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Agenda item 6(a)

CONSERVATION STATUS OF THE CLYMENE DOLPHIN IN WEST AFRICA

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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artisanal fish landing sites, despite the relatively small scale of the monitoring effort (P.K.Ofori-Danson *et al.* unpublished data).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

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.

References

Culik, B. 2004. Review on small cetaceans. Distribution, behaviour, migration and threats. Compiled for CMS/UNEP. Marine Mammal Action Plan/ Regional Seas Reports and Studies 177. 343pp.

Debrah, J.S. 2000. Taxonomy, exploitation and conservation of dolphins in the marine waters of Ghana. Master of Philosophy thesis, Department of Oceanography and Fisheries, University of Ghana. 86pp. (unpublished).

Fertl, D., Jefferson, T.A., Moreno, I.B., Zerbini, A.N. and Mullin, K. D. 2003. Distribution of the Clymene dolphin. *Mammal Review* 33: 253-271.

Jefferson, T.A. 2002. Clymene dolphin *Stenella clymene.* Pp. 234-236. In: Encyclopedia of Marine Mammals (eds. W.F. Perrin, B. Würsig & J.G.M. Thewissen). Academic Press, San Diego.

Maigret, J. 1981. Rapports entre les cétacés et la pêche thonière dans l'Atlantique tropical oriental. *Notes Africaines* 171: 77-84.

Maigret, J. 1994. Marine mammals and fisheries along the West African coast. *Rep.Int.Whal. Commn*. (special issue 15): 307-316.

Perrin, W.F. and Mead, J.G. 1994. Clymene dolphin *Stenella clymene* (Gray, 1846). Handbook of Marine Mammals 5, The First Book of Dolphins: 161-171.

Perrin, W.F., Mitchell, E.D., Mead, J.G., Caldwell, D.K. and van Bree, P.J.H. 1981. *Stenella clymene*, a rediscovered tropical dolphin of the Atlantic. *Journal of Mammalogy* 62(3): 583-598.

Robineau, D., Vély, M. and Maigret, J. 1994. *Stenella clymene* (Cetacea, Delphinidae) from the west coast of West Africa. *Journal of Mammalogy* 75(3): 766-767.

Van Waerebeek, K., Ndiaye E., Djiba, A., Diallo, M., Murphy, P., Jallow, A., Camara, A., Ndiaye, P. and Tous, P. 2000. A survey of the conservation status of cetaceans in Senegal, The Gambia and Guinea-Bissau. UNEP/CMS Secretariat, Bonn, Germany. 80pp.

Van Waerebeek, K., Barnett, L., Camara, A., Cham, A., Diallo, M., Djiba, A., Jallow, A.O., Ndiaye, E., Samba Ould Bilal, A.O. & Bamy, I. L. 2003. Conservation of Cetaceans in The

Gambia and Senegal 1999-2001, and Status of the Atlantic humpback dolphin. WAFCET-2 Report. UNEP/CMS Secretariat, Bonn, Germany. 55 pp.
Van Waerebeek, K. and Ofori-Danson, P.K.1999. A first checklist of cetaceans of Ghana, Gulf of Guinea, and a shore-based survey of interactions with coastal fisheries. Paper SC/51/SM35, 51st Annual Meeting, IWC Scientific Committee, May 1999, Grenada. 9pp.
Weir, C.R. 2006. First confirmed records of Clymene dolphin, *Stenella clymene* (Gray, 1850), from Angola and Congo, South-East Atlantic Ocean. *African Zoology* 41(2): 297-300.

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

8. References

Brashares, J.S., Arcese, P., Sam, M.K., Coppolillo, P.B., Sinclair, A.R.E. and Balmford, A. 2004. Bushmeat hunting, wildlife declines, and fish supply in West Africa. *Science* 306, 12 November 2004: 1180-1183.

Cadenat, J. and Doutre, M. 1958. Notes sur les Delphinidés ouest-africains, I. Un *Prodelphinus*? Indéterminé des côtes du Sénégal. *Bulletin de l'IFAN* 20A: 1483-1485.

Cort, J.L. 1991. Estudio de las asociaciones de tunidos, en especial la denominada "atun-delfín". Su integración en la biología des estos peces migradores. Instituto Español de Océanografía, apartado 240, 39080 Santander, Spain. 51pp. (unpublished).

Culik, B. 2004. Review on small cetaceans. Distribution, behaviour, migration and threats. Compiled for CMS/UNEP. Marine Mammal Action Plan/ Regional Seas Reports and Studies 177. 343pp.

Debrah, J.S. 2000. Taxonomy, exploitation and conservation of dolphins in the marine waters of Ghana. Master of Philosophy thesis, Department of Oceanography and Fisheries, University of Ghana. 86pp. (unpublished).

Dupuy, A.R. and Maigret, J. 1979. Les Mammifères marins des côtes du Sénégal. 3. Observations signalés en 1978. *Bulletin de l'IFAN* 41A, (2): 429-439.

Fertl, D., Schiro, A.J., Peake, D. 1997. Coordinated feeding by Clymene dolphins (*Stenella clymene*), in the Gulf of Mexico. *Aquatic Mammals*: 111-112.

Fertl, D., Jefferson, T.A., Moreno, I.B., Zerbini, A.N. and Mullin, K. D. 2003. Distribution of the Clymene dolphin. *Mammal Review* 33: 253-271.

Fretey, J. 2001. Biogeography and conservation of marine turtles of the Atlantic Coast of Africa. CMS Technical Series Publication 6. UNEP/CMS Secretariat, Bonn, Germany. 429pp.

Jefferson, T.A. 1996. Estimates of abundance of cetaceans in offshore waters of the northwestern Gulf of Mexico, 1992-1993. *Southwest Naturalist* 41: 279-287.

Jefferson, T.A. 2002. Clymene dolphin *Stenella clymene.* Pp. 234-236. In: Encyclopedia of Marine Mammals (eds. W.F. Perrin, B. Würsig & J.G.M. Thewissen). Academic Press, San Diego.

Jefferson, T.A., Leatherwood, S. and Webber, M.A. 1993. Marine Mammals of the World. FAO Species Identification Guide. UNEP, FAO, Rome. 320pp.

Leatherwood S, Caldwell O.K, and Winn, H.E. 1976. Whales, dolphins and porpoises of the western North Atlantic. A guide to their identification. *NOAA Tech. Report NMFS Circ.* 396. 176pp.

Maigret, J. 1981. Rapports entre les cétacés et la pêche thonière dans l'Atlantique tropical oriental. *Notes Africaines* 171: 77-84.

Maigret, J. 1994. Marine mammals and fisheries along the West African coast. *Rep.Int.Whal. Commn*. (special issue 15): 307-316.

Perrin, W.F. and Mead, J.G. 1994. Clymene dolphin *Stenella clymene* (Gray, 1846). Handbook of Marine Mammals 5, The First Book of Dolphins: 161-171.

Perrin, W.F., Mitchell, E.D., Mead, J.G., Caldwell, D.K. and van Bree, P.J.H. 1981. *Stenella clymene*, a rediscovered tropical dolphin of the Atlantic. *Journal of Mammalogy* 62(3): 583-598.

Robineau, D., Vély, M. and Maigret, J. 1994. *Stenella clymene* (Cetacea, Delphinidae) from the west coast of West Africa. *Journal of Mammalogy* 75(3): 766-767.

Ross, G.J.B. 1984. The smaller cetaceans of the south east coast of southern Africa. *Ann. Cape Prov. Mus. (Nat. Hist.)* 15: 174-408.

Simões-Lopes, P.C., Praderi, R., de Souza Paula, G. 1994. The Clymene dolphin, *Stenella clymene* (Gray, 1846), in the Southwestern South Atlantic Ocean. *Marine Mammal Science* 10(2): 213-217.

Van Waerebeek, K., Ndiaye E., Djiba, A., Diallo, M., Murphy, P., Jallow, A., Camara, A., Ndiaye, P. and Tous, P. 2000. A survey of the conservation status of cetaceans in Senegal, The Gambia and Guinea-Bissau. UNEP/CMS Secretariat, Bonn, Germany. 80pp.

Van Waerebeek, K. and Ofori-Danson, P.K.1999. A first checklist of cetaceans of Ghana, Gulf of Guinea, and a shore-based survey of interactions with coastal fisheries. Paper SC/51/SM35, 51st Annual Meeting, IWC Scientific Committee, May 1999, Grenada. 9pp.

Van Waerebeek, K., Ofori-Danson, P.K. and Debrah, J. In preparation. Cetaceans of Ghana, a first checklist and a review for the Gulf of Guinea. African Journal of Marine Biology.

Weir, C.R. 2006. First confirmed records of Clymene dolphin, *Stenella clymene* (Gray, 1850), from Angola and Congo, South-East Atlantic Ocean. *African Zoology* 41(2): 297-300.