Convention on the Conservation of Migratory Species of Wild Animals

Secretariat provided by the United Nations Environment Programme

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WESTERN **A**FRICAN **T**ALKS ON **C**ETACEANS AND THEIR **H**ABITATS
Adeje, Tenerife, Spain, 16-20 October 2007

Draft Proposals for the Amendment of the CMS Appendices
(Stenella clymene, Sousa teuszii, Phocoena phocoena)

Note by the Secretariat

Reproduced under this cover are three draft proposals for the amendment of CMS Appendices concerning

- the West African (eastern tropical Atlantic) population of Clymene dolphin *Stenella clymene*;
- the Atlantic humpback dolphin *Sousa teuszii*;
- the Northwest African population of the harbour porpoise *Phocoena phocoena*.

The draft proposals have been submitted for preliminary consideration to the 14th Meeting of the CMS Scientific Council (Bonn, 14-17 March 2007), which has endorsed them.

The proposals are made available at the present meeting as information documents on the status and conservation needs of the species/populations concerned.

Convention on the Conservation of Migratory Species of Wild Animals
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14th MEETING OF THE CMS SCIENTIFIC COUNCIL

Bonn, Germany, 14-17 March 2007

CMS/ScC14/Doc.5
Agenda item 6(a)

CONSERVATION STATUS OF THE CLYMENE DOLPHIN IN WEST AFRICA

(*Prepared by Dr. Koen Van Waerebeek and submitted by Dr. William Perrin*)

Background

1. Since the first individual of Clymene dolphin was collected in West Africa in 1956, the total number of specimens known to science has remained less than ten for half a century, with only a very few sightings (Robineau *et al.*, 1994; Fertl *et al*. 2003; Weir, 2006). This population although considered rare was not known to be under any particular anthropogenic pressure. Recently, the UNEP/CMS-sponsored WAFCET-3 project in Ghana and Togo, implemented in close collaboration with the Department of Oceanography and Fisheries, University of Ghana at Legon, revealed frequent small cetacean bycatches in Ghana's coastal, especially drift gillnet, fisheries.

Distribution and status

2. At least 35 freshly dead, bycaught Clymene dolphins were photographed in two artisanal fish landing sites, despite the relatively small scale of the monitoring effort (P.K.Ofori-Danson *et al.* unpublished data). Bearing in mind that cetacean bycatches remain largely unreported in West Africa (Debrah, 2000; Van Waerebeek and Ofori-Danson, 1999; Van Waerebeek *et al*., 2000, 2003), such magnitude of confirmed fisheries-caused mortality of Clymene dolphins at a local level should be reason of great concern for its sustainability region-wide. Also, since Maigret (1981, 1994) underlined the lack of information on dolphin bycatches in industrial tuna purse-seine fisheries in the Gulf of Guinea, there still appears to exist no system for independent, transparent monitoring (Van Waerebeek *et al*., 2000) and incidental mortality remains unverified.

3. Information on population structure of Clymene dolphin is lacking, but distinct western and eastern Atlantic populations are likely considering an apparent low density area in far offshore waters (only two offshore records exist from mid-Atlantic waters - Perrin *et al*., 1981). For the eastern Atlantic neither relative density nor absolute abundance estimates are at hand for *S. clymene*. The relative scarcity of records indicates that it may not be very abundant, at least in coastal waters. Further, from the size of one population in the Gulf of Mexico estimated at about 2,300 individuals (Jefferson, 2002), we know that abundance there is very low compared to other pelagic *Stenella* spp. populations which more typically range in the tens or hundreds of thousands of animals. Finally, schools of Clymene dolphin also tend to be appreciably smaller than those of

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other *Stenella* spp. and even then are often mixed with other species (Perrin and Mead, 1994). Culik (2004) mentioned a school consisting of ca. 50 individuals. Two recent sightings, one off Congo and another off Angola were of groups estimated at more than 250 individuals, but the latter was a mixed school with *Delphinus* sp. (Weir, 2006), and these were the only Clymene dolphin sightings in the course of comprehensive survey effort.

Conclusion

4. Although periodic movements and migrations have not been studied, the Clymene dolphin is likely to cover great distances on a daily basis, suggesting a wide home-range (Culik, 2004) that may straddle several countries' waters. Also, when occurring in international waters, *S. clymene* should be expected to repeatedly move in and out of EEZ boundaries. The West African Clymene dolphin can therefore safely be considered a CMS migratory species population. The new evidence of ongoing bycatches requires conservation action, including better legal instruments and measures applicable in the field. Further research on exploitation levels and the species' biology, preferably by West African scientists in close collaboration with Fisheries and Wildlife departments of Range States, is urgently required.

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DRAFT PROPOSAL FOR INCLUSION OF SPECIES ON THE APPENDICES OF THE CONVENTION ON THE CONSERVATION OF MIGRATORY SPECIES OF WILD ANIMALS

A. PROPOSAL: Include the West African (eastern tropical Atlantic) population of Clymene dolphin *Stenella clymene* on CMS Appendix II.

B. PROPONENT: [a known Range State would be recommended]

C. SUPPORTING STATEMENT

1. Taxon

1.1	**Classis**	Mammalia
1.2	**Ordo**	Cetacea
1.3	**Familia**	Delphinidae
1.4	**Genus, species**	*Stenella clymene* (Gray, 1846)
1.5	**Common names**	E: Clymene dolphin F: Dauphin Clymène ES: Delfín clymene DE: Clymene-Delphin POR: Golfinho-Fiandeiro-de-Bico-Curto

2. Biological data

2.1 Distribution (current and historical)

The Clymene dolphin *Stenella clymene* inhabits the tropical, subtropical and occasionally the warm temperate waters of both the North and South Atlantic Oceans (Perrin *et al.*, 1981; Perrin and Mead, 1994; Fertl *et al*. 2003). It can be expected to occur along the eastern seaboard of the United States, throughout the Gulf of Mexico and Caribbean, along the north-eastern coast of South America, throughout the Equatorial Atlantic and along the entire tropical coast of West Africa (Perrin and Mead, 1994); however, for the latter two areas this is partially inferred. In the western Atlantic the northernmost record is from New Jersey, USA, at 39°17'N, 074°35'W and the southernmost from southern Brazil at 29°18'S,049°42'W (Perrin and Mead, 1994; Simões-Lopes *et al.*, 1994; Fertl *et al*. 2003). In the eastern Atlantic, the northernmost known distribution is from a stranding north of Nouakchott at *ca.* 19°N (Robineau *et al.*, 1994), while the southernmost occurrence is from a recent sighting off northern Angola at 06°26'S,11°25'E (Weir, 2006).

In the eastern tropical Atlantic, the species is confirmed only from eight countries (see below) from some twenty possible coastal range states; it is recorded from five NW African states, one in the Gulf of Guinea and two in the SE Atlantic. The southern distribution boundary is likely to be near the border of Angola with Namibia where the influence of the cold north-flowing Benguela Current starts being felt. It does not occur in South African waters (Ross, 1984).

There is little understanding of range usage in *S. clymene*, for example whether it uses distinctive parts of its range for feeding, reproduction and resting, but taking related pelagic delphinids as a guide, the determining factor of area usage is likely to be prey distribution. Possible shifts in distribution over time, particularly in the eastern Atlantic, cannot be evaluated considering the general scarcity of records.

2.2 Population (estimates and trends)

There is no abundance estimate that covers the entire western Atlantic Ocean. Jefferson (1996) in a survey conducted in the north-western Gulf of Mexico from 1992 to 1993 estimated the local population of *S. clymene* at about 2,300 individuals. This is a very small number compared to other pelagic *Stenella* spp. population sizes that more typically range in the tens or hundreds of thousands. For the eastern Atlantic neither relative density nor absolute abundance estimates are at hand. The relative scarcity of records of this species indicates that it may not be very abundant, at least in coastal waters. Also, schools of this species consist of less than a few hundred animals (Perrin and Mead, 1994) and generally count less than 50 (Jefferson *et al.*, 1993). Again, such school sizes tend to be appreciably smaller than those of other *Stenella* spp. and even then are often mixed with other species (Perrin and Mead, 1994). Two recent sightings, one off Congo and another off Angola were of groups estimated at more than 250 individuals, but the latter was a mixed school with *Delphinus* sp. (Weir, 2006). Culik (2004) mentioned a school from an unspecified location off West Africa consisting of approximately 50 individuals.

To date, verified published records number only about nine for the eastern tropical Atlantic (Robineau *et al.*, 1994; Fertl *et al.*, 2003; Van Waerebeek *et al.*, 2000; Van Waerebeek and Ofori-Danson, 1999). However, thanks to periodical monitoring of fish landing sites in Ghana in 2000-2003 (Debrah, 2000; K. Van Waerebeek, J. Debrah and P.K Ofori-Danson, unpublished data), at least 35 individuals have been photographed on two landing beaches.

Information on population structure is lacking, but a working hypothesis of distinct western and eastern Atlantic populations of Clymene dolphin seems reasonable considering an apparent low density area in far offshore waters. Only two offshore records exist from mid-Atlantic waters (Perrin *et al.*, 1981).

2.3 Habitat (short description and trends)

The Clymene dolphin appears to be a deep-water species inhabiting waters of 250-5,000m over and seaward of the continental shelf edge (Perrin and Mead, 1994; Fertl *et al.*, 2003; Moreno *et al.*, 2005; Weir, 2006). However, it seems extremely rare in mid-Atlantic waters. It is yet unclear whether the species may occasionally go inside the shelf edge and penetrate neritic waters in any part of its range in the eastern Atlantic. Feeding on schooling fish has been observed during daytime in the Gulf of Mexico in water of 1,243m depth (Fertl *et al.*, 1997). However, overall very little is known of the Clymene dolphin's ecology and natural history.

2.4 Migrations (kinds of movement, distance, proportion of the population migrating.

Periodic movements and migrations have not been studied. However this is a dolphin that may cover great distances on a daily basis, suggesting a wide home-range (Culik, 2004) that may straddle several countries' waters. Also, when occurring in international waters, *S. clymene* should be expected to repeatedly move in and out of EEZ boundaries.

3 Threat data

3.1 Direct threat to the population (factors, intensity)

The species is caught 'incidentally in nets throughout most parts of the range ("in particular, West Africa"; Jefferson, 2002). The first documented record of a captured specimen was from Keta, Ghana, in 1956 (Van Waerebeek and Ofori-Danson, 1999). Another was captured south of the Saloum delta in Senegal in 1957 (Cadenat and Doutre, 1958). It took another half a century before further captures were reported, the main reason being that hardly any fisheries in West Africa are surveyed for small cetacean bycatches. Even where carcases of captured dolphins are landed openly, this harvest is not registered.

For decades the commercial tuna fishery industry has contended that only negligible numbers of dolphins are killed in purse-seine sets in the Atlantic, unlike in the Pacific Ocean. Cort (1991) indicated that vessel logbooks for 10,989 purse-seine sets on tuna by the FIS fleet (France, Ivory coast, Senegal) in 1976-1982, reported that only 144 (1.3%) were made in association with dolphins. However, this being an example of the fishery industry policing itself, such claims are highly suspect. Informal interviews with fishing vessel captains (Maigret, 1981; K. Van Waerebeek, personal observations) suggest that this association is common, and that dolphins and birds are used as guides to locate tuna, much as in the Pacific. That purse-seiners in the eastern tropical Atlantic do not regularly set on dolphins is far from authenticated satisfactorily.

Limited monitoring of cetaceans landed by artisanal fisheries started in Ghana circa 1998 (Van Waerebeek and Ofori-Danson, 1999; Debrah, 2000). These fisheries, employing mostly large-mesh drift gillnets but also smaller-scale purse-seines, target several species of tuna and shark, sailfish (*Istiophorus platypterus*), wahoo (*Acanthocybium solanderi*) and swordfish (*Xiphias gladius*) amongst many other species including small cetaceans. Photographic evidence demonstrated that Clymene dolphins are taken with frequency in these fisheries, mostly in drift gillnets but possibly also in purse-seines. In 2000-2003, at least 35 Clymene dolphins were photographed at two fish landing beaches, Dixcove and Apam, before being cut up and sold for human consumption. Additional voucher material in the form of 15 dolphin heads was gathered and the skulls deposited at the University of Ghana. Several of these were gleaned from individuals different from the photographed carcases. The number documented is believed to be a vast underestimate of true mortality as many landed dolphins cannot be identified to species for lack of (diagnostic) voucher photos and because monitoring coverage was limited relative to national fishing effort. Much of the raw field data still await analysis (J. Debrah, P.K. Ofori-Danson and K. Van Waerebeek, unpublished data).

Serious concern follows from the knowledge that similar fisheries are operating off many of West Africa's coasts, with the very real probability that in other areas where *S. clymene* occurs similar numbers die from gillnet entanglement, unmonitored. Ghana, like Senegal, has a strong maritime tradition and fishermen from Ghana have 'colonised' vast stretches of Atlantic Africa's coasts, from Mauritania south to Congo, bringing their fishing techniques with them, as well as introducing new target species (Maigret, 1994; K. Van Waerebeek, pers. observations). Landed small cetaceans, although a local commercial product like any other, are not tallied or reported by national fisheries observers, nor are they otherwise documented unless a specific research programme operates. If current fisheries-caused mortality of *S. clymene* (or of any other small cetacean) region-wide would be unsustainable, under the present conditions likelihood of detection of such status would be remote.

Similarly, since Maigret (1981, 1994) underlined the lack of information on dolphin bycatches in industrial tuna purse-seine fisheries in the Gulf of Guinea, there still appears to exist no system for independent, transparent monitoring (Van Waerebeek *et al*., 2000) and incidental mortality remains unverified. Mortality of *Stenella* spp., including Clymene dolphin, may be significant.

3.2 Habitat destruction (quality of changes, quantity of loss)

Little specific information of habitat destruction is available, except that over-fishing and (foreign) pirate fishing are serious and widespread problems in most of western Africa. Trawl surveys conducted in the Gulf of Guinea since 1977 and other regional stock assessments estimate that fish biomass in nearshore and offshore waters has declined by at least 50% (e.g. Brashares *et al.*, 2004). Such dramatically reduced prey availability could have significant negative consequences on the average health of a population and its recruitment potential.

3.3 Indirect threat (e.g. reduction of breeding success by pesticide contamination)

There is no information on indirect threats, but this is more likely due to a shortage of sustained programmes of field research that might uncover and scrutinize such threats and not to a lack of these. There has been essentially no work on environmental contaminants in this species (Jefferson, 2002; Culik, 2004). A limited pilot study of heavy metal contamination in Ghana dolphins, including *S. clymene,* is underway at the University of Cape Coast (Prof. J. Debrah, pers. comm. to K.Van Waerebeek, December 2006).

3.4 Threat connected especially with migrations

No such threats have been researched. However, it is thought that fast moving, travelling or migrating schools of Clymene dolphins may be particularly vulnerable to accidental net entanglement in drift gillnets which render wide swathes of sea surface waters very dangerous for dolphins.

3.5 National and international utilization

With a few known exceptions where the consumption of cetacean meat is taboo (e.g. by Ewe people in Ghana), low to significant levels of dolphin meat consumption take place in many fishermen societies and communities in West Africa. In Ghana, dolphin meat is typically processed and sold, smoked, alongside large fishes such as tuna and sharks (Debrah, 2000). It is reportedly also marketed far into the hinterland. There are no indications of international trade in small cetacean products, but no investigation has been implemented to verify this.

4 Protection status and needs

4.1 National protection status

Dolphins are legally protected by national legislation and fisheries decrees in most West African countries; however, these laws are rarely enforced (Jefferson *et al.*, 1997; Debrah, 2000; Van Waerebeek *et al.* 2000, 2003). In Ghana, carcases of dolphins directly taken (harpooned and unreturned live-netted) are mingled with genuine accidental bycatches; none are tallied for official statistics. Dolphins and other marine mammals are protected under the Wildlife Conservation Regulation 1971 (Legislative Instrument 685). However, a confusing situation in which the Fisheries Department cannot see their way clear in implementing a provision which comes under wildlife (Game and Wildlife Department) (Debrah, 2000) complicates enforcement. This also explains why an otherwise authoritative study that showed a significant correlation between fish supply (from FAO-compiled data) and bushmeat hunting in Ghana (Brashares *et al.*, 2004) failed

to even notice the existence of the important trade in 'marine bushmeat' from some 16 species of small cetaceans (Van Waerebeek, Ofori-Danson, Debrah, in preparation) as well as sea turtles (Fretey, 2001).

4.2 International protection status

The Clymene dolphin is listed as "Data Deficient" by IUCN and is listed under Appendix II of CITES. It is currently not listed by CMS. Culik (2004) recommended the entire species for inclusion on CMS Appendix II.

4.3 Additional protection needs

Monitoring of fisheries for bycatch of cetaceans by trained observers is needed. Some countries, although operating a large network of fisheries observers in all important ports and fish landing sites, do not request information on cetacean bycatches. So, while the capacity is in place, there still exists a lack of awareness about the importance of gathering cetacean (and sea turtle) catch statistics.

5. Range States in West Africa (east Atlantic stock)

Confirmed range states: Mauritania, Senegal, The Gambia, Ghana, Congo and Angola.
Presumed range states: Guinea, Guinea-Bissau, Sierra Leone, Liberia, Côte d'Ivoire (Ivory Coast), Togo, Benin, Nigeria, Cameroun, Gabon, Democratic Republic of Congo, Sao Tomé and Principe

6. Comments from Range States

7. Additional remarks

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14th MEETING OF THE CMS SCIENTIFIC COUNCIL

Bonn, Germany, 14-17 March 2007

CMS/ScC14/Doc.6
Agenda item 6(a)

CONSERVATION STATUS OF THE ATLANTIC HUMPBACK DOLPHIN, A COMPROMISED FUTURE?

(*Prepared by Dr. Koen Van Waerebeek and submitted by Dr. William Perrin*)

Background

1. Of all cetaceans occurring in tropical and subtropical waters of West African, the Atlantic humpback dolphin is the only endemic species. It is also the cetacean that lives nearest to shore year-round, often just beyond the surf, and thus comes in closest contact with humans and their activities. It is also one of the species that displays the greatest wariness towards humans. If approached, it will flee even small boats, evidencing its great sensitivity to the lightest of disturbances. Recognizing this especially vulnerable situation, the species has since 1991 been assigned to CMS Appendix II. Since then coastal development and degradation has continued to increase region-wide (e.g. Khan and Mikkola, 2002) and pressure on the dolphin's habitat can only have risen. Moreover, despite improved search effort, sightings remain scarce. One of the aims of the CMS/UNEP-sponsored WAFCET-2 project, implemented in Senegal and The Gambia (and to a lesser degree in Guinea-Bissau), consisted of comprehensively evaluating the current status of the Atlantic humpback dolphin (Van Waerebeek *et al.*, 2003, 2004).

Distribution and populations

2. Intraspecific geographic variation in morphology and molecular genetics of *S. teuszii* has not been studied. However, for practical and conservation purposes Van Waerebeek *et al.* (2004) provisionally designated eight biogeographically defined management stocks, seven of which are known to be extant, comparable to the IWC management units for large whales where biological stock data are absent or deficient (Donovan, 1991). Documented habitats include: Dahkla Bay (Rio de Oro-Western Sahara), Banc d'Arguin (Mauritania), Saloum-Niumi (Senegal-The Gambia), Canal do Gêba-Bijagos Archipelago (Guinea-Bissau), southern Guinea, Gabon and Angola. An 8th, historical stock, the Cameroon Estuary (where the holotype was collected in 1892), remains hypothetical. Potential existence of a 9th management stock of the western Togo/Volta delta requires investigation. At least some of these are expected to have biological population status; notably, the three northernmost stocks seem relatively isolated, possibly a recent phenomenon following local extirpation of communities in between as the result of mounting human pressure. Some other stocks may coalesce into single biological populations with further knowledge. While a quasi-continuous distribution from Rio de Oro south to Angola

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may have existed historically, indications of contemporary distribution gaps are emerging, presumably the result of sustained bycatches and creeping human encroachment on once desolated coasts. It has never been considered a common species.

Abundance

3. No abundance estimates for *S. teuszii* are available from any area, but density is certainly low compared with that of widely distributed, oceanic delphinids. The above-mentioned stocks are thought to amount to at most hundreds, not thousands, of animals. For example, the Banc d'Arguin stock, which arguably enjoys the best protection due to the size of the PNBA Marine Reserve, its remoteness and the fact that no engine-powered craft are allowed, was suggested not to exceed more than 100 individuals (Maigret, 1980). A more recent guess had put it 'at least at high hundreds'. However a recent 3-day survey covering 226nmiles on effort in excellent conditions made 11 sightings of common bottlenose dolphins but did not encounter Atlantic humpback dolphin (Van Waerebeek and Jiddou, 2006). This suggests that the species may have become, or has remained (Maigret, 1980) quite rare, even under optimal circumstances. A guesstimate of "not more than 100 animals" was also cited for the Saloum Delta population (Maigret, 1980) and based on own observations of the Saloum-Niumi stock since 1997, it appears highly unlikely that abundance could exceed the low hundreds. The Canal do Gêba and Bijagos Archipelago in Guinea-Bissau may host one of the healthiest extant stocks, perhaps several hundreds. Nothing can be said about the Guinea-Conakry and Angola stocks, except that they are extant. Groups seen off southern Angola were small, less than ten individuals, off Gabon three groups ranged from 6-35 individuals (Collins *et al.,* 2004). No meaningful guesses can be made for Cameroon, Togo, and intermediate areas, nor for any other West African country (Van Waerebeek *et al*., 2004).

Captures

4. The majority of specimens archived in collections are derived from dolphins taken either incidentally or directly in small-scale coastal fisheries. However, the true extent of fisheries-related mortality in range states is thought to be considerably higher than these few opportunistic findings suggest, considering that capture reporting is next to nonexistent. Based on specimens recovered and well-documented steep increases in artisanal fishing effort (e.g., Khan and Nikkola, 2002), incidental mortality from net entanglements may be one of the most important threats to the species' survival and one of the hardest to address. The species lives in an area of high human population growth and protein food deficit, so there is potential for fisheries for human consumption (Klinowska, 1991). Their nearshore habits make them readily accessible targets.

Habitat deterioration

5. The Atlantic humpback dolphin is a very shy species. All possible forms of coastal development with accompanying disturbance and degradation known to occur in West Africa (see Khan and Mikkola, 2002) will directly or indirectly affect the species. These include, but are not limited to, over-exploitation of mangroves, coastal construction (harbours, residences, refineries, shipyards), aquaculture, oil and gas exploration and extraction (drilling), accidental spills, increased shipping, tourism, and effluents (domestic, agricultural, chemical). Vast fisheries effort,

both artisanal and industrial, exploiting neritic fish stocks (e.g. Deme, 1996) is thought to cause a significant impact. Reduced foraging success may hamper recovery from high bycatch mortality.

Conclusion

6. IUCN's Cetacean Specialist Group appropriately tagged *S. teuszii* as a high priority for research and conservation because of its restricted range, narrow ecological niche, generally low abundance, and continuing threats (Reeves *et al.*, 2003). Most of what we know about the Atlantic humpback dolphin is sketchy, uncertain or unconfirmed except regarding the trend of the status of its habitat. For the foreseeable future, accelerated development of West Africa's coastal areas and concomitant progressive deterioration as a viable biotope for a human-averse cetacean is not only certain, it is also tragically inevitable in a region with strong human demographic growth. Ecologically challenged by its high evolutionary adaptation to a very narrow niche of warm, shallow inshore waters, this dolphin species will have nowhere to turn. For the Atlantic humpback dolphin to have a genuine chance to survive the 21th century it will need all possible protective measures including, to start with, the maximum achievable legal protection.

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DRAFT PROPOSAL FOR INCLUSION OF SPECIES ON THE APPENDICES OF THE CONVENTION ON THE CONSERVATION OF MIGRATORY SPECIES OF WILD ANIMALS

A. PROPOSAL: Include the Atlantic humpback dolphin *Sousa teuszii* (Kükenthal 1892) on CMS Appendix I.

B. PROPONENT: [preferably a known range state].

C. SUPPORTING STATEMENT

1. Taxon

1.1	**Classis**	Mammalia
1.2	**Ordo**	Cetacea
1.3	**Familia**	Delphinidae
1.4	**Genus, species**	*Sousa teuszii* (Kükenthal 1892)
1.5	**Common names**	E: Atlantic Humpback Dolphin F: Dauphin à bosse Atlantique DE: Kamerun-Flußdelphin SP: Delfín jorobado del Atlantico POR: Golfinho-corcundo-do-Atlântico

2. Biological data

2.1 Distribution (current and historical)

The Atlantic humpback dolphin is a small delphinid regionally endemic to the tropical and subtropical eastern Atlantic nearshore waters of West Africa (Culik, 2002; Jefferson *et al*.). Its status was recently and comprehensively reviewed as part of the CMS/UNEP Wafcet-2 project (Van Waerebeek *et al.*, 2003, 2004). *S. teuszii* was described in 1892 from a carcass found in Cameroon. Second and third specimens were collected respectively in 1925 and 1943 in Senegal. Next it was sighted south of Conakry, Guinea, in 1953. Over the next half-century it was encountered in Dakhla Bay (Rio de Oro/Western Sahara), Banc d'Arguin (Mauritania), Siné-Saloum delta (Senegal), Niumi National Park (The Gambia), Canal do Gêba-Bijagos (Guinea-Bissau), southern Guinea, Gabon Estuary and finally in southern Angola, but it has never been considered a common species (Beaubrun, 1990; Robineau and Vely, 1998; Van Waerebeek et al., 2003; Collins *et al*., 2004).

Some authors have argued for a largely discontinuous distribution (Maigret, 1980; Ross *et al.*, 1994; Van Waerebeek *et al.*, 2000), while others indicated a more or less continuous coastal range from Dakhla Bay or Senegal to Cameroon (Dupuy, 1983; Klinowska, 1991; Rice, 1998; Jefferson *et al*., 1993) which is possible but theoretical. The information on the presence or absence of Atlantic humpback dolphins is incomplete due to a paucity of field survey effort. While a quasi-continuous distribution may have existed historically, indications of contemporary distribution gaps are emerging, presumably the result of sustained bycatches and creeping human encroachment on once desolated coasts.

2.2 Population (estimates and trends)

Population identity

Intraspecific geographic variation in morphology and molecular genetics of *S. teuszii* has not been studied. The samples required for biological population assessments are currently lacking. However, for practical and conservation purposes Van Waerebeek *et al.* (2004) provisionally designated eight management stocks, comparable to the biogeographically defined IWC management units for large whales where biological stock data are absent or deficient (Donovan, 1991). In the definition of the seven confirmed extant stocks, guidance was taken from sightings and specimens clustered around a documented habitat, i.e. from north to south, Dahkla Bay, Banc d'Arguin, Saloum-Niumi, Canal do Gêba-Bijagos, South Guinea, Gabon and Angola. The species holotype was collected from near the port of Douala, Cameroon. The species was never again reported from this country, thus an 8th stock remains hypothetical. Potential existence of a 9th management stock, western Togo/Volta delta, requires investigation. Although no firm claims of biological population status can be made here for any of these management stocks, at least some are expected to acquire such status with further research. Notably, the three northernmost stocks (Dahkla Bay, Banc d'Arguin, Saloum-Niumi) are thought to be relatively restricted in terms of gene flow, possibly a recent phenomenon following local extinctions of communities in-between as the result of mounting human pressure. Some other stocks may coalesce into single biological populations.

Abundance

No abundance estimates for *S. teuszii* are available from any area, but density is certainly low compared with that of widely distributed, oceanic delphinids. The above-mentioned stocks are thought to amount to at most hundreds, not thousands, of animals. Some estimation of relative density can be gained as follows. The northernmost community, Dahkla Bay, is smallest by any definition. In four sightings, the aggregated total number observed was 28 dolphins, and some of these may have been resightings (Notarbartolo di Sciara *et al*., 1998). The Banc d'Arguin stock was suggested not to exceed more than 100 individuals (Maigret, 1980). A more recent guess puts it 'at least at high hundreds' (Alex Aguilar, pers. comm., cited *in* Van Waerebeek *et al.*, 2004). However a 2006 survey of PNBA waters sighted many (11 sightings) common bottlenose dolphins *Tursiops truncatus* but did not encounter a single Atlantic humpback dolphin in 226nmiles (27h 59min) of survey effort (Van Waerebeek and Jiddou, 2006), which suggests that humpback dolphins may have become, or have remained (Maigret, 1980) quite rare. A guesstimate of "not more than 100 animals" was also cited for the Saloum Delta population by Maigret (1980), while Mitchell (1975a) stated that for coastal waters of southern Senegal "it is rather common" (p. 910). Based on observations of the Saloum-Niumi stock since 1997, it appears highly unlikely that abundance could exceed the low hundreds. From Spaans (1990) and Powell *et al.* (1996), and more recent sightings, it follows that at least until 1998 the species was not uncommon in the waters of Canal do Gêba and Bijagos Archipelago in Guinea-Bissau; and that may be one of the healthiest extant stocks. Nothing can be said about the Guinea-Conakry and Angola stocks, except that recent records have confirmed their existence, but groups seen off southern Angola were small, less than ten individuals. Off Gabon three groups ranged from 6-35 individuals (Collins *et al.,* 2004). No meaningful guesses can be made for Cameroon, Togo, nor for any other West African country.

Fisheries monitoring in western Ghana (Debrah, 2000; Van Waerebeek and Ofori-Danson, 1999; Ofori-Danson *et al.,* unpublished data) documented hundreds of landed delphinids taken in coastal fisheries, none *S. teuszii*. Atlantic humpback dolphins, if not entirely absent, must be very

rare west of Tema, central Ghana. The void may extend west several hundreds of kilometers into Ivory Coast, for there are no reports from there. The absence may be due to local extirpation after decades of high levels of bycatches, if not directed harvest.

In the absence of scientific abundance estimates, unknown recruitment, population structure, and trends, combined with a lack of understanding of local threats, adherence to the precautionary principle seems advised.

2.3 Habitat (short description and trends)

No offshore sightings have been reported. Atlantic humpback dolphins inhabit predominantly tropical coastal and estuarine habitat with soft-sediment bottoms. In the Saloum Delta and Niumi National Park it is seen nearshore within 100-200 m from the beach. Also, off southern Angola and in Gabon, animals were sighted within a short distance from shore. A young individual was taken alive in a beach-seine near Joal in 1955 (Van Waerebeek *et al.*, 2003, 2004; Collins *et al.,* 2004).

Tolerance for variable salinity levels seems high and includes both the brackish water of large estuaries and highly saline waters such as found in the Saloum Delta during the dry season (Van Waerebeek *et al*., 2000). Although *S. teuszii* has repeatedly been suggested to also occupy riverine habitat (Dupuy, 1983; Jefferson *et al.*, 1993; Klinowska, 1991; Powell et al., 1996), there is no evidence for that. There are no positive records from the fresh water biotope, beyond seawater intrusion of rising tides in estuaries. This is a relevant difference with *Sousa chinensis*, for instance, which does occasionally occur in riverine habitat.
Claims of sightings of *S. teuszii* in the Niger, Senegal, and Casamance Rivers (Klinowska, 1991) are unsupported. Interestingly, common bottlenose dolphins are confirmed to penetrate considerably upstream with rising tide in the Casamance and Gambia Rivers and may have been mistaken for Atlantic humpback dolphins (Van Waerebeek *et al.*, 2003, 2004).

2.4 Migrations (kinds of movement, distance, proportion of the population migrating.

Populations or communities that straddle two nations almost certainly move between them with high frequency. For instance, cross-border movements between Senegal's Saloum Delta and The Gambia's Niumi National Park were observed on several instances, and the Saloum-Niumi is considered a single stock (Van Waerebeek *et al.*, 2004). Some movements between Saloum-Niumi and the Bijagos Archipelago (Guinea-Bissau) are also expected, considering the relatively limited distance (*ca*. 280 km) and very suitable coastal habitat in-between.

Unpublished and published observations from October through March (Cadenat, 1959), a sighting in April (Cadenat, 1959), and a capture off Joal in August point to a year-round presence in Saloum-Niumi (Maigret, 1977).

Maigret (1980) suggested a possible seasonal movement between Banc d'Arguin (Mauritania) and the Saloum Delta (Senegal). However, there is no evidence of seasonality in occurrence in either area, nor any observations that would point to regular long-distance seasonal movements between the suggested 'home ranges'. Perhaps more probable would be that some season-dependent movements occur around one particular stock's core area.

3 Threat data

3.1 Direct threat to the population (factors, intensity)

Bycatches
The majority of specimens archived in collections are derived from dolphins taken either incidentally or directly in small-scale coastal fisheries. The only specimen record from Rio de Oro/Western Sahara was a carcass found entangled in an octopus line in 1996. Imragen fishermen of Mauritania were photographed in 1967 cutting up an animal reported 'stranded' (Busnel, 1973). However, being fresh it was most probably a dolphin by-caught in nets. Another animal killed in a gillnet at Ile Arguin in 1995 was eaten by local fishermen. At least five individuals from Senegal have come from bycatches in shark gill nets in the period 1955-1956 (Cadenat 1956a, 1957; Cadenat and Paraiso, 1957).

In November 1996, three carcasses of *S. teuszii* were found together on uninhabited (sacred) Sangomar Island with nylon rope knotted around the tailstocks of two animals. They were abandoned on the island presumably for animist-religious reasons (Van Waerebeek *et al.*, 1997). The only known specimens from Guinea-Bissau and Guinea died in a fishing trap in 1989 (Sequeira and Reiner, 1992) and an unidentified fishing device in 2003, respectively (Van Waerebeek *et al.,* 2004).

Importantly, the true extent of fisheries-related mortality in all range states is expected to be considerably higher than these few opportunistic findings suggest, as reporting is next to nonexistent. Based on specimens recovered and well-documented steep increases in artisanal fishing effort (e.g., Khan and Nikkola, 2002), incidental mortality may be the most important threat to the species' survival and one of the hardest to address (Van Waerebeek, 2003).

Directed catches
The species lives in an area of high human population growth and protein food deficit, so there is potential for fisheries for human consumption (Klinowska, 1991). The nearshore habits of Atlantic humpback dolphins make them readily accessible targets. Specific accounts of directed takes are scarce but they are believed to occur with some regularity. A female taken alive in a beach seine near Joal in 1955 was not returned (Cadenat, 1956a). The fishers communities of Joal, Fadiouth, M'Bour and some others along Senegal's Petite Côte, have long been known to harpoon dolphins until at least 1996 (Cadenat, 1947, 1956b; Van Waerebeek et al., 1997), including humpback dolphins of the Saloum-Niumi population. The illegality of the practice induces fishermen to hide all evidence, which they do efficiently, so estimates of numbers taken are elusive. Butcher remains are either discarded at sea, used as bait, or buried on the beach (Van Waerebeek *et al*., 1997, 2000).

3.2 Habitat destruction (quality of changes, quantity of loss)

The Atlantic humpback dolphin is a shy species; when approached by boat it will flee. All possible forms of coastal development with accompanying disturbance and degradation known to occur in West Africa (see Khan and Mikkola, 2002) will directly or indirectly affect the species. These include, but are not limited to, over-exploitation of mangroves, coastal construction (harbours, residences, refineries, shipyards), aquaculture, oil and gas exploration and extraction (drilling), accidental spills, increased shipping, tourism, and effluents (domestic, agricultural, chemical). Huge fisheries effort exploiting neritic fish stocks, both artisanal and industrial (e.g. Armah *et al.*, 1996; Deme, 1996; Khan and Mikkola, 2002), including on both known prey

species of *S. teuszii*, are thought to cause a major impact. Reduced foraging success may hamper recovery from high bycatch mortality.

3.3 Indirect threat (e.g. reduction of breeding success by pesticide contamination)
No dedicated research has been initiated and therefore no specific information is available on such indirect threats, but, as indicated above, the exclusive nearshore habits of Atlantic humpback dolphin would give it the dubious distinction of being West Africa's cetacean most likely to receive the most severe impact.

3.4 Threat connected especially with migrations
There are no known threats different from the ones outlined above.

3.5 National and international utilization

4 Protection status and needs

4.1 National protection status
No specific legislation seems to exist that protects Atlantic humpback dolphin. However, all small cetaceans are formally protected by national legislation in Senegal, The Gambia, Mauritania, Ghana, Benin and Togo, and presumably in several more range states. Nonetheless, in practice, bycatches of small cetaceans in fisheries, even if systematic and predictable, or even somehow directed or assisted (e.g. live-caught animals not being returned), are not being monitored.

4.2 International protection status
Recognizing its vulnerable situation, the Atlantic humpback dolphin has since 1991 been assigned to CMS Appendix II. Since then coastal degradation has vastly increased region-wide (e.g. Khan and Mikkola, 2002) and pressure on this species can only have risen. Despite much increased search effort, sightings remain scarce. CITES in recognition of its vulnerable situation bans all international commercial trade (Appendix I). IUCN considers the species 'Data Deficient'.
For the species to survive, *S. teuszii* will need the maximum possible legal and other protection, considering its low abundance, threatened habitat, suspected fragmentation of distribution range, unknown natural history and low prospects for efficient monitoring of stock status.

4.3 Additional protection needs
Cetaceans should be added to the template of reporting forms used to gather national statistics on landings of marine biological resources. It is recommended that fisheries observers receive some basic training as to improve the quality of reporting. Although most fishermen will hide cetacean bycatches for fear of sanctions, some bycatches are openly landed and could be documented. Considering the poor state of knowledge on this species, even isolated cases may provide useful information.

5. Range States of Atlantic humpback dolphin

Confirmed range states:
Mauritania, Senegal, The Gambia, Guinea-Bissau, Guinea, Cameroon, Gabon and Angola. (Western Sahara)
Possible range states: Ghana and Togo

6. Comments from Range States

7. Additional remarks

While distribution historically may have been quasi-continuous over the species' range, indications of contemporary distribution gaps are emerging. Precise documentation of present-day distribution and baseline abundance data need to be obtained. To start with, for several coastal nations, simple information on whether or not they are range states should be gotten. Other research priorities include assessment of the levels of gene-flow between the eight defined management stocks, the collection of carcasses and biological samples and the study of behavioural ecology. The IUCN CSG (Cetacean Specialist Group) appropriately tagged *S. teuszii* as a high priority for research and conservation because of its restricted range, narrow ecological niche, generally low abundance, and continuing threats (Reeves *et al.*, 2003).

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Convention on the Conservation of Migratory Species of Wild Animals
Secretariat provided by the United Nations Environment Programme

14th MEETING OF THE CMS SCIENTIFIC COUNCIL

Bonn, Germany, 14-17 March 2007

CMS/ScC14/Doc.7
Agenda item 6(a)

CONSERVATION STATUS OF THE NORTHWEST AFRICAN POPULATION OF THE HARBOUR PORPOISE

(*Prepared by Dr. Koen Van Waerebeek and submitted by Dr. William Perrin*)

Background

1. The harbour porpoise is a mammal perhaps not readily associated with Africa, but continental shelf waters off its northwestern coast are habitat for the southernmost occurring population of the species. This marginal distribution has left the NW African stock largely at the fringe of scientific and conservation focus, despite the harbour porpoise being one of the best studied odontocetes at a global level, often profiled as a flagship species for marine conservation efforts. Indications are that the NW population is small. With the NW African shelf waters amongst the most heavily fished areas in the world (e.g. see Zeeberg *et al.,* 2006), concern is that if the population would be significantly depleted, chances that it would be detected in time to install drastic conservation measures are minimal.

Distribution, population identity, status

2. Harbour porpoises typically occupy neritic habitat and rarely venture far beyond the continental shelf, although some individuals have been found in deep water (Read *et al.*, 1996). The NW Africa population ranges from Agadir, Morocco, south to Joal-Fadiouth (14°09'N, 16°49'W), Senegal (Robineau and Vely, 1998; Van Waerebeek *et al.*, 2000, 2003). Support for population discreteness consists of an apparent distribution gap of some 895km from Cabo de Espichel, southern Portugal over the Strait of Gibraltar south to Agadir. Smeenk *et al.* (1992) showed that harbour porpoises from West African, on average, may have a larger body size than those from Denmark. A sample of 5 porpoises from Mauritania did not share any mt-DNA haplotypes with other *P. phocoena* stocks in the NE Atlantic (Tolley and Rosel, 2006). The main caveat with these studies is that all sample sizes are small.

3. The new southernmost range is significant in that it demonstrates that the species' range bypasses the Cap Vert Peninsula, often considered the southern limit for the influence of the cool Canary Current, by some 100km. South from Joal-Fadiouth, the marine environment becomes increasingly warm and unfit for harbour porpoises. The species has not been confirmed from The Gambia.

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4. No abundance estimates are available for the NW African population. Reports of both sightings and specimens are infrequent, suggesting that the species is not abundant, especially off Morocco. Indications, both from sightings and available specimens, are that within this range harbour porpoises are most common off northern Mauritania (Robineau and Vely, 1998), where off Cap Blanc it moves back and forth across national borders, probably on a diurnal basis.

Threats

5. The International Whaling Commission (1996) noted a severe bycatch problem for the species as a whole. In areas where adequate data on abundance and by-catch levels exist, incidental mortality exceeds sustainable levels. Naturally, the principal threat to the NW African population is thought to be interactions with fisheries, and specifically net entanglements, considering the very intensive fishing effort in the shelf waters (e.g. Pauly *et al.* 1998; Mahmoud Cherif, 2001; Zeeberg *et al.*, 2006). Although annual bycatch mortality cannot be estimated with the current poor documentation record, harbour porpoises have been incidentally captured in Senegal and Mauritania with some regularity for many decades (e.g. Cadenat, 1949; Fraser, 1958; Maigret, 1994; Van Waerebeek *et al.*, 2000). Much less is known about bycatches in Morocco and Western Sahara. The norm in the region is that cetacean bycatches are clandestinely processed where fishers fear fines or other sanctions (Van Waerebeek *et al.*, 2000). In terms of habitat degradation, over-fishing off NW Africa is thought to be highly disruptive of the shelf ecosystem. Depleted fish stocks and intense maritime traffic have the potential to reduce foraging efficiency of the porpoises.

Conclusion

6. A high degree of reproductive isolation for NW African harbour porpoises, a largely 'forgotten' population, is practically certain. The lack of abundance estimates and the poor insight on spatial and temporal distribution allow only a most superficial assessment, and no potential to evaluate trends. Coupled to well-established anthropogenic threats, the case for a strong precautionary conservation approach cannot be more evident. One such measure is reinforcing legal protection, the reason why it is proposed below to place this population on CMS Appendix II. Doing so would stimulate a second urgent measure: implementation of dedicated research, including regular visual and acoustic surveys and population studies with adequate samples in order to establish a firm baseline from which to evaluate future trends.

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DRAFT PROPOSAL FOR INCLUSION OF SPECIES ON THE APPENDICES OF THE CONVENTION ON THE CONSERVATION OF MIGRATORY SPECIES OF WILD ANIMALS

A. PROPOSAL: Include the NorthWest African population of the harbour porpoise *Phocoena phocoena* on Appendix II.

B. PROPONENT: [Preferably a range state of the population].

C. SUPPORTING STATEMENT

1. Taxon

1.1	**Classis**	Mammalia
1.2	**Ordo**	Cetacea
1.3	**Familia**	Phocoenidae
1.4	**Genus, species**	*Phocoena phocoena* (Linnaeus, 1758)
1.5	**Common names**	E: Harbour porpoise F: Marsouin commun ES: Marsopa común DE: Schweinswal

2. Biological data

2.1 Distribution (current and historical)

Harbour porpoises are widely distributed in temperate to subpolar shallow waters in the Northern Hemisphere. This proposal relates to the NW African population, which is considered discrete (see below) from the geographically closest Iberia population and Black Sea subspecies *P. phocoena relicta* Abel, 1905. Distributional support for discreteness consists of an apparent distribution gap from Cabo de Espichel (38°25'N, 09°12'W), southern Portugal (Culik, 2004) over the Strait of Gibraltar south to Agadir, central coast of Morocco, some 895km. No evidence exists of normal occurrence in the western Mediterranean and Strait of Gibraltar now or in the past. A single confirmed record from the western Mediterranean, near Malaga, Spain (Frantzis *et al.*, 2001) was probably a vagrant. This absence is all the more striking considering the fact that harbour porpoises are relatively common and are present year-round along the Atlantic coast of the Iberian Peninsula (Sequeira, 1996).

The NW Africa population ranges from Agadir (30°25'N,09°36'W) (Bayed and Beaubrun, 1987; Robineau and Vely, 1998) south to Joal-Fadiouth (14°09'N,16°49'W) (Van Waerebeek *et al.*, 2000, 2003). This new southernmost range south to Senegal's Petite Côte is significant in that it demonstrates that the species' range bypasses the Cap Vert Peninsula (Dakar) by some 100km. The peninsula is often considered the southern limit for the influence of the cool Canary Current. Cadenat (1956) reported that several porpoises were taken off Hann, near Dakar, and Bathurst (the former name for Banjul, The Gambia) at 13°27'S. While only about 70km farther SE of Joal-Fadiouth, records at the boundary of a known range, more than any others, require substantiation. The fact remains that despite field work no *P. phocoena* have been documented from The Gambia (Van Waerebeek *et al.*, 2000, 2003; Jallow *et al*., 2005). South from Joal-Fadiouth, waters are

increasingly dominated by the warm Guinea Current and the habitat becomes unfit for harbour porpoises. A vague reference to a case in Guinea, in March (Cadenat, 1957) is not credible. It must be noted that probably accurate distinctions between small cetacean species (and in particular porpoises) by knowledgeable locals such as fishermen can be lost in translation when reported in French or English.

2.2 Population (estimates and trends)

Population identity

While Fraser (1958) found no significant cranial differences between harbour porpoises from Senegal and those from Britain, his sample was small and included immature specimens. Mostly distributional arguments led several authors to consider NW African harbour porpoises as a discrete population (Gaskin, 1984; Donovan and Bjørge, 1995). Smeenk *et al.* (1992) suggested that porpoises from West Africa, on average, have a larger body size than those from Denmark. Although their analysis was rather weak, results were consistent with the apparent Strait of Gibraltar/northern Morocco distribution gap. A recent study added further evidence in showing that five porpoises from Mauritania did not share any mt-DNA haplotypes with any other *P. phocoena* stock in the NE Atlantic and contiguous seas (Tolley and Rosel, 2006). A high degree of reproductive isolation now appears practically certain.

Abundance

No abundance estimates are available for the NW African population (see Read, 1999; Culik, 2004). Reports of both sightings and specimens are infrequent, suggesting that the species is not abundant, especially off Morocco where porpoises are considered rare (Aloncle, 1967; Duguy, 1976). No porpoises were encountered off the Rio de Oro/Western Sahara coast during a 750km survey in the Bay of Dakhla and the Bay of Cintra, nor in-between (Notarbartolo di Sciara *et al.*, 1998). Additional effort is desirable, however, considering that visual surveys of *P. phocoena* are very sensitive to sea conditions, with harbour porpoises easily missed in anything more than Beaufort 2-3 seas.

Indications, both from sightings and the number of available specimens, are that within this range harbour porpoises are most common off northern Mauritania (Smeenk *et al.,* 1992; Robineau and Vély, 1998) and especially around the Cap Blanc Peninsula, i.e. east in the Baie du Lévrier (Smeenk *et al.*, 1992) and west and south off Cap Blanc (Van Waerebeek and Jiddou, 2006). In a 3-day survey of waters in and adjacent to the Parc National du Banc d'Arguin (PNBA) in November 2006, five sightings were made. All involved loose aggregations composed of 2-14 (mode, 3) apparently feeding porpoises, either west or southwest off Cap Blanc. The overall encounter rate for the 3-day survey (226nm, 27h59min on effort) was 0.022 groups/nmile surveyed or 0.217 porpoises/nmile (Van Waerebeek and Jiddou, 2006). No porpoises were seen in the shallow waters of the Banc d'Arguin (PNBA), although sighting effort was much higher there, supporting earlier findings that porpoises avoid the Banc d'Arguin proper (Smeenk *et al.*, 1992; Robineau and Vely, 1998).

Recent inspection of two main collections in Mauritania, in an effort to set up a national database, revealed three and five cranial specimens, curated respectively at IMROP and PNBA (Van Waerebeek and Jiddou, 2006). At Dakar's IFAN institute, ten skulls are deposited, seven from Senegal and three from Mauritania (Van Waerebeek *et al.*, 2000). Skulls at other collections still require verification. With less than 10 specimen records and no documented sightings from Senegal, the species is considered uncommon. None were encountered during cetacean coastal

work in Senegal in 1995-97 (Van Waerebeek *et al.,* 1997). Surveys, preferably combined visual and acoustic, are needed in all range states.

2.3 Habitat (short description and trends)

Harbour porpoises typically occupy neritic habitat and rarely venture far beyond the continental shelf (Read, 1999; Culik, 2004), although some individuals have been found in deep water (Read *et al.*, 1996). Off NW Africa, the harbour porpoise, adapted to temperate waters, appears closely associated with the cool Canary Current flowing south along the NW African coasts down to about the Cap Vert Peninsula, coinciding with the approximate southern range of the species (Smeenk *et al*., 1992; Robineau and Vely, 1998; Van Waerebeek *et al.*, 2000; 2003). Off Cap Blanc, Mauritania, porpoises seem to be linked to strong local upwelling, rip curls and eddies, the result of unusually strong currents off the peninsula's headland. Independently moving individuals, with non-directional high-speed swimming bursts and encountered in a very loose association (Van Waerebeek and Jiddou, 2006) seem consistent with individual feeding behaviour of harbour porpoises (Read, 1999). This species is known to prey on small, schooling clupeoid and gadid fishes. In some, but not all, areas their prey is found near the sea floor (Read, 1999).

2.4 Migrations (kinds of movement, distance, proportion of the population migrating

There is no evidence that supports or rejects possible long-range movements of *P. phocoena* off NW Africa. Read and Westgate (1997) found harbour porpoises in Canada to be extremely mobile and capable of covering large distances in relatively short periods. From satellite tagging data, mean daily distances in the Bay of Fundy ranged between 14-58 km, and home ranges may encompass tens of thousands of km² (Read and Westgate, 1997). The porpoise community present off Cap Blanc (20°44'N,17°03'W) moves freely between Mauritania and Rio de Oro waters; in fact, as the international border bisects the Cap Blanc Peninsula, daily cross-border movements are a virtual certainty (Van Waerebeek and Jiddou, 2006).

3 Threat data

3.1 Direct threat to the population (factors, intensity)

Bycatches

Although few cases have been documented in any detail, the principal threat to the West African population is thought to be accidental net entanglements, considering the very intensive coastal fishing effort in range states (e.g. Maigret, 1994; Zeeberg *et al.*, 2006). The International Whaling Commission (1996) noted the problem for the species as a whole, and in areas where adequate data on abundance and by-catch levels exist, incidental mortality exceeds sustainable levels.

Harbour porpoises have been captured in Senegal with some regularity for many decades (e.g. Fraser, 1958). A first bycatch was reported in 1949 off Hann when two harbour porpoises were taken in nets, but then such catches were considered rare (Cadenat, 1949). Cadenat (1957) reported that several harbour porpoises had been taken off Hann, near Dakar, and Banjul, The Gambia. However, there is concern about correct identification where reports were second-hand. In the 1990s, harbour porpoises were taken by the artisanal lobster fishery in the northern border areas of Mauritania. Several of the collection specimens from Mauritania are thought to originate from fisheries' victims. Maigret (1994) estimated bycatch 'at less than 20 per year', but he added 'the population is thought to be small along the northwestern African coasts'. A total of 51 stranded specimens were reported for Mauritania (Robineau and Vely, 1998) however the fraction due to bycatches was not estimated.

In 1999-2001, three captures of harbour porpoise were recorded on Senegal's Petite Côte (Van Waerebeek *et al.*, 2003), all were apparently landed at Joal-Fadiouth, but one was butchered in nearby Tidine. Overall, cetacean bycatches are rarely reported in Senegal because fishermen fear fines or other sanctions.

Directed catches
Duguy (1976) indicated that from verbal information gathered in 1968 harpooning of porpoises ('marsouins') was relatively frequent in that period, on board fishing boats working these waters [i.e. Senegal, Mauritania, Rio de Oro]. However, as pointed out before, the term 'marsouins' as used by locals may have referred to delphinids. Harbour porpoises avoid boats and are very hard to approach. It is doubted that they could be harpooned on a regular basis, unless netted or shot first (Van Waerebeek *et al*., 2000).

While there are no substantiated incidents, porpoises that survive entanglement are unlikely to be released.

3.2 Habitat destruction (quality of changes, quantity of loss)
Over-fishing is probably the most important damage inflicted on the marine habitat off Northwest Africa, as it is in many regions (e.g. Mahmoud Cherif, 2001; Brashares *et al.*, 2004; Pauly *et al.* 1998). Depleted fish stocks are thought to reduce foraging efficiency of the porpoises, forcing them to spend more time and energy to meet metabolism demands. Intensified traffic from fishing and cargo vessels may add significant disturbance, more so than for delphinids, considering the systematic avoidance behaviour seen in harbour porpoises in the face of an approaching vessel (Van Waerebeek and Jiddou, 2006).

3.3 Indirect threat (e.g. reduction of breeding success by pesticide contamination)
Wildlife in coastal areas of Mauritania is threatened by pollution from industrial developments at Nouadhibou (Shine *et al.*, 2001). Heavy metal contamination may constitute a problem for the porpoise population feeding in and adjacent to the Cap Blanc PNBA Satellite Reserve. Huge quantities of high-grade iron ore are processed on the Cap Blanc Peninsula and shipped out via the port of Nouadhibou. On windy days, clouds of iron ore dust, no doubt laden with a variety of trace elements including heavy metals, are blown over adjacent waters (Van Waerebeek, personal observations) and may find their way into the marine food web. Porpoises as an upper trophic level predator will inevitably accumulate contaminants. The risks of these anthropogenic chemicals in harbour porpoises are still little understood (e.g. Read, 1999)

3.4 Threat connected especially with migrations
There are no known threats because migrations remain unstudied.

3.5 National and international utilization

4 Protection status and needs

4.1 National protection status
Small cetaceans are formally protected by national legislation in at least Senegal and Mauritania, but there are no specific measures to protect harbour porpoises. In practice, takes of small cetaceans in foreign and domestic fisheries off West Africa, even if systematic and predictable, are not sanctioned.

In 2006, to better protect the PNBA, the World Heritage Committee of UNESCO encouraged Mauritania to implement the Marine Environment Code (MEC) in order to implement MARPOL (International Convention for the Prevention of Pollution from Ships) provisions as soon as possible.

The coastal sector called Aguerguer or Côte des Phoques of the proposed 15,000- 20,000 km^2 Parc National de Dakhla could also protect potentially important habitat of *P. phocoena*.

4.2 International protection status

The *P. phocoena* populations of the North and Baltic Seas are listed in Appendix II of CMS. The harbour porpoise is listed as 'Vulnerable' by IUCN (Black and Baltic Seas stocks are listed separately also as Vulnerable) and it is listed under Appendix II of CITES.

4.3 Additional protection needs

Much better and updated information is necessary to allow a sound protection strategy to be drafted. Cetaceans could be added to the data sheets of species to be reported on by fisheries observers and some basic training should be provided. Although most fishermen will hide cetacean bycatches to avoid sanctions (Van Waerebeek *et al.*, 2000), some are landed or transported openly and could be documented. Even isolated cases may provide useful information. The harbour porpoise community off Cap Blanc may require specific protection as it inhabits some of the most heavily fished areas in all of Mauritania.

5. Range States of West African population of harbour porpoise

Confirmed range states: Morocco, Mauritania, and Senegal. (Western Sahara).
Possible range state: The Gambia.

6. Comments from Range States

7. Additional remarks

Indications are that the Cap Blanc community of harbour porpoises may be present year-round (re observations in Robineau and Vely, 1998 and Van Waerebeek and Jiddou, 2006). Foraging porpoises stay around for hours and can easily be sighted with regular binoculars from the cliffs of the Cap Blanc PNBA Satellite Parc. Considering zero-impact on porpoises with excellent possibilities to observe the Mediterranean monk seal, the cape deserves to be added to the list of recommended sites for low-impact marine mammal ecotourism.

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