activities on the marine environment, control of coastal pollution, protection of mangroves, sea grasses and coral reefs, and waste management. East Asian Seas Action Plan is steered by the Coordinating Body on the Seas of East Asia (COBSEA) consisting of the ten member countries (COBSEA Secretariat, 2008b)

325. In 2008 COBSEA undertook a new strategic direction, focusing on the thematic areas of:

- a. Marine- and land based **pollution**;
- b. Coastal and marine **habitat conservation**; and
- c. Management and response to coastal disasters. (COBSEA Secretariat, 2008)

326. Marine litter in the form of abandoned fishing gear ('ghost nets') and the **entanglement** of marine mammals are two of the foremost areas for consideration, and there is an established programme of work for reducing marine litter throughout the region.

327. Of note is that one of COBSEA's new strategic direction activities is to support national capacities in strengthening the implementation of relevant Multilateral Environmental Agreements (MEAs) and other international agreements and obligations (COBSEA Secretariat 2008b).

Eastern Africa Regional Seas

328. The Convention for the Protection, Management and Development of the Marine and Coastal Environment of the Eastern African Region (Nairobi Convention) and its two protocols (Protected Areas and Wild Fauna and Flora in the Eastern African Region and Cooperation in Combating Marine Pollution in Cases of Emergency in the Eastern African Region) entered into force in May 1996. The Convention was amended in 2010. The Nairobi Convention's primary focus is on reducing the impact of **pollution** and on the protection of endangered species and **habitats**. There has been some limited consideration of marine mammal conservation, but the Convention has focused thus far on other marine species in greater detail. (Nairobi Convention 1985, 2004, 2007, 2010, 2010b)

Mediterranean Regional Seas

329. In 1975, 16 Mediterranean countries and the European Community adopted the Mediterranean Action Plan, the first-ever Regional Seas Programme under UNEP's umbrella. In 1976 these Parties adopted the Convention for the Protection of the Mediterranean Sea Against Pollution (Barcelona Convention). Although the Mediterranean Action Plan's initial focus was aimed at marine pollution control, over the years, its mandate has gradually widened to include integrated coastal zone planning and management. In 1995, the Action Plan for the Protection of the Marine Environment and the Sustainable Development of the Coastal Areas of the Mediterranean (Mediterranean Action Plan Phase II) was adopted by the Contracting Parties to replace the Mediterranean Action Plan of 1975. At the same time, the Contracting Parties adopted an amended version of the Barcelona Convention of 1976, renamed Convention for the Protection of the Marine Environment and the Coastal Region of the Mediterranean.

330. The Barcelona Convention has given rise to seven Protocols addressing specific aspects of Mediterranean environmental conservation. Six of these seven address various aspects of **pollution**. The Special

Protected Areas Biodiversity Protocol commits the Contracting Parties to support actions to protect and enhance natural and cultural heritage, in particular to promote the establishment and preservation of Specially Protected Areas (**habitat and feeding ground protection**) and to incorporate the conservation of biological diversity into their national policies (Barcelona Convention, 1994, 1995, 1995b, 1995c, 1996, 1996, 2002, 2008)

331. Seven regional Action Plans have been adopted within the Mediterranean Action Plan context. Six of these directly concern species conservation for the most threatened and most emblematic species in the Mediterranean. These are being implemented by the Specially Protected Areas Regional Activity Centre. They concern the conservation of threatened species in the Mediterranean: Cetaceans, marine turtles -in particular the green turtle (*Chelonia mydas*), marine vegetation, cartilaginous fish - such as sharks, marine bird species, as well as an Action Plan on the introduction of non-indigenous species, to regulate the intentional or accidental introduction of non-indigenous or genetically-modified species to the wild and prohibit those that may have harmful impacts on ecosystems, habitats or species.

332. An Action Plan for the Conservation of Cetaceans in the Mediterranean Sea, adopted in 1991, seeks to:

- a. Protect and conserve cetacean habitats including feeding, breeding and calving grounds, without however, being restricted to these aspects.
- b. Protect, conserve and recover cetacean populations in the Mediterranean Sea Area by specifically addressing:
 - i. prohibition of deliberate taking;
 - ii. prevention and elimination of pollution;
 - iii. elimination of incidental catches in fishing gear;
 - iv. prevention of over-exploitation of fishery resources;
 - v. protection of feeding, breeding and calving grounds (Barcelona Convention, 1995c)

333. A close working relationship exists between the Mediterranean Action Plan and ACCOBAMS.

Northwest Pacific Regional Seas

334. The Action Plan for the Protection, Management and Development of the Marine and Coastal Environment of the Northwest Pacific Region (NOWPAP) was adopted in September 1994 as a part of the UNEP Regional Seas Programme. Implementation of NOWPAP contributes to the Global Programme of Action for the Protection of the Marine Environment from Land-based Activities (GPA) in the Northwest Pacific region. The overall goal of the Northwest Pacific Action Plan is "the wise use, development and management of the marine and coastal environment so as to obtain the utmost long-term benefits for the human populations of the region, while securing the region's sustainability for future generations". At the Sixth Intergovernmental Meeting, the NOWPAP Members agreed to establish a co-hosted NOWPAP Regional Coordinating Unit in Toyama, Japan, and in Busan, Republic of Korea. The Regional Coordinating Unit has overall responsibility for the implementation of the NOWPAP Members' decisions regarding the operation of the Action Plan, and maintains close contacts with and supports the work of the Regional Activity Centres, as well as establishing cooperative relationships with other international organizations.

335. NOWPAP's primary focus is on mitigating marine **pollution**, although in 2005 a new initiative was commenced on Regional and National Reports on Marine Biodiversity Data and Information (NOWPAP, 2007b) and there is commitment to renew this work with a view to exploring a regional marine protected areas network (**habitat and feeding ground protection**) (NOWPAP 2005, 2006, 2007, 2007b, 2008, 2009 2010).

Western Africa Regional Seas

336. The Convention for Co-operation in the Protection and Development of the Marine and Coastal Environment of the West and Central African Region (Abidjan Convention) was adopted in 1981. The Convention and its protocol concerning cooperating in combating **pollution** in cases of emergency came into force in 1984. To date the Convention covers the marine environment, coastal zones and related inland waters falling within the jurisdiction of the States of the Western African Region, from Mauritania to South Africa, although limited resources are hampering this Regional Seas Programme Abidjan Convention (2000, 2002, 2005, 2007, 2008, 2011).

337. After a recent period of strategic assessment and revitalization, and "*Fully aware of the urgent need to address the various land-based sources and activities resulting in substantial pollution and destruction and alteration of habitats and the coastal and marine environment of the region*" the latest meeting of the Abidjan Convention has approved the work programme for 2012–2015 that includes;

- a. Assessment of goods and services provided by the coastal and marine ecosystems and habitats;
- b. Management aimed at implementation of programmes and activities that seek to reduce or prevent degradation of the coastal and marine environment;

- c. Coordination and legal aspects, including the review and updating of the Abidjan Convention and its related protocols, improving coordination of activities and information exchange, and institutional strengthening for the implementation of the Convention;

338. In addition, they agreed to build capacity for oil spill preventions, and strengthening institutional linkages and cooperation with Large Marine Ecosystem Institutions and/or Programmes (Abidjan Convention, 2011).

Black Sea Regional Seas

339. Specific features of the Black Sea make it very vulnerable to disturbances of its environment and ecosystems. Eutrophication, **pollution**, and destructive fishing have resulted in an overall decline of diversity of species and landscapes, bringing its ecosystems to the edge of collapse. The huge increase in the volume of oil being transported across the Black Sea and oil/gas extraction from beneath the Sea itself have greatly increased the risk of oil pollution. High contamination levels of some pesticides, heavy metals and PCBs are also present at specific sites in the Black Sea, with illegal dumping/discharges (particularly of agrochemicals) being recognized as a particular problem. The Plan also considers the problem of the introduction of alien species and inadequate resources management.

340. The Convention on the Protection of the Black Sea against Pollution (Bucharest Convention) was adopted in 1992. The Black Sea Environment Programme was established in 1993 and the Strategic Action Plan for the Rehabilitation and Protection of the Black Sea first adopted in 1996, with the latest version adopted in 2009 (Commission on the Protection of the Black Sea Against Pollution, 2009; Bucharest Convention, 2009). The Black Sea Biodiversity and Landscape Conservation Protocol to the Bucharest Convention and the Protocol on the Protection of the Marine Environment of the Black Sea from Land-Based Sources and Activities have been developed but are not yet in force. (Bucharest Convention, 2002).

341. A Memorandum of Understanding exists between the ACCOBAMS and Black Sea Commission Secretariats which articulates an acknowledgment that the ACCOBAMS' Conservation Plan and the Strategic Action Plan for the Rehabilitation and the Protection of Black Sea present a set of converging goals on marine mammal conservation, confirming the potential synergies between the two Plans. An ACCOBAMS Sub-regional Coordination Unit for the Black Sea (BSSRCU) has been established within the Black Sea Commission Permanent Secretariat, and it has been agreed that in consultation with the Scientific Committee and the Permanent Secretariat of the Agreement, the BSSRCU:

- a. will facilitate the preparation of a series of international reviews or publications, to be updated regularly including:
 - i. reports on the status and trends of populations, as well as gaps in scientific knowledge;
 - ii. a sub-regional directory of important areas for cetaceans;
 - iii. a sub-regional directory of national authorities, research and rescue centres, scientists and non-governmental organisations concerned with cetaceans.
- b. will cooperate with ACCOBAMS to prepare guidelines dealing with:
 - i. the reduction or elimination, as far as possible of adverse human/cetacean interactions;
 - ii. **habitats protection** and natural resources management methods as they relate to cetaceans;
 - iii. emergency in case of massive **stranding**, major **pollution** event or **epizootics**;
 - iv. **rescue** methods for wounded or sick animals (ACCOBAMS/Black Sea Commission, 2002)

North-East Pacific Regional Seas

342. In February 2002, the Convention for Cooperation in the Protection and Sustainable Development of the Marine and Coastal Environment of the North-East Pacific (Antigua Convention) was signed. The governments also approved the Plan of Action for the Protection and Sustainable Development of the Marine and Coastal Areas of the North-East Pacific addressing issues of sewage and other **pollution**; physical alteration and destruction of coastal ecosystems and habitats (**habitat and feeding ground degradation**); **overfishing**; and the effects of eutrophication (Antigua Convention, 2002, 2002b)

Red Sea and Gulf of Aden Regional Seas

343. The Action Plan for the Red Sea and Gulf of Aden was established in 1982 and later revised in 1995 and again in 2005. In addition, member states adopted the Regional Convention for the Conservation of the Red Sea and Gulf of Aden Environment (Jeddah Convention) and the attached Protocol concerning Regional Cooperation in Combating **Pollution** by Oil and other Harmful Substances in Cases of Emergency in 1982. Two additional protocols were adopted in 2005. The first concerns the protection from land-based activities,

and the second the conservation of marine biodiversity by establishing a regional network of protected areas. More recently another protocol concerning facilitation of movement of personnel and equipment during emergency was adopted in 2009. The Regional Organization for the Conservation of the Environment of the Red Sea and Gulf of Aden (PERSGA), established in September 1995, is the coordinating body and is involved in the implementation of the Regional Convention and Protocols, and the Jeddah Action Plan the major focus of which is marine pollution (Jeddah Convention, 1982, 1982b).

344. Rapid development, particularly resulting from oil reserves, shipping, tourism and industry have caused an unprecedented surge in coastal development where a range of threats to the natural environment have emerged. In 1995, as a response PERSGA formulated and additional Protocol Concerning the Conservation of Biological Diversity and the Establishment of Network of Protected Areas in the Red Sea and Gulf of Aden. A Regional Master Plan forms a regionally-agreed framework for the planning and management of each MPA in the regional network (Jeddah Convention, 1982, 1982b, 2005).

ROPME Regional Seas

345. In April 1978, the eight Governments of the Region adopted the Kuwait Convention and Action Plan, making this one of the first Regional Seas. The Action Plan mainly covers programme activities relating to oil **pollution**, industrial wastes, sewage and marine resources, although projects range over coastal area management, fisheries and biodiversity. In 1979 of the Regional Organization for the Protection of the Marine Environment (ROPME) was created, followed by the adoption of four protocols addressing marine emergencies, hazardous wastes, land-based activities and sea-based pollution (Kuwait Convention, 1978, 1978b, 1989, 1990, 1998).

346. Responding to incidents of mass mortality of marine mammals in this Region, ROPME commissioned a fact-finding mission and expert meeting in cooperation with IUCN and a final draft of Plan of Action on Mortality of Marine Mammals was prepared. A framework of National **Stranding** Network will be developed by each Member State (ROPME, 2010).

South Asian Regional Seas

347. The Action Plan for the South Asian Regional Seas Programme was formally adopted at a Meeting of Plenipotentiaries of the concerned countries held in New Delhi, on 24 March 1995. The South Asian Seas' priorities changed significantly with the December 2004 tsunami and presently the development of strategies to cope with natural disasters is the major area of focus. The impact of **climate change** and the specific risks to the Republic of Maldives is also a priority. The Action Plan focus on Integrated Coastal Zone Management, National and Regional Oil and Chemical Spill Contingency Planning, and reducing other forms of **pollution**. (South Asia Co-operative Environment Programme, 1995)

South-East Pacific Regional Seas

348. The South-East Pacific Action Plan was adopted in 1981 together with the Convention for the Protection of the Marine Environment and Coastal Zones of the South-East Pacific (Lima Convention) and its associated protocols developed on Regional Cooperation in Combating Pollution in the South East Pacific by Hydrocarbons and other Harmful Substances in cases of Emergency; Protocol for the Protection of the South East Pacific Against Pollution from Land- Based Sources; Protocol for the Conservation and Management of Protected Marine and Coastal Areas of the South East Pacific; and Protocol for the Protection of the South East Pacific from Radioactive Pollution (Lima Convention, 1981, 1983, 1989, 1989b, 1992)

349. The overall Action Plan focuses on developing transboundary pollution monitoring and control programmes; the protection of threatened species, including marine mammals and turtles; the prevention of the introduction of alien invasive species; and to pursue a strong programme of public education and awareness.

350. A specific Plan of Action for the Conservation of Marine Mammals of the Eastern Pacific focuses on mitigation measures to address bycatch, pollution, the loss or degradation of habitat and hunting for human consumption or for use as bait in various fisheries, and the region is engaged in a significant programme of work to both map and protect habitats and also to address these threats. (La Comisión Permanente del Pacífico Sur, 2000, 2004, 2004b, 2006)

Pacific Islands Regional Seas

351. The Secretariat of the Pacific Regional Environment Programme (SPREP) is the primary regional organization concerned with environmental management and sustainable development in the Pacific and serves as the Secretariat for two Conventions: the 1986 Convention for the Protection of the Natural Resources and Environment of the South Pacific region (the Noumea Convention) entered into force in 1990. It has two Protocols and the 1995 Convention to Ban the Importation into Forum Island Countries of Hazardous and Radioactive Wastes and to Control the Transboundary Movement and Management of Hazardous Wastes within the South Pacific Region (the Waigani Convention) entered into force in 2001 (Noumea Convention, 1986; Waigani Convention, 1995)

352. SPREP has a long standing Pacific Islands Regional Marine Species Programme (currently for the period 2008-2012) and a well established Whale and Dolphin Action Plan, which is now shared with the CMS Pacific Cetaceans MOU. The Whale and Dolphin Action Plan seeks to comprehensively address entanglement and **bycatch, ship strikes**, strandings, **pollution, noise, habitat and feeding ground degradation** and the impacts of **climate change** (Noumea Convention, 1986; SPREP, 2007, 2007b)

North-East Atlantic Region/OSPAR

353. OSPAR is the mechanism by which fifteen Governments of the western coasts and catchments of Europe, together with the European Union, cooperate to protect the marine environment of the North-East Atlantic. It started in 1972 with the Oslo Convention against dumping. It was broadened to cover land-based sources and the offshore industry by the Paris Convention of 1974. These two conventions were unified, updated and extended by the 1992 OSPAR Convention. The new annex on biodiversity and ecosystems was adopted in 1998 to cover non-polluting human activities that can adversely affect the sea.

354. OSPAR has historically recognized that the **bycatch** levels of harbour porpoises within the OSPAR Regions II, III and IV are unsustainable, and that **whaling** activities in the OSPAR area is managed through the North Atlantic Marine Mammal Commission (NAMMCO) and the IWC (OSPAR, 2000). Some controls have established to address cetacean bycatch and from 1 January 2002, there was a ban on using drift nets to catch tuna and other species (OSPAR, 2000).

355. As early as 1996, the OSPAR Heads of Delegation discussed mitigation and strategies for adaptation to **climate change**, considering that climate change issues could be linked into OSPAR work and its monitoring assessments. The OSPAR Commission took decisive action towards reducing the negative effects of climate change at the 2007 Commission meeting by adopting amendments to the Annexes to the Convention to allow the storage of carbon dioxide in geological formations under the seabed. The Commission has also banned the placement of CO₂ into the water-column of the sea and on the seabed, because of the potential negative effects.

356. OSPAR has taken extensive and firm measures to reduce **pollution** within the OSPAR area. The Convention works to prevent and eliminate pollution from offshore sources and to protect the OSPAR maritime area against the adverse effects of offshore activities so as to safeguard human health and conserve the marine ecosystems. When practical, impacted marine areas are restored. A sequence of detailed decisions by OSPAR Parties regulates offshore installations, discharges, offshore chemicals, eutrophication, the control of hazardous substance and of radioactive substances. OSPAR also monitors the development of offshore installations and maintains an updated inventory of all oil and gas offshore installations in the OSPAR area, the OSPAR Oil and Gas Offshore inventory. At present more than 1,200 offshore installations are operational in the OSPAR maritime area.

357. The OSPAR Convention was expanded in 1998 to incorporate the protection and conservation of ecosystems and biological diversity (**habitats and feeding grounds**) (OSPAR, 2000). In 2003 OSPAR agreed to establish an ecologically coherent network of well-managed marine protected areas throughout the OSPAR Area (Recommendation 2003/3). A significant number of species and habitats have been the focus of this work. This decision was reaffirmed in 2010 (Recommendation 2010/2). At present there are four cetacean species on the OSPAR List of Threatened and/or Declining Species and Habitats with the bowhead whale (*Balaena mysticetus*), blue whale (*Balaenoptera musculus*) and northern right whale (*Eubalaena glacialis*) listed for wherever they occur inside the OSPAR area, and the harbour porpoise (*Phocoena phocoena*) listed for OSPAR regions II and III.

IV (h) Bern Convention on the Conservation of European Wildlife and Natural Habitats

358. The Bern Convention on the Conservation of European Wildlife and Natural Habitats (Bern Convention) covers most of the natural heritage of the European continent and extends to some States of Africa. Its aims are to conserve wild flora and fauna and their natural habitats (**habitat and feeding ground degradation**) and to promote European co-operation in that field. The Bern Convention places a particular importance on the need to protect endangered natural habitats and endangered vulnerable species, including migratory species.

359. All countries that have signed the Bern Convention must take action to promote national policies for the conservation of wild flora and fauna, and their natural habitats; ensure that planning and development policies, and measures against **pollution** with the conserve wild flora and fauna; and also to cooperate to enhance the effectiveness of these measures through co-ordination of efforts to protect migratory species;

360. The Emerald Network is an ecological network made up of 'areas of special conservation interest', which was launched by the Council of Europe as part of its work under the Bern Convention. It involves all the European Union states, some non-Union states and a number of African states (Tunisia, Morocco, Senegal and Burkina Faso are Contracting Parties; Algeria, Cape Verde and Mauritania have been invited to accede). The European Union, as such, is also a Contracting Party to the Bern Convention. In order to fulfil its obligations arising from the Convention, particularly in respect of habitat protection, it produced the Habitats Directive in

1992, and subsequently set up the Natura 2000 network. The Emerald Network is based on the same principles as Natura 2000, and represents its de facto extension to non-Union countries. Bottlenose dolphins (*Tursiops truncatus*) are part of the list for current focus (Council of Europe, 2011).

361. The Pan-European Biological and Landscape Diversity Strategy also aims to ensure that a full range of ecosystems, habitats, species and landscapes of European importance is conserved; habitats are large enough to place species in a favourable conservation status; there are sufficient opportunities for the dispersal and migration of species; damaged parts of the key environmental systems are restored; the key environmental systems are buffered from potential threats. The network intends to link core areas physically through the restoration or preservation of corridors. The strategy differs from previous attempts to conserve biodiversity through a vast geographical scope, covering virtually the entire continent of Europe and northern and central Asia; ensuring that the ecosystems on which species depend continue to function, rather than protecting only threatened species or a limited number of valuable sites; bringing the conservation of biodiversity and landscapes into an integrated framework; and providing for a systematic programme of concrete actions that are designed to ensure that long-term conservation objectives are achieved (Council of Europe, 1995; Bern Convention, 2010).

V. Analysis of gaps and overlaps between CMS activities and the reviewed MEAs

362. There is a large array of issue-specific MEAs and RFMOs that are each addressing aspects of or are related to the conservation of cetaceans. However, there is a strong need to harmonize these different efforts, to avoid piecemeal intervention, uncoordinated activities and waste of energy. While each of the MEAs reviewed has a significant depth and strength focused on one or several of the listed threats (i.e. IMO on ship strikes or OSPAR on protecting marine biodiversity in the North East Atlantic), and in the case of IWC and CITES significant and important strength in the regulation of whaling and the control of trade for species of cetaceans respectively, the analysis shows that CMS is the most appropriate vehicle to address the suite of *Adverse Human Induced Impacts on Cetaceans* identified in Resolution 8.22.

363. CMS's provisions are more direct and concrete than many other MEAs regarded as vehicles to protect wildlife. The CMS mandate is to address multiple threats from a species conservation and regional perspective, with the Conference of the Parties establishing species and populations requiring both a high level of protection (Appendix I listing) and cooperative engagement through the development of agreements and actions plans (Appendix II), as well as through the focused decision as Resolutions and Recommendations of the COP.

364. This report highlights the extent to which CMS has gradually been expanding its activities to meet its mandate for the conservation of cetaceans on its Appendices. In so doing, CMS has actually established the greatest global coverage of the threats identified when compared to IMO, IWC SC and CC, OSPAR, UNICPOLOS and the UNEP Regional Seas Programme, CITES, CBD, Ramsar and EU Legislation. However, CMS requires institutional strengthening to fully meet the aspiration of its mandate.

V (a) Summary of MEA coverage of the listed threats

365. *Resolution 8.22: Adverse Human Induced Impacts on Cetaceans* requires a review of the extent to which CMS and CMS cetacean-related Agreements are addressing the listed impacts through their threat abatement activities; an analysis of the gaps and overlaps between CMS activities and the reviewed MEAs; identifying where collaboration and synergies can exist; and finally the identification of priority impacts and regions requiring urgent attention and develops recommendations for how these priorities can be addressed by CMS.

366. The following summaries represent a short précis of the more comprehensive MEA reviews in the previous sections of the document and geographically represent the extent to which each MEA directly or indirectly addresses the listed threats. This is assessed from an overarching global level as well as by more focused work in each of the regions.

367. For the purpose of this review and to better illuminate where threats are being addressed and where gaps exist, the coverage is represented at a global (overarching) level as well as regionally. For instance the CMS Conference of the Parties passing *Resolution 8.13: Climate Change and Migratory Species* is represented as addressing the threat of climate change at a global level, whereas developing the Western African Aquatic Mammals MOU and considering bycatch in this region is represented addressing bycatch at a regional level. Similarly, UNEP's development of SPREP and SPAW are considered to be addressing threats at a regional level, as is CMS's development of ASCOBANS and ACCOBAMS.

368. There is a further basic assessment provided as to whether a threat is being addressed directly {■} or indirectly {▨}. For example ASCOBANS addressing habitat and feeding ground degradation in the North East Atlantic is represented as directly {■} benefiting cetaceans, whereas OSPAR's consideration of a range of issues that might have an indirect impact on addressing habitat and feeding ground degradation in the same region, without that having been the focus of the decision or action, is represented as indirectly {▨} benefiting cetaceans. Where table fields are split in half, this indicates that only a part of the region is being addressed. Where CMS has listed key species on Appendix I or II, but has not yet progressed an agreement or specific resolution for their consideration, these decisions are represented as an indirect benefit to cetaceans, as no tangible conservation activity has yet progressed - Appendix I as { } and Appendix II as { }. CMS is the only MEA where this additional layer of assessment is applied. Finally, while North East Pacific Ocean (Pacific North America) and the Central East Pacific Ocean (Eastern Tropical Pacific) are considered separately in the threats review (Section II), given the low number of countries involved, they are merged into one assessment region for the purposes of the MEAs review policy analysis – as Central and North East Pacific Ocean.

369. **CMS Family summary:** The CMS Family both globally take forward decisions for collaborative action for all of the listed threats; lists key species on its appendices highlighting an intent to progress species-specific conservation across their migratory range; have established key regional agreements in four regions; and agreed to investigate moving forward with additional conservation mechanisms in a further two regions all of which directly and indirectly benefit cetaceans.

Table 4: CMS Family summary	entanglement and by-catch	climate change	ship strikes	pollution	habitat and feeding ground degradation	marine noise	other impediments to migration
Global							
North East Atlantic Ocean							
Mediterranean and Black Seas							
Central and South East Atlantic Ocean (Western Africa)							
North West Atlantic Ocean (Atlantic North America and the Caribbean)							
South West Atlantic Ocean (Atlantic Latin America)							
Central and North East Pacific Ocean (Pacific North America and Eastern Tropical Pacific)							
South East Pacific Ocean (Pacific Latin America)							
Central and North West Pacific Ocean (East and South East Asia)							
Pacific Islands Region							
Indian Ocean							
Arctic Seas							
Southern Ocean and Antarctic Seas							

370. **UNICPOLOS summary:** UNICPOLOS globally takes forward discussions about collaborative action across a number of the listed threats, which indirectly benefit cetaceans.

Table 5: UNCLOS/UNICPOLOS summary	entanglement and by-catch	climate change	ship strikes	pollution	habitat and feeding ground degradation	marine noise	other impediments to migration
Global							
North East Atlantic Ocean							
Mediterranean and Black Seas							
Central and South East Atlantic Ocean (Western Africa)							
North West Atlantic Ocean (Atlantic North America and the Caribbean)							
South West Atlantic Ocean (Atlantic Latin America)							
Central and North East Pacific Ocean (Pacific North America and Eastern Tropical Pacific)							
South East Pacific Ocean (Pacific Latin America)							
Central and North West Pacific Ocean (East and South East Asia)							
Pacific Islands Region							
Indian Ocean							
Arctic Seas							
Southern Ocean and Antarctic Seas							

371. **CITES summary:** CITES globally takes forward decisions for collaborative action on the restriction of trade that directly benefit cetaceans.

Table 6: CITES summary	entanglement and by-catch	climate change	ship strikes	pollution	habitat and feeding ground degradation	marine noise	other impediments to migration
Global							
North East Atlantic Ocean							
Mediterranean and Black Seas							
Central and South East Atlantic Ocean (Western Africa)							
North West Atlantic Ocean (Atlantic North America and the Caribbean)							
South West Atlantic Ocean (Atlantic Latin America)							
Central and North East Pacific Ocean (Pacific North America and Eastern Tropical Pacific)							
South East Pacific Ocean (Pacific Latin America)							
Central and North West Pacific Ocean (East and South East Asia)							
Pacific Islands Region							
Indian Ocean							
Arctic Seas							
Southern Ocean and Antarctic Seas							

372. **CBD summary:** CBD globally takes forward decisions for collaborative action across a number of the listed threats, that directly benefits cetaceans and for domestic priority that indirectly benefit cetaceans.

Table 7: CBD summary	entanglement and by-catch	climate change	ship strikes	pollution	habitat and feeding ground degradation	marine noise	other impediments to migration
Global							
North East Atlantic Ocean							
Mediterranean and Black Seas							
Central and South East Atlantic Ocean (Western Africa)							
North West Atlantic Ocean (Atlantic North America and the Caribbean)							
South West Atlantic Ocean (Atlantic Latin America)							
Central and North East Pacific Ocean (Pacific North America and Eastern Tropical Pacific)							
South East Pacific Ocean (Pacific Latin America)							
Central and North West Pacific Ocean (East and South East Asia)							
Pacific Islands Region							
Indian Ocean							
Arctic Seas							
Southern Ocean and Antarctic Seas							

373. **Ramsar summary:** Ramsar has established key regional habitat protection mechanisms which indirectly benefit cetaceans.

Table 8: Ramsar summary	entanglement and by-catch	climate change	ship strikes	pollution	habitat and feeding ground degradation	marine noise	other impediments to migration
Global							
North East Atlantic Ocean					▨		
Mediterranean and Black Seas					▨		
Central and South East Atlantic Ocean (Western Africa)					▨		
North West Atlantic Ocean (Atlantic North America and the Caribbean)					▨		
South West Atlantic Ocean (Atlantic Latin America)							
Central and North East Pacific Ocean (Pacific North America and Eastern Tropical Pacific)					▨		
South East Pacific Ocean (Pacific Latin America)					▨		
Central and North West Pacific Ocean (East and South East Asia)							
Pacific Islands Region					▨		
Indian Ocean					▨		
Arctic Seas							
Southern Ocean and Antarctic Seas							

374. **IMO summary:** IMO globally takes forward decisions for collaborative action about the reduction of ship strikes which directly benefits cetaceans and across a number of the listed threats as they pertain to the shipping industry, protecting key ecosystems from pollution which indirectly benefits cetaceans.

Table 9: IMO summary	entanglement and by-catch	climate change	ship strikes	pollution	habitat and feeding ground degradation	marine noise	other impediments to migration
Global		▨	■	▨		▨	
North East Atlantic Ocean				▨	▨		
Mediterranean and Black Seas				▨	▨		
Central and South East Atlantic Ocean (Western Africa)							
North West Atlantic Ocean (Atlantic North America and the Caribbean)			▨	▨	▨		
South West Atlantic Ocean (Atlantic Latin America)							
Central and North East Pacific Ocean (Pacific North America and Eastern Tropical Pacific)							
South East Pacific Ocean (Pacific Latin America)				▨	▨		
Central and North West Pacific Ocean (East and South East Asia)							
Pacific Islands Region				▨	▨		
Indian Ocean				▨	▨		
Arctic Seas							
Southern Ocean and Antarctic Seas				▨	▨		

375. **IWC SC and IWC CC summary:** IWC globally takes forward decisions for collaborative action across all of the listed threats as they pertain to the resumption of sustainable whaling that directly and indirectly benefit cetaceans.

Table 10: IWC SC and CC summary	entanglement and by-catch	climate change	ship strikes	pollution	habitat and feeding ground degradation	marine noise	other impediments to migration
Global							
North East Atlantic Ocean							
Mediterranean and Black Seas							
Central and South East Atlantic Ocean (Western Africa)							
North West Atlantic Ocean (Atlantic North America and the Caribbean)							
South West Atlantic Ocean (Atlantic Latin America)							
Central and North East Pacific Ocean (Pacific North America and Eastern Tropical Pacific)							
South East Pacific Ocean (Pacific Latin America)							
Central and North West Pacific Ocean (East and South East Asia)							
Pacific Islands Region							
Indian Ocean							
Arctic Seas							
Southern Ocean and Antarctic Seas							

376. **UNEP Regional Seas summary:** UNEP Regional Seas has established key regional mechanisms which address all of the listed threats and both directly (SPAW and SPREP) and indirectly benefit cetaceans.

Table 11: UNEP Regional Seas summary	entanglement and by-catch	climate change	ship strikes	pollution	habitat and feeding ground degradation	marine noise	other impediments to migration
Global							
North East Atlantic Ocean							
Mediterranean and Black Seas							
Central and South East Atlantic Ocean (Western Africa)							
North West Atlantic Ocean (Atlantic North America and the Caribbean)							
South West Atlantic Ocean (Atlantic Latin America)							
Central and North East Pacific Ocean (Pacific North America and Eastern Tropical Pacific)							
South East Pacific Ocean (Pacific Latin America)							
Central and North West Pacific Ocean (East and South East Asia)							
Pacific Islands Region							
Indian Ocean							
Arctic Seas							
Southern Ocean and Antarctic Seas							

377. **Bern Convention:** The Bern Convention regionally takes forward decisions for collaborative action on habitat protection that directly benefits cetaceans.

Table 12: Bern Convention summary	entanglement and by-catch	climate change	ship strikes	pollution	habitat and feeding ground degradation	marine noise	other impediments to migration
Global							
North East Atlantic Ocean							
Mediterranean and Black Seas							
Central and South East Atlantic Ocean (Western Africa)							
North West Atlantic Ocean (Atlantic North America and the Caribbean)							
South West Atlantic Ocean (Atlantic Latin America)							
Central and North East Pacific Ocean (Pacific North America and Eastern Tropical Pacific)							
South East Pacific Ocean (Pacific Latin America)							
Central and North West Pacific Ocean (East and South East Asia)							
Pacific Islands Region							
Indian Ocean							
Arctic Seas							
Southern Ocean and Antarctic Seas							

V (b) Other instruments: Food and Agriculture Organization of the United Nations and Western Hemisphere Migratory Species Initiative

378. The Committee on Fisheries (COFI), a subsidiary body of the Council of the Food and Agriculture Organization of the United Nations (FAO), was established by the FAO Conference at its Thirteenth Session in 1965. The Committee presently constitutes the only global inter-governmental forum where major international fisheries and aquaculture problems and issues are examined and recommendations addressed to governments, regional fishery bodies, NGOs, fish workers, FAO and international community, are made periodically on a world-wide basis. COFI has also been used as a forum in which global Regional Fisheries Management Organizations (RFMOs) have been negotiated. The two main functions of COFI are to review the programmes of work of FAO in the field of fisheries and aquaculture and their implementation, and to conduct periodic general reviews of fishery and aquaculture problems of an international character and appraise such problems and their possible solutions with a view to concerted action by nations, by FAO, inter-governmental bodies and the civil society. The Committee also reviews specific matters relating to fisheries and aquaculture. COFI's work supplements rather than supplants other RFMOs working in the field of fisheries and aquaculture.

379. In addition to the reviewed MEAs, it is important to also recognize that FAO/COFI and the various RFMOs globally and regionally take forward decisions for cooperative priority to address fisheries impacts that indirectly benefit cetaceans. The core analysis of this is expected to be drawn from the Assessment of Bycatch in Gillnet Fisheries (UNEP/CMS/Conf.10.33)

380. Another instrument of specific importance to this review is the Western Hemisphere Migratory Species Initiative (WHMSI). WHMSI contributes to the conservation of the migratory species of the Western Hemisphere by strengthening cooperation and communication among States, international initiatives and civil society, and by expanding constituencies, awareness and political support. All countries of the Western Hemisphere are parties to international conventions, treaties and accords as a result of which they are committed to the conservation of migratory species. WHMSI is an initiative to assist countries in fulfilling this commitment. WHMSI was developed by wildlife agency directors and other senior officials who gathered in Chile in 2003 as a cooperative hemispheric mechanism to conserve shared migratory species. CMS is a partner organization.

V (c) Comparative MEA coverage of the listed threats

381. Noting *Table 1: Priority weighting for global and regional threats to cetaceans* (Section II (o)) that provides an indicative weighting for global and regional threats to cetaceans, the comparative coverage of each of the MEAs within each of the regions is considered against each of the listed threats.

Table 13: Gaps and overlaps	entanglement and by-catch	climate change	ship strikes	pollution	habitat/feeding ground degradation	marine noise	other impediments to migration
Global	CMS IWC UNICPOLOS FAO/COFI	CMS IWC IMO UNICPOLOS CBD	CMS IMO IWC	CMS IMO IWC UNICPOLOS	CMS IMO UNICPOLOS CBD	CMS IWC IMO	CMS IWC CITES
North East Atlantic Ocean	CMS (ASCOBANS / ACCOBAMS) FAO/COFI	CMS (ASCOBANS / ACCOBAMS) OSPAR	CMS (ASCOBANS / ACCOBAMS) OSPAR	CMS (ASCOBANS / ACCOBAMS) UNEP IMO OSPAR	CMS (ASCOBANS / ACCOBAMS) Bern OSPAR IMO CBD RAMSAR	CMS (ASCOBANS / ACCOBAMS) OSPAR	CMS (ASCOBANS / ACCOBAMS) CITES
Mediterranean and Black Seas	CMS (ACCOBAMS) FAO/COFI	CMS (ACCOBAMS)	CMS (ACCOBAMS)	CMS (ACCOBAMS) UNEP IMO	CMS (ASCOBANS / ACCOBAMS) Bern IMO CBD RAMSAR	CMS (ACCOBAMS)	CMS (ACCOBAMS) CITES
Central and South East Atlantic Ocean (Western Africa)	CMS (West African MM) FAO/COFI	CMS (West African MM)	CMS (West African MM)	CMS (West African MM) UNEP	CMS (West African MM) CBD RAMSAR	CMS (West African MM)	CMS (West African MM) CITES
North West Atlantic Ocean (Atlantic North America and the Caribbean)	UNEP (SPAW) FAO/COFI	UNEP (SPAW) WHMSI	UNEP (SPAW)	UNEP (SPAW) IMO	UNEP (SPAW) IMO CBD RAMSAR WHMSI	UNEP (SPAW)	UNEP (SPAW) CITES
South West Atlantic Ocean (Atlantic Latin America)	CMS UNEP RS FAO/COFI	CMS UNEP RS WHMSI	CMS UNEP RS	CMS UNEP RS	CMS UNEP RS CBD WHMSI	CMS	CITES CMS
Central and North East Pacific Ocean (Pacific North America and Eastern Tropical Pacific)	FAO/COFI	WHMSI		UNEP	RAMSAR WHMSI		CITES
South East Pacific Ocean (Pacific Latin America)	CMS UNEP RS FAO/COFI	CMS UNEP RS WHMSI	CMS UNEP RS	CMS UNEP RS IMO	CMS UNEP IMO CBD RAMSAR WHMSI	CMS UNEP RS	CMS
Central and North West Pacific Ocean (East and South East Asia)	UNEP RS FAO/COFI	UNEP RS	UNEP RS	UNEP RS	UNEP RS CBD		CITES
Pacific Islands Region	CMS (Pacific Cetaceans) UNEP (SPREP) FAO/COFI	CMS (Pacific Cetaceans) UNEP (SPREP)	CMS (Pacific Cetaceans) UNEP (SPREP)	CMS (Pacific Cetaceans) UNEP (SPREP)	CMS (Pacific Cetaceans) UNEP (SPREP) IMO CBD RAMSAR	CMS (Pacific Cetaceans) UNEP (SPREP)	CMS (Pacific Cetaceans) UNEP (SPREP) CITES
Indian Ocean	CMS UNEP RS FAO/COFI	CMS UNEP RS	CMS UNEP RS	CMS IMO UNEP RS	CMS IMO UNEP RS CBD RAMSAR	CMS	CMS
Arctic Seas	FAO/COFI	CMS			CMS CBD		CITES
Southern Ocean and Antarctic Seas	FAO/COFI		CMS		IMO	CMS IMO CBD	CITES

VI. Collaboration, synergy and a CMS Global Programme of Work for Cetaceans

382. The greatest challenge for CMS is to increase its collaboration and coordination with the large array of issue specific MEAs and RFMOs that are each addressing aspects of or are related to the conservation of cetaceans.

383. It is important to reiterate that this review reveals CMS to be best positioned to address the individual and cumulative suite of threats identified in *Resolution 8.22: Adverse Human Induced Impacts on Cetaceans*. The author asserts that CMS already has the greatest potential for global and regional coverage when compared to IMO, IWC SC and IWC CC, OSPAR, UNICPOLOS and the UNEP Regional Seas Programme, CITES, CBD, Ramsar and the Bern Convention. However, each of these MEAs has significant focused competencies that are of benefit to cetaceans. Similarly a number of RFMOs also have important competencies that can be of benefit to cetaceans. Therefore collaborating and coordinating work between key MEAs and RFMOs to achieve the priorities of CMS is the most appropriate path forward.

384. Informed by the threats highlighted and MEA reviews contained in this document, the following draft programme of work seeks to highlight again CMS's own priorities, determine what collaboration and synergies are possible across the political processes reviewed, and the resources and mechanisms that might be developed to facilitate these priorities over the period 2012-2024 - to develop a modern cetacean conservation mandate through a *CMS Global Programme of Work for Cetaceans*

VI (a) CMS Global Programme of Work for Cetaceans (2012-2024)

385. To facilitate this work the CMS Conference of the Parties may consider:

- a. mandating and resourcing the Scientific Council's Aquatic Mammals Working Group (AMWG), chaired by the CMS Appointed Councillor for Aquatic Mammals and supported by the relevant species focal points, to engage with this *Global Programme of Work for Cetaceans* and any other aquatic mammals work programmes developed through CMS processes;
- b. encouraging ongoing participation of the Scientific or Advisory bodies of all existing and future CMS aquatic mammal agreements, relevant IUCN Specialist Groups; experts from FAO/COFI, CITES and IWC; and experts from CMS Partner Organizations;
- c. encouraging the intersessional engagement of the AMWG to operate electronically;
- d. requesting that the AMWG establish and report to CMS COP11, a *modus operandi* that can:
 - i. facilitate an increase in information flow between FAO/COFI, CITES and IWC and the development of expert advice to CITES and IWC;
 - ii. respond to direct requests for input from the CMS Scientific Council through the Chair of the CMS Scientific Council and the CMS Appointed Councillor for Marine Mammals;
 - iii. develop advisory positions for use in Environmental Impact Assessments at the regional level;
 - iv. establish regional priorities for conservation research for consideration and endorsement by the CMS Scientific Council;
 - v. develop appropriate metrics for the reporting of regional conservation progress, to ensure the *CMS Global Programme of Work for Cetaceans* can be regularly and consistently assessed and forecast forward ;
 - vi. facilitate appropriate processes to forecast forward the next iteration of the *CMS Global Programme of Work for Cetaceans*; and
- e. providing for dedicated Secretariat staff and budget to take forward a *CMS Global Programme of Work for Cetaceans*

Global actions

386. Based on the review of information, global collaborative action to address entanglement and bycatch, climate change and whaling (other impediments to migration) are weighted as high; ship strikes, pollution, marine noise and habitat and feeding ground degradation are lower (Section II). The CMS Family, IMO, CITES,

FAO/COFI and IWC each have important roles in determining the global strategies for the reviewed threats (Sections III, IV and V).

387. In addition to the relevant actions arising from Conf 10.10: Online Reporting, Harmonization of Information and Knowledge Management, Conf 10.20: Future Shape Outcome; Conf 10.22: Strategic Plan 2012-2014; Conf 10.33: Assessment of Bycatch in Gill Net Fisheries; Conf 10.40: Impact of Climate Change on Migratory Species; and Conf 10.41: Marine Debris the following activities respond directly to the threats review contained in this document and the historical decisions of the CMS Conference of the Parties.

In the period 2012-2017 (from COP10 to COP12)

388. The Secretariat and the Scientific Council should establish greater cooperation and collaboration with:
- a. FAO/COFI for overarching fisheries and bycatch policy development;
 - b. UNICPOLOS and other UNGA high seas dialogues (*UNGA Ad Hoc Open-ended Informal Working Group to Study Issues Relating to the Conservation and Sustainable Use of Marine Biological Diversity Beyond Areas of National Jurisdiction* and the *UN Open-ended Informal Consultative Process on Oceans and the Law of the Sea*) to define and establish the contribution CMS can make in high seas species conservation;
 - c. CITES to support and complement the conservation activities of each convention. In particular:
 - i. develop a formal process for the provisions of relevant information between CMS and CITES on proposed changes to each Convention's Appendices listings and impacts and relevance of COP resolution positions where there is commonality between the conventions;
 - ii. CMS, also representing CMS agreements when needed, to formally contribute to the deliberations of CITES Animals Committee; and
 - iii. CMS and CMS agreements recognized as source of information for CITES Parties' Scientific Authorities in the preparation of available data on population status, distribution, population trends and other biological and ecological factors in the preparation and assessment of non-detriment findings (NDFs).
 - d. IWC SC and IWC CC to increase direct collaboration on issues of shared concern and especially concerning any IWC decisions that might impact on CMS Appendix I listed species, including:
 - i. Blue whale (*Balaenoptera musculus*)
 - ii. Bowhead whale (*Balaena mysticetus*)
 - iii. Fin whale (*Balaenoptera physalus*)
 - iv. Humpback whale (*Megaptera novaeangliae*)
 - v. North Pacific right whale (*Eubalaena japonica*)
 - vi. North Atlantic right whale (*Eubalaena glacialis*)
 - vii. Sei whale (*Balaenoptera borealis*)
 - viii. Southern right whale (*Eubalaena australis*)
 - ix. Sperm whale (*Physeter macrocephalus*)
389. The AMWG should:
- a. develop appropriate metrics for the reporting of regional conservation progress, to ensure the CMS Global Programme of Work for Cetaceans can be regularly and consistently assessed and forecast;
 - b. provide advice as requested for CMS's engagement with FAO/COFI, UNICPOLOS, CITES and IWC;
 - c. host a workshop to review and provide advice on the impact of the emergent science of cetacean social complexity and culture, as it relates to regional populations and to inform forward decision about CMS conservation priorities;
 - d. develop advisory positions for use in Environmental Impact Assessments at the regional level;
 - e. develop regular reports on progress of the CMS Global Programme of Work for Cetaceans for COP11 and COP12;
 - f. facilitate the development of thematic resolutions addressing priority threats for COP11 and COP12; and
 - g. support Parties in the development of any regional cetacean-related agreements and action plans prioritised by the COP.

In the period 2017-2024 (from COP12 to COP14)

390. The AMWG should:
- a. provide advice as requested for CMS's engagement with FAO/COFI, UNICPOLOS, CITES and IWC;
 - b. develop advisory positions for use in Environmental Impact Assessments at the regional level;
 - c. establish regional priorities for conservation research;
 - d. develop regular reports on progress of the CMS Global Programme of Work for Cetaceans for COP13 and COP14;
 - e. facilitate the development of thematic resolutions addressing priority threats for COP13 and COP14;
 - f. support Parties in the development of any regional cetacean-related agreements and action plans prioritised by the COP; and
 - g. facilitate appropriate processes to forecast the next iteration of the CMS Global Programme of Work for Cetaceans.

North East Atlantic Ocean actions

391. In the North East Atlantic Ocean collaborative action to address entanglement and bycatch, pollution and noise pollution are weighted as high priorities; habitat and feeding ground degradation and whaling are medium; climate change and ship strikes are lower (Section II).

392. 15 species and populations are listed on the CMS Appendices for this region, and these are:
1. Atlantic white-sided dolphin (*Lagenorhynchus acutus*) Appendix II
 2. Blue whale (*Balaenoptera musculus*) Appendix I + Concerted/Cooperative Action
 3. Common bottlenose dolphin (*Tursiops truncatus*) Appendix II
 4. Fin whale (*Balaenoptera physalus*) Appendix I/II + Concerted/Cooperative Action
 5. Harbour porpoise / Common porpoise (*Phocoena phocoena*) Appendix II
 6. Humpback whale (*Megaptera novaeangliae*) Appendix I + Concerted/Cooperative Action
 7. Killer whale / Orca (*Orcinus orca*) Appendix II
 8. Long-finned pilot whale (*Globicephala melas*) Appendix II
 9. Northern bottlenose whale (*Hyperoodon ampullatus*) Appendix II
 10. North Atlantic right whale (*Eubalaena glacialis*) Appendix I
 11. Risso's dolphin (*Grampus griseus*) Appendix II
 12. Sei whale (*Balaenoptera borealis*) Appendix I/II + Concerted/Cooperative Action
 13. Short-beaked common dolphin (*Delphinus delphis*) Appendix II
 14. Sperm whale (*Physeter macrocephalus*) Appendix I/II + Concerted/Cooperative Action
 15. White-beaked dolphin (*Lagenorhynchus albirostris*) Appendix II

393. ASCOBANS and ACCOBAMS both exist over part of the region and ASCOBANS and ACCOBAMS Parties both have established forward programmes of work. The suite of EU Legislation also has a mandate extending over much of this region, as does the Bern Convention (Sections III, IV and V).

In the period 2012-2017 (from COP10 to COP12)

394. The Secretariat and the Scientific Council should:
- a. establish greater cooperation and collaboration between CMS, ASCOBANS, ACCOBAMS and the Bern Convention;
 - b. establish greater cooperation and collaboration between CMS, ASCOBANS and OSPAR on the identification and protection of harbour porpoise (*Phocoena phocoena*) habitats within the overlapping ASCOBANS and OSPAR areas;
 - c. increase the collaboration between CMS, ASCOBANS and IMO. This is already a positive and important relationship;
 - d. establish an active collaboration agreement with relevant RFMOs, with the objective of measurably reducing cetacean bycatch;
395. The AMWG should:
- a. provide support to ASCOBANS, especially with assessing and defining appropriate standards for noise pollution and also the impacts of hunts adjacent to this region on small cetaceans within the ASCOBANS area; and
 - b. develop comprehensive reports on regional progress of the CMS Global Programme of Work for Cetaceans for COP11 and COP12.

In the period 2017-2024 (from COP12 to COP14)

396. The Secretariat and the Scientific Council should:
- a. collaborate with ASCOBANS Parties to assess the benefits of geographically extending the ASCOBANS region to encompass the whole of the regional range of the 15 Appendix I listed species and extending the mandate of ASCOBANS to cover the Appendix I listed great whales;
 - b. extend the cooperation and collaboration between CMS, ASCOBANS and OSPAR on the identification and protection of bowhead whale (*Balaena mysticetus*), blue whale (*Balaenoptera musculus*), northern right whale (*Eubalaena glacialis*) and harbour porpoise (*Phocoena phocoena*) habitats within the overlapping ASCOBANS and OSPAR areas;
397. The AMWG should:
- a. provide support to ASCOBANS, especially with assessing and defining appropriate standards for noise pollution and also the impacts of hunts adjacent to this region on small cetaceans within the ASCOBANS area; and
 - b. develop comprehensive reports on regional progress of the CMS Global Programme of Work for Cetaceans for COP13 and COP14.

Mediterranean and Black Seas actions

398. In the Mediterranean and Black Seas collaborative action to address entanglement and bycatch (including driftnet fisheries), pollution and habitat and feeding ground degradation are weighted as high priorities; ship strikes, marine noise and climate change as medium; other impediments to migration are lower (Section II).

399. Eight species and populations are listed on the CMS Appendices for this region, and these are:
1. Common bottlenose dolphin (*Tursiops truncatus ponticus*) Appendix I + Concerted/Cooperative Action
 2. Fin whale (*Balaenoptera physalus*) Appendix I/II + Concerted/Cooperative Action
 3. Harbour porpoise / Common porpoise (*Phocoena phocoena*) Appendix II
 4. Killer whale / Orca (*Orcinus orca*) Appendix II
 5. Risso's dolphin (*Grampus griseus*) Appendix II
 6. Short-beaked common dolphin (*Delphinus delphis*) Appendix I (Mediterranean population) / II
 7. Sperm whale (*Physeter macrocephalus*) Appendix I/II + Concerted/Cooperative Action
 8. Striped dolphin (*Stenella coeruleoalba*) Appendix II

400. ACCOBAMS exists over the entire region and over all cetaceans within the region. ACCOBAMS Parties have an established a forward programme of work. The suite of EU Legislation also has a mandate extending over part of this region with North African range States over other areas (Sections III, IV and V).

In the period 2012-2017 (from COP10 to COP12)

401. The Secretariat and the Scientific Council should:
- a. establish greater cooperation and collaboration between CMS, ACCOBAMS, the Bern Convention, the Barcelona Convention and the Bucharest Convention;
 - b. establish greater cooperation and collaboration between CMS, ACCOBAMS and OSPAR on the identification and protection of bowhead whale (*Balaena mysticetus*), blue whale (*Balaenoptera musculus*) and northern right whale (*Eubalaena glacialis*) habitats within the overlapping ACCOBAMS and OSPAR areas;
 - c. increase the collaboration between CMS, ACCOBAMS and IMO. This is already a positive and important relationship;
 - d. establish an active collaboration agreement with relevant RFMOs, with the objective of measurably reducing cetacean bycatch;
402. The AMWG should:
- a. provide support to ACCOBAMS, especially with assessing and defining appropriate standards for noise pollution; and
 - b. develop comprehensive reports on regional progress of the CMS Global Programme of Work for Cetaceans for COP11 and COP12.

In the period 2017-2024 (from COP12 to COP14)

403. The AMWG should:
- a. provide support to ACCOBAMS, especially with assessing and defining appropriate standards for noise pollution; and
 - b. develop comprehensive reports on regional progress of the CMS Global Programme of Work for Cetaceans for COP13 and COP14.

Central and South East Atlantic Ocean (Western Africa) actions

404. In the Central and South East Atlantic Ocean collaborative action to address entanglement and bycatch and marine bushmeat (other impediments to migration) are weighted as high priorities; pollution, marine noise and habitat and feeding ground degradation are weighted as medium; climate change and ship strikes are lower (Section II).

405. 10 species and populations are listed on the CMS Appendices for this region, and these are:
1. Atlantic humpback dolphin (*Sousa teuszii*) Appendix I/II
 2. Blue whale (*Balaenoptera musculus*) Appendix I + Concerted/Cooperative Action
 3. Bryde's whale (*Balaenoptera edeni*) Appendix II
 4. Clymene dolphin (*Stenella clymene*) Appendix II
 5. Fin whale (*Balaenoptera physalus*) Appendix I/II + Concerted/Cooperative Action
 6. Harbour porpoise / Common porpoise (*Phocoena phocoena*) Appendix II
 7. Humpback whale (*Megaptera novaeangliae*) Appendix I + Concerted/Cooperative Action
 8. Killer whale / Orca (*Orcinus orca*) Appendix II
 9. Sei whale (*Balaenoptera borealis*) Appendix I/II + Concerted/Cooperative Action
 10. Sperm whale (*Physeter macrocephalus*) Appendix I/II + Concerted/Cooperative Action

406. The Western African Aquatic Mammals MOU exists over domestic waters along the western African coastline and the Western African Aquatic Mammals MOU Signatories have established an Action Plan (Sections III, IV and V). A commitment of monetary support for this programme of work should be considered a priority by the CMS Parties.

In the period 2012-2017 (from COP10 to COP12)

407. The Secretariat and the Scientific Council should:
- a. identify and establish greater collaboration between CMS, the UNEP Regional Seas Programme and the Abidjan Convention as appropriate;
 - b. develop an active collaboration agreement with relevant RFMOs, with the objective of measurably reducing cetacean bycatch;
 - c. approach CITES to discuss cooperative support for addressing marine bushmeat as a regional issue;

408. The AMWG should:
- a. provide support to the Western African Aquatic Mammals MOU, especially with assessing and developing mitigation measures for the region bycatch and marine bushmeat, identifying critical habitat for protection and defining appropriate standards for noise pollution; and
 - b. develop comprehensive reports on regional progress of the CMS Global Programme of Work for Cetaceans for COP11 and COP12.

In the period 2017-2024 (from COP12 to COP14)

409. The Secretariat and the Scientific Council should:
- a. collaborate with the Western African Aquatic Mammals MOU Signatories to assess the benefits of extending the agreement area of the Western African Aquatic Mammals MOU to encompass the high seas area of this region;
 - b. collaborate with the Western African Aquatic Mammals MOU Signatories to assess the benefits of extending the scope of the agreement to include the Appendix I listed great whales;
410. The AMWG should:
- a. provide support to the Western African Aquatic Mammals MOU, especially with assessing and developing mitigation measures for the region bycatch and marine bushmeat, identifying critical habitat for protection and defining appropriate standards for noise pollution; and

- b. develop comprehensive reports on regional progress of the CMS Global Programme of Work for Cetaceans for COP13 and COP14

North West Atlantic Ocean (Atlantic North America and the Caribbean) actions

411. In the Caribbean Seas and North West Atlantic Ocean collaborative action to address entanglement and bycatch, ship strikes and marine noise are weighted as high priorities; habitat and feeding ground degradation and hunting (other impediments to migration) are weighted as medium; climate change and pollution as lower (Section II).

412. Nine species and populations are listed on the CMS Appendices for this region, and these are:
1. Blue whale (*Balaenoptera musculus*) Appendix I + Concerted/Cooperative Action
 2. Bryde's whale (*Balaenoptera edeni*) Appendix II
 3. Fin whale (*Balaenoptera physalus*) Appendix I/II + Concerted/Cooperative Action
 4. Humpback whale (*Megaptera novaeangliae*) Appendix I + Concerted/Cooperative Action
 5. Killer whale / Orca (*Orcinus orca*) Appendix II
 6. Northern bottlenose whale (*Hyperoodon ampullatus*) Appendix II
 7. North Atlantic right whale (*Eubalaena glacialis*) Appendix I
 8. Sei whale (*Balaenoptera borealis*) Appendix I/II + Concerted/Cooperative Action
 9. Sperm whale (*Physeter macrocephalus*) Appendix I/II + Concerted/Cooperative Action

In the period 2012-2017 (from COP10 to COP12)

413. The Secretariat and the Scientific Council should:
- a. establish greater collaboration with the UNEP Regional Seas Programme, the Western Hemisphere Migratory Species Initiative (WHMSI), the Cartagena Convention and SPAW. SPAW's established forward programme of work could be built upon to also encompass the CMS listed species, for the benefit of Caribbean CMS Parties;
 - b. develop an active collaboration agreement with relevant RFMOs, including the International Commission for the Conservation of Atlantic Tunas (ICCAT) with the objective of measurably reducing cetacean bycatch; and
 - c. investigate an arrangement with the Western Hemisphere Migratory Species Initiative (WHMSI) to deliver a regional Action Plan for the CMS species of North America and the Caribbean;
414. The AMWG should:
- a. provide support to the region and collaborate with SPAW and WHMSI, especially with assessing and developing mitigation measures for the region's bycatch, identifying critical habitat for protection and defining appropriate standards for noise pollution; and
 - b. develop comprehensive reports on regional progress of the CMS Global Programme of Work for Cetaceans for COP11 and COP12.

In the period 2017-2024 (from COP12 to COP14)

415. The AMWG should:
- a. provide support to the region and collaborate with SPAW and WHMSI, especially with assessing and developing mitigation measures for the region's bycatch, identifying critical habitat for protection and defining appropriate standards for noise pollution; and
 - b. develop comprehensive reports on regional progress of the CMS Global Programme of Work for Cetaceans for COP13 and COP14.

South West Atlantic Ocean (Atlantic Latin America) actions

416. In the South West Atlantic Ocean collaborative action to address entanglement and bycatch and marine bushmeat (other impediments to migration) are weighted as high priorities; ship strikes, pollution and habitat and feeding ground degradation as medium priorities; climate change and marine noise as lower (Section II).

417. 17 species and populations are listed on the CMS Appendices for this region, are these are:
1. Amazon river dolphin / Boto (*Inia geoffrensis*) Appendix II
 2. Blue whale (*Balaenoptera musculus*) Appendix I + Concerted/Cooperative Action
 3. Bryde's whale (*Balaenoptera edeni*) Appendix II
 4. Burmeister's porpoise (*Phocoena spinipinnis*) Appendix II + Concerted/Cooperative Action
 5. Commerson's dolphin (*Cephalorhynchus commersonii*) Appendix II + Concerted/Cooperative Action

6. Dusky dolphin (*Lagenorhynchus obscurus*) Appendix II + Concerted/Cooperative Action
7. Fin whale (*Balaenoptera physalus*) Appendix I/II + Concerted/Cooperative Action
8. Franciscana / La Plata dolphin (*Pontoporia blainvillei*) Appendix I/II + Concerted/Cooperative Action
9. Guiana dolphin (*Sotalia guianensis*) Appendix II
10. Humpback whale (*Megaptera novaeangliae*) Appendix I + Concerted/Cooperative Action
11. Killer whale / Orca (*Orcinus orca*) Appendix II
12. Peale's dolphin / Black-chinned dolphin (*Lagenorhynchus australis*) Appendix II + Concerted/Cooperative Action
13. Sei whale (*Balaenoptera borealis*) Appendix I/II + Concerted/Cooperative Action
14. Southern right whale (*Eubalaena australis*) Appendix I + Concerted/Cooperative Action
15. Spectacled porpoise (*Phocoena dioptrica*) Appendix II + Concerted/Cooperative Action
16. Sperm whale (*Physeter macrocephalus*) Appendix I/II + Concerted/Cooperative Action
17. Tucuxi (*Sotalia fluviatilis*) Appendix II

418. The historical discussion concerning these species within CMS indicates that the development of a regional Action Plan or agreement for these species is a priority.

In the period 2012-2017 (from COP10 to COP12)

419. The Secretariat and the Scientific Council should:
- a. investigate an arrangement with WHMSI to deliver a regional Action Plan for the CMS species of Latin America; and
 - b. develop an active collaboration agreement with relevant RFMOs, including the International Commission for the Conservation of Atlantic Tunas (ICCAT) with the objective of measurably reducing cetacean bycatch;
420. The AMWG should:
- a. provide support to the region and collaborate with WHMSI, especially with assessing and developing mitigation measures for the region's bycatch, identifying critical habitat for protection; and
 - b. develop comprehensive reports on regional progress of the CMS Global Programme of Work for Cetaceans for COP11 and COP12.

In the period 2017-2024 (from COP12 to COP14)

421. The AMWG should:
- a. provide support to the region and collaborate with WHMSI, especially with assessing and developing mitigation measures for the region's bycatch, identifying critical habitat for protection; and
 - b. develop comprehensive reports on regional progress of the CMS Global Programme of Work for Cetaceans for COP13 and COP14.

Central and North East Pacific Ocean (Pacific North America and Eastern Tropical Pacific) actions

422. In the Central and North East Pacific Ocean collaborative action to address entanglement and bycatch, marine noise and habitat and feeding ground degradation are weighted as high priorities; pollution and whaling (other impediments to migration) as medium priorities; and climate change and ship strikes as lower (Section II).

423. 14 species and populations are listed on the CMS Appendices for this region, and these are:
1. Baird's beaked whale (*Berardius bairdii*) Appendix II
 2. Blue whale (*Balaenoptera musculus*) Appendix I + Concerted/Cooperative Action
 3. Bryde's whale (*Balaenoptera edeni*) Appendix II
 4. Dall's porpoise (*Phocoenoides dalli*) Appendix II
 5. Fin whale (*Balaenoptera physalus*) Appendix I/II + Concerted/Cooperative Action
 6. Humpback whale (*Megaptera novaeangliae*) Appendix I + Concerted/Cooperative Action
 7. Killer whale / Orca (*Orcinus orca*) Appendix II
 8. North Pacific right whale (*Eubalaena japonica*) Appendix I
 9. Pantropical spotted dolphin (*Stenella attenuata*) Appendix II + Concerted/Cooperative Action
 10. Sei whale (*Balaenoptera borealis*) Appendix I/II + Concerted/Cooperative Action
 11. Short-beaked common dolphin (*Delphinus delphis*) Appendix II

12. Sperm whale (*Physeter macrocephalus*) Appendix I/II + Concerted/Cooperative Action
13. Spinner dolphin (*Stenella longirostris*) Appendix II + Concerted/Cooperative Action
14. Striped dolphin (*Stenella coeruleoalba*) Appendix II

In the period 2012-2017 (from COP10 to COP12)

424. The Secretariat and the Scientific Council should:
- a. investigate an arrangement with WHMSI to deliver a regional Action Plan, or agreement for these species;
 - b. develop an active collaboration agreement with relevant RFMOs, including the Inter-American Tropical Tuna Commission (IATTC) with the objective of measurably reducing cetacean bycatch;
425. The AMWG should:
- a. provide support to the region and collaborate with WHMSI, especially with assessing and developing mitigation measures for the region's bycatch, identifying critical habitat for protection and defining appropriate standards for noise pollution; and
 - b. develop comprehensive reports on regional progress of the CMS Global Programme of Work for Cetaceans for COP11 and COP12.

In the period 2017-2024 (from COP12 to COP14)

426. The AMWG should:
- a. provide support to the region and collaborate with WHMSI, especially with assessing and developing mitigation measures for the region's bycatch, identifying critical habitat for protection and defining appropriate standards for noise pollution; and
 - b. develop comprehensive reports on regional progress of the CMS Global Programme of Work for Cetaceans for COP13 and COP14.

South East Pacific Ocean (Pacific Latin America) actions

427. In the South East Pacific Ocean collaborative action to address entanglement and bycatch and marine bushmeat (other impediments to migration) are weighted as high priorities; climate change and ship strikes, pollution and marine noise as lower (Section II).

428. 13 species and populations are listed on the CMS Appendices for this region, are these are:
1. Blue whale (*Balaenoptera musculus*) Appendix I + Concerted/Cooperative Action
 2. Bryde's whale (*Balaenoptera edeni*) Appendix II
 3. Burmeister's porpoise (*Phocoena spinipinnis*) Appendix II + Concerted/Cooperative Action
 4. Chilean dolphin (*Cephalorhynchus eutropia*) Appendix II + Concerted/Cooperative Action
 5. Dusky dolphin (*Lagenorhynchus obscurus*) Appendix II + Concerted/Cooperative Action
 6. Fin whale (*Balaenoptera physalus*) Appendix I/II + Concerted/Cooperative Action
 7. Heaviside's dolphin (*Cephalorhynchus heavisidii*) Appendix II
 8. Humpback whale (*Megaptera novaeangliae*) Appendix I + Concerted/Cooperative Action
 9. Killer whale / Orca (*Orcinus orca*) Appendix II
 10. Peale's dolphin / Black-chinned dolphin (*Lagenorhynchus australis*) Appendix II + Concerted/Cooperative Action
 11. Sei whale (*Balaenoptera borealis*) Appendix I/II + Concerted/Cooperative Action
 12. Southern right whale (*Eubalaena australis*) Appendix I + Concerted/Cooperative Action
 13. Sperm whale (*Physeter macrocephalus*) Appendix I/II + Concerted/Cooperative Action

429. The historical discussion of these species within CMS indicates that the development of a regional Action Plan or agreement for these species is a priority.

In the period 2012-2017 (from COP10 to COP12)

430. The Secretariat and the Scientific Council should:
- a. investigate an arrangement with WHMSI to deliver a regional Action Plan, or agreement for these species; and
 - b. develop an active collaboration agreement with relevant RFMOs, including IATTC with the objective of measurably reducing cetacean bycatch.
431. The AMWG should:

- a. provide support to the region and collaborate with WHMSI, especially with assessing and developing mitigation measures for the region's bycatch and marine bushmeat issues; and
- b. develop comprehensive reports on regional progress of the CMS Global Programme of Work for Cetaceans for COP11 and COP12.

In the period 2017-2024 (from COP12 to COP14)

432. The AMWG should:
- a. provide support to the region and collaborate with WHMSI, especially with assessing and developing mitigation measures for the region's bycatch and marine bushmeat issues; and
 - b. develop comprehensive reports on regional progress of the CMS Global Programme of Work for Cetaceans for COP13 and COP14.

Central and North West Pacific Ocean (East and South East Asia) actions

433. Central and North West Pacific Ocean collaborative action to address entanglement and bycatch and whaling and other directed hunts (other impediments to migration), pollution and habitat and feeding ground degradation are weighted as high priorities; ship strikes and marine noise as medium priorities; climate change as lower (Section II).

434. 19 species and populations are listed on the CMS Appendices for this region, and these are
1. Australian snubfin dolphin (*Orcaella heinsohni*) Appendix II
 2. Baird's beaked whale (*Berardius bairdii*) Appendix II
 3. Blue whale (*Balaenoptera musculus*) Appendix I + Concerted/Cooperative Action
 4. Bryde's whale (*Balaenoptera edeni*) Appendix II
 5. Dall's porpoise (*Phocoenoides dalli*) Appendix II
 6. Fin whale (*Balaenoptera physalus*) Appendix I/II + Concerted/Cooperative Action
 7. Finless porpoise (*Neophocaena phocaenoides*) Appendix II + Concerted/Cooperative Action
 8. Fraser's dolphin (*Lagenodelphis hosei*) Appendix II+ Concerted/Cooperative
 9. Humpback whale (*Megaptera novaeangliae*) Appendix I + Concerted/Cooperative Action
 10. Indo-Pacific bottlenose dolphin (*Tursiops aduncus*) Appendix II + Concerted/Cooperative
 11. Indo-Pacific humpback dolphin (*Sousa chinensis*) Appendix II + Concerted/Cooperative Action
 12. Irrawaddy dolphin (*Orcaella brevirostris*) Appendix I/II + Concerted/Cooperative Action
 13. Killer whale / Orca (*Orcinus orca*) Appendix II
 14. North Pacific right whale (*Eubalaena japonica*) Appendix I
 15. Omura's whale (*Balaenoptera omurai*) Appendix II
 16. Pantropical spotted dolphin (*Stenella attenuata*) Appendix II + Concerted/Cooperative Action
 17. Sei whale (*Balaenoptera borealis*) Appendix I/II + Concerted/Cooperative Action
 18. Sperm whale (*Physeter macrocephalus*) Appendix I/II + Concerted/Cooperative Action
 19. Spinner dolphin (*Stenella longirostris*) Appendix II + Concerted/Cooperative Action

435. The historical discussions of these species within CMS, as well as *Recommendation 7.4: Regional Coordination for Small Cetaceans and Dugong in Southeast Asian and Adjacent Waters*, and subsequent CMS COP decisions maintaining this priority, including *Resolution 8.5: Implementation of Existing Agreements and Development of Future Agreements* and *Resolution 9.2 Priorities for CMS Agreements* indicates that the development of a regional agreement for these cetaceans in Southeast Asia is a priority.

In the period 2012-2017 (from COP10 to COP12)

436. The Secretariat and the Scientific Council should:
- a. develop greater cooperation and collaboration with an appropriate body within ASEAN (Association of Southeast Asian Nations)
 - b. negotiate a regional agreement for cetaceans in South East Asia; and
 - c. develop an active collaboration agreement with relevant RFMOs, including the Western and Central Pacific Fisheries Commission (WCPFC) with the objective of measurably reducing cetacean bycatch;
437. The AMWG should:
- a. provide support to the region, especially with assessing and developing mitigation measures for the region's bycatch, whaling, identifying critical habitat for protection and defining appropriate standards for noise pollution; and

- b. develop comprehensive reports on regional progress of the CMS Global Programme of Work for Cetaceans for COP11 and COP12.

In the period 2017-2024 (from COP12 to COP14)

438. The AMWG should:
- a. provide support to the region, especially with assessing and developing mitigation measures for the region's bycatch, whaling, identifying critical habitat for protection and defining appropriate standards for noise pollution; and
 - b. develop comprehensive reports on regional progress of the CMS Global Programme of Work for Cetaceans for COP13 and COP14.

Pacific Islands Region actions

439. In the Pacific Islands Region collaborative action to address entanglement and bycatch and habitat and feeding ground degradation are weighted as high priorities; climate change, pollution, marine bushmeat (other impediments to migration) as medium priorities; ship strikes and marine noise as lower (Section II).

440. 12 species and populations are listed on the CMS Appendices for this region, and these are:
1. Australian snubfin dolphin (*Orcaella heinsohni*) Appendix II
 2. Blue whale (*Balaenoptera musculus*) Appendix I + Concerted/Cooperative Action
 3. Bryde's whale (*Balaenoptera edeni*) Appendix II
 4. Dusky dolphin (*Lagenorhynchus obscurus*) Appendix II + Concerted/Cooperative Action
 5. Fin whale (*Balaenoptera physalus*) Appendix I/II + Concerted/Cooperative Action
 6. Humpback whale (*Megaptera novaeangliae*) Appendix I + Concerted/Cooperative Action
 7. Indo-Pacific humpback dolphin (*Sousa chinensis*) Appendix II + Concerted/Cooperative Action
 8. Killer whale / Orca (*Orcinus orca*) Appendix II
 9. Omura's whale (*Balaenoptera omurai*) Appendix II
 10. Pantropical spotted dolphin (*Stenella attenuata*) Appendix II + Concerted/Cooperative Action
 11. Sei whale (*Balaenoptera borealis*) Appendix I/II + Concerted/Cooperative Action
 12. Sperm whale (*Physeter macrocephalus*) Appendix I/II + Concerted/Cooperative Action

441. The Pacific Cetaceans MOU exists across the whole of this region, including the high seas and covers all cetaceans within the region. Strong collaboration with SPREP exists and should be maintained. Pacific Cetaceans MOU Signatories have established a forward programme of work, which requires a commitment of monetary support (Sections III, IV and V). This should be considered a priority by the CMS Parties.

In the period 2012-2017 (from COP10 to COP12)

442. The Secretariat and the Scientific Council should:
- a. develop an active collaboration agreement with relevant RFMOs, including IATTC, the Commission for the Conservation of Southern Bluefin Tuna (CCSBT) and WCPFC with the objective of measurably reducing cetacean bycatch;

443. The AMWG should:
- a. provide support to the Pacific Cetaceans MOU, especially with assessing and developing mitigation measures for the region bycatch and marine bushmeat, identifying critical habitat for protection; and
 - b. develop comprehensive reports on regional progress of the CMS Global Programme of Work for Cetaceans for COP11 and COP12.

In the period 2017-2024 (from COP12 to COP14)

444. The AMWG should:
- a. provide support to the Pacific Cetaceans MOU, especially with assessing and developing mitigation measures for the region bycatch and marine bushmeat, identifying critical habitat for protection; and
 - b. develop comprehensive reports on regional progress of the CMS Global Programme of Work for Cetaceans for COP13 and COP14.

Indian Ocean actions

445. In the Indian Ocean (including the Red Sea) collaborative action to address entanglement and bycatch, pollution, marine bushmeat habitat and feeding ground degradation are weighted as high priorities; climate change is weighted as a medium priority; ship strikes and marine noise as lower (Section II).

446. 14 species and populations are listed on the CMS Appendices for this region, and these are:
1. Blue whale (*Balaenoptera musculus*) Appendix I + Concerted/Cooperative Action
 2. Bryde's whale (*Balaenoptera edeni*) Appendix II
 3. Dusky dolphin (*Lagenorhynchus obscurus*) Appendix II + Concerted/Cooperative Action
 4. Fin whale (*Balaenoptera physalus*) Appendix I/II + Concerted/Cooperative Action
 5. Finless porpoise (*Neophocaena phocaenoides*) Appendix II + Concerted/Cooperative Action
 6. Ganges River dolphin / Susu (*Platanista gangetica gangetica*) Appendix I/II + Concerted/Cooperative Action
 7. Humpback whale (*Megaptera novaeangliae*) Appendix I + Concerted/Cooperative Action
 8. Indo-Pacific humpback dolphin (*Sousa chinensis*) Appendix II + Concerted/Cooperative Action
 9. Irrawaddy dolphin (*Orcaella brevirostris*) Appendix I/II + Concerted/Cooperative Action
 10. Killer whale / Orca (*Orcinus orca*) Appendix II
 11. Omura's whale (*Balaenoptera omurai*) Appendix II
 12. Sei whale (*Balaenoptera borealis*) Appendix I/II + Concerted/Cooperative Action
 13. Southern right whale (*Eubalaena australis*) Appendix I + Concerted/Cooperative Action
 14. Sperm whale (*Physeter macrocephalus*) Appendix I/II + Concerted/Cooperative Action

447. The historical discussion of these species within CMS, as well as *Resolution 9.2 Priorities for CMS Agreements* indicates that the development of a regional Action Plan or agreement for these cetaceans in South Asia/Indian Ocean is a priority.

In the period 2012-2017 (from COP10 to COP12)

448. The Secretariat and the Scientific Council should:
- a. facilitate a regional meeting between CMS, the Nairobi Convention, ROMPE and PERSGA to develop a forward strategy for the conservation of cetaceans in the Indian Ocean;
 - b. develop an active collaboration agreement with relevant RFMOs, PERSGA and the Indian Ocean Tuna Commission (IOTC) with the objective of measurably reducing cetacean bycatch;
449. The AMWG should:
- a. provide support to the region, especially with assessing and developing mitigation measures for the region bycatch and marine bushmeat, identifying critical habitat for protection; and
 - b. develop comprehensive reports on regional progress of the CMS Global Programme of Work for Cetaceans for COP11 and COP12.

In the period 2017-2024 (from COP12 to COP14)

450. The AMWG should:
- a. provide support to the region, especially with assessing and developing mitigation measures for the region bycatch and marine bushmeat, identifying critical habitat for protection; and
 - b. develop comprehensive reports on regional progress of the CMS Global Programme of Work for Cetaceans for COP13 and COP14.

Arctic Seas actions

451. In the Arctic Seas climate change, habitat and feeding ground degradation, marine noise and hunting (other impediments to migration) are weighted as high priorities; entanglement and bycatch and pollution as medium priorities; ship strikes as lower (Section II).

452. Five species and populations are listed on the CMS Appendices for this region, and these are:
- a. Beluga / White whale (*Delphinapterus leucas*) Appendix II
 - b. Bowhead whale (*Balaena mysticetus*) Appendix I
 - c. Killer whale / Orca (*Orcinus orca*) Appendix II
 - d. Narwhal (*Monodon monoceros*) Appendix II
 - e. Northern bottlenose whale (*Hyperoodon ampullatus*) Appendix II

In the period 2012-2017 (from COP10 to COP12)

453. The AMWG should:
- a. provide support to the region, especially scientific and technical advice to assist CMS Parties introduce adaptation measures to counteract the effects of climate change on migratory species, whaling, identifying critical habitat for protection and defining appropriate standards for noise pollution; and
 - b. develop comprehensive reports on regional progress of the CMS Global Programme of Work for Cetaceans for COP11 and COP12.

In the period 2017-2024 (from COP12 to COP14)

454. The AMWG should:
- a. provide support to the region, especially scientific and technical advice to assist CMS Parties introduce adaptation measures to counteract the effects of climate change on migratory species, whaling, identifying critical habitat for protection and defining appropriate standards for noise pollution; and
 - b. develop comprehensive reports on regional progress of the CMS Global Programme of Work for Cetaceans for COP13 and COP14.

Southern Ocean and Antarctic Seas actions

455. In the Southern Ocean climate change, habitat and feeding ground degradation and whaling (other impediments to migration) are weighted as high priorities; entanglement and bycatch, pollution as medium priorities; ship strikes and marine noise as lower (Section II).

456. Nine species and populations are listed on the CMS Appendices for this region, and these are:
1. Antarctic minke whale (*Balaenoptera bonaerensis*) Appendix II
 2. Blue whale (*Balaenoptera musculus*) Appendix I + Concerted/Cooperative Action
 3. Humpback whale (*Megaptera novaeangliae*) Appendix I + Concerted/Cooperative Action
 4. Killer whale / Orca (*Orcinus orca*) Appendix II
 5. Pygmy right whale (*Caperea marginata*) Appendix II
 6. Sei whale (*Balaenoptera borealis*) Appendix I/II + Concerted/Cooperative Action
 7. Southern right whale (*Eubalaena australis*) Appendix I + Concerted/Cooperative Action
 8. Spectacled porpoise (*Phocoena dioptrica*) Appendix II + Concerted/Cooperative Action
 9. Sperm whale (*Physeter macrocephalus*) Appendix I/II + Concerted/Cooperative Action

In the period 2012-2017 (from COP10 to COP12)

457. The Secretariat and the Scientific Council should:
- a. develop an active collaboration agreement with Commission for the Conservation of Antarctic Marine Living Resources (CCAMLR);

458. The AMWG should:
- a. provide support to the region, especially scientific and technical advice to assist CMS Parties introduce adaptation measures to counteract the effects of climate change on migratory species, whaling and identifying critical habitat for protection; and
 - b. develop comprehensive reports on regional progress of the CMS Global Programme of Work for Cetaceans for COP11 and COP12.

In the period 2017-2024 (from COP12 to COP14)

459. The AMWG should:
- a. provide support to the region, especially scientific and technical advice to assist CMS Parties introduce adaptation measures to counteract the effects of climate change on migratory species, whaling and identifying critical habitat for protection; and
 - b. develop comprehensive reports on regional progress of the CMS Global Programme of Work for Cetaceans for COP13 and COP14.

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